



GOVERNMENT OF ANDHRA PRADESH

**STATE BOARD OF TECHNICAL EDUCATION AND
TRAINING**

Andhra Pradesh :: AMARAVATI

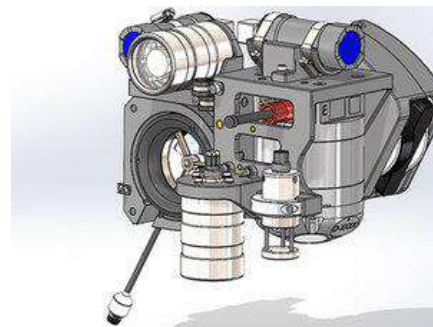


Globally Competitive

CURRICULUM (C-20)

For Polytechnic Diploma Courses

in Andhra Pradesh



3 YEAR

DIPLOMA IN

3D ANIMATION AND GRAPHICS ENGINEERING



CURRICULUM -2020

(C-20)

3 YEAR

**DIPLOMA IN 3D ANIMATION AND GRAPHICS
ENGINEERING**

**STATE BOARD OF TECHNICAL EDUCATION AND TRAINING
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CURRICULUM -2020
(C-20)
FOR DIPLOMA COURSES IN ANDHRA PRADESH CURRICULUM- C 20

PREAMBLE

The proposed programme intends to develop a skilled technician to support the industries both nationally or globally. It also helps to kindle the spirit of entrepreneurship with necessary skills and theoretical inputs aligning with the National policy of 'Make in India'. The programme also provides for accomplishing higher education goals for those who wish to enrich their theoretical concepts further.

The State Board of Technical Education and Training, (SBTET) AP, has been offering Diploma programmes to meet the above said aspirations of the stake holders: industries, students, academia, parents and the society at large. As such, it has been the practice of SBTET, A.P., to keep the curriculum abreast with the advances in technology through systematic and scientific analysis of current curriculum and bring out an updated revised version at regular intervals. Accordingly the SBTET, AP under the aegis of the Department of Technical Education, Andhra Pradesh in its 57th Board Meeting held on 05-02-2019 (vide item no: 18) resolved to update the Polytechnic Curriculum C-16 with the guidance of National Institute of Technical Teachers Training & Research (NITTTR), Extension Centre, Vijayawada (ECV), to be implemented with effect from the academic year '20-21.

Analysis of Curriculum C-16 (SWOT analysis) started in the month of June-2019. Feedback was collected from all stake holders: Students, Lecturers, Senior Lecturers, Head of Sections and Principals for all programmes for this purpose. A series of workshops with subject experts followed in the subsequent weeks and the draft curricula were prepared for every programme. Finally, an interactive session with representatives from industries, academia and subject experts was held on 04.01.2020 for thorough perusal and critique of draft curricula; and the suggestions received thus received from Industrialists and academia have been recorded, validated by another set of experienced subject teachers from the Department of Technical education for incorporation into the Curriculum C-20.

The design of new Curricula for the different diploma programmes has thus been finalised with the active participation of the members of the faculty teaching in the Polytechnics of Andhra Pradesh, and duly reviewed by Expert Committee constituted of academicians and representatives from industries. Thus, the primary objective of the curriculum change is to produce employable technicians in the country by correlating the growing needs of the industries with relevant academic input.

The outcome-based approach as given by NBA guidelines has been followed throughout the design of this curriculum is designed to meet the requirements of NBA Accreditation, too.

The revised New Curriculum i.e., Curriculum–2020 (C-20) is approved by BoG of SBTET for its implementation with effect from 2020-21.

Highlights of Curriculum C-20:

1. Duration of course for regular Diploma and for sandwich Diploma is 3 years and 3½ years respectively.
2. The Curriculum is prepared in Semester Pattern. However, First Year is maintained as Year-wise pattern.
3. 6 Months Industrial training has been introduced for 3 years Diploma Courses and 1 year Industrial Training is introduced for 3½ years Sandwich Diploma courses.
4. Updated subjects relevant to the industry are introduced in all the Diploma courses.
5. CISCO course content has been incorporated into the ECE, CME and CME Allied courses for certification from CISCO in lieu of industrial training when students are unable to get Industrial Training placement in any industry.
6. The policy decisions taken at the State and Central level with regard to environmental science are implemented by including relevant topics in Chemistry. This is also in accordance with the Supreme Court guidelines issued in Sri Mehta's case.
7. Keeping in view the increased need of communication skills which is playing a major role in the success of Diploma Level students in the Industries, emphasis is given for learning and acquiring listening, speaking, reading and writing skills in English. Further as emphasized in the meetings, Communication Skills lab and Life Skills lab are continuing for all the branches.
8. CAD specific to the branch has been given emphasis in the curriculum. Preparing drawings using CAD software has been given more importance.
9. Upon reviewing the existing C-16 curriculum, it is found that the theory content is found to have more weightage than the Practical content. In C-20 curriculum, more emphasis is given to the practical content in Laboratories and Workshops, thus strengthening the practical skills.
10. With increased emphasis for the student to acquire Practical skills, the course content in all the subjects is thoroughly reviewed and structured as outcome based than the conventional procedure based.
11. Curricula of Laboratory and Workshops have been thoroughly revised based on the suggestions received from the industry and faculty, for better utilization of the equipment available in the Polytechnics. The experiments /exercises that are chosen for the practical sessions are identified to conform to the field requirements of industry.
12. An exclusive section for assessing Higher order Thinking skills (HOTS) has been introduced in summative evaluation.

Acknowledgements:

It is pertinent to acknowledge the support of the following in the making of Curriculum C-20. A series of workshops in three phases were conducted by NITTTR, AP Extension Centre, Vijayawada involving faculty from Polytechnics, Premier Engineering Colleges & Industries to analyze the Previous C-16 Curriculum and to design C-20 Curriculum under the guidance of Dr C. R. Nagendra Rao, Professor & Head, NITTTR-ECV. The efforts & support extended by NITTTR to bring out final Curriculum C-20 by incorporating needs, aspiration & expectations of all stake holders is highly appreciated and gratefully acknowledged.

The Members of the working group are grateful to Sri M.M. Nayak, I.A.S., Special Commissioner of Technical Education & Chairman of SBTET, AP. and Sri. G. AnanthaRamu, I.A.S., Principal Secretary, Department of Skill Development and Training for their guidance and valuable inputs during process of revising, modifying and updating the Curriculum C-20.

The Members acknowledge with thanks the guidance & inspiration provided by Sri. V.S. Dutt, Secretary, SBTET, Andhra Pradesh and other officials of Directorate of Technical Education and the State Board of Technical Education, Andhra Pradesh, experts from industry, academia from the universities and

higher learning institutions and all teaching fraternity from the Polytechnics who are directly or indirectly involved in preparation of the curricula.

RULES AND REGULATIONS OF C-20 CURRICULUM

1 DURATION AND PATTERN OF THE COURSES

All the Diploma programs run at various institutions are of AICTE approved 3 years or 3½ years duration of academic instruction.

All the Diploma courses are run on year wise pattern in the first year, and the remaining two or two & half years are run in the semester pattern. In respect of few courses like Diploma in Bio-Medical course, the training will be in the seventh semester. Run-through system is adopted for all the Diploma Courses, subject to eligibility conditions.

2 PROCEDURE FOR ADMISSION INTO THE DIPLOMA COURSES:

Selection of candidates is governed by the Rules and Regulations laid down in this regard from time to time.

- a) Candidates who wish to seek admission in any of the Diploma courses will have to appear for the Common Entrance Test for admissions into Polytechnics (POLYCET) conducted by the State Board of Technical Education and Training, Andhra Pradesh, Vijayawada.
Only the candidates satisfying the following requirements will be eligible to appear for the Common Entrance Test for admissions into Polytechnics (POLYCET).
- b) The candidates seeking admission should have appeared for S.S.C examination, conducted by the Board of Secondary Education, Andhra Pradesh or equivalent examination thereto, at the time of applying for the Common Entrance Test for admissions into Polytechnics (POLYCET). In case of candidates whose results of their Qualifying Examinations is pending, their selection shall be subject to production of proof of their passing the qualifying examination in one attempt or compartmentally at the time of admission.
- c) Admissions are made based on the merit obtained in the Common Entrance Test (POLYCET) and the reservation rules stipulated by the Government of Andhra Pradesh from time to time.
- d) For admission into the following Diploma Courses for which entry qualification is 10+2, candidates need not appear for POLYCET. A separate notification will be issued for admission into these courses.
 - i). D.HMCT ii).D. Pharmacy

3 MEDIUM OF INSTRUCTION

The medium of instruction and examination shall be English.

4 PERMANENT IDENTIFICATION NUMBER (PIN)

A cumulative / academic record is to be maintained of the Marks secured in sessional work and end examination of each year for determining the eligibility for promotion etc., A Permanent Identification Number (PIN) will be allotted to each admitted candidate to maintain academic records.

5 NUMBER OF WORKING DAYS PER SEMESTER / YEAR:

- a) The Academic year for all the Courses shall be in accordance with the Academic Calendar.
- b) The Working days in a week shall be from Monday to Saturday
- c) There shall be 7 periods of 50 minutes duration each on all working days.

- d) The minimum number of working days for each semester / year shall be 90 / 180 days excluding examination days. If this prescribed minimum is not achieved due to any reason, special arrangements shall be made to conduct classes to complete the syllabus.

6 ELIGIBILITY (ATTENDANCE TO APPEAR FOR THE END EXAMINATION)

- a) A candidate shall be permitted to appear for the end examination in all subjects, if he or she has attended a minimum of 75% of working days during the year/Semester.
- b) Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester or 1st year may be granted on medical grounds.
- c) A stipulated fee shall be payable towards condonation for shortage of attendance.
- d) Candidates having less than 65% attendance shall be detained.
- e) Students whose shortage of attendance is not condoned in any semester / 1st year and not paid the condonation fee in time are not eligible to take their end examination of that class and their admissions shall stand cancelled. They may seek re-admission for that semester / 1st year when offered in the next subsequent academic semester/year.
- f) For INDUSTRIAL TRAINING:
- i) During Industrial Training the candidate shall put in a minimum of 90% attendance.
 - ii) If the student fails to secure 90% attendance during industrial training, the student shall reappear for 6 months industrial training at his own expenses.

7 READMISSION

Readmission shall be granted to eligible candidates by the respective Principal/ Regional Joint Director.

- a) (i) Within 15 days after commencement of class work in any semester (Except Industrial Training).
(ii) For Industrial Training: before commencement of the Industrial training.
- b) Within 30 days after commencement of class work in any year (including D. Pharmacy course or first year course in Engineering and Non Engineering Diploma streams).
Otherwise such cases shall not be considered for readmission for that semester / year and are advised to seek readmission in the next subsequent eligible academic year.
The percentage of attendance of the readmitted candidates shall be calculated from the first day of beginning of the regular class work for that year / Semester, as officially announced by CTE/SBTET but not from the day on which he/she has actually reported to the class work.

8 SCHEME OF Evaluation

a) First Year

THEORY Courses: Each Course carries Maximum marks of 80 with examination of 3 hours duration, along with internal assessment for Maximum of 20 marks. (Sessional marks). However, there are no minimum marks prescribed for sessionals.

Laboratory Courses: There shall be 40 Marks for internal assessment i.e. sessional marks for each practical Course with an end examination of 3 hours duration carrying 60 marks. However, there are no minimum marks prescribed for sessionals.

b) III, IV, V, VI and VII Semesters:

THEORY Courses: End semester evaluation shall be of 3 hours duration and for a maximum of 80 marks.

Laboratory Courses: Each Course carry 60/30 marks of 3hours duration 40/20 sessional marks.

9 INTERNAL ASSESSMENT SCHEME

- a) **Theory Courses:** Internal assessment shall be conducted for awarding sessional marks on the dates specified. **Threeunit tests shall be conducted for I year students and two Unit Tests for semesters.**

Internal Assessment shall be of 90 minutes duration and for a maximum of 40 marks. For each test The average of marks of all the test, reduced to 20 shall be taken as final sessional in any case.

b) **Practical Courses:**

(i) **Drawing Courses:**

The award of sessional marks for internal Assessment shall be as given in the following table

Distribution of Marks for the Internal Assessment Marks			
First Year (Total:40 Marks)		Semesters (Total:40 Marks)	
Max:20 Marks	Max:20 Marks	Max:20 Marks	Max:20 Marks
From the Average of THREE Unit Tests.	From the Average of Assessment of Regular Class work Exercises.	From the Average of TWO Unit Tests.	From the Average of Assessment of Regular Class work Exercises.

All Drawing exercises are to be filed in **serial order** and secured for further scrutiny by a competent authority

(ii) **Laboratory Courses:**

Student's performance in Laboratories / Workshop shall be assessed during the year/ semester of study for 40 marks in each practical Course.

Evaluation for Laboratory Courses, other than Drawing courses:

- i. Instruction (teaching) in laboratory courses (except for the course on Drawing) here after shall be task/competency based as delineated in the Laboratory sheets, prepared by SBTET, AP & NITTTR- ECV and posted in SBTET website.
 - ii. Internal assessment for Laboratory shall be done on the basis of task/s performed by the student as delineated in the laboratory sheets, prepared by SBTET, AP & NITTTR- ECV and posted in AP, SBTET website.
 - iii. Question paper for End semester Evaluation shall also be task/s based and shall be prepared and distributed by SBTET as done in case of theory courses be prepared as per SBTET rules in vogue.
- c) Internal assessment in Labs / workshops / Survey field work etc., during the course of study shall be done and sessional marks shall be awarded by the concerned Teacher.
- d) For practical examinations, except in drawing, there shall be two examiners. External examiner shall be appointed by the Principal in consultation with respective Head of Section preferably choosing a qualified person from in the order of preference.
- i) Nearby Industry
 - ii) Govt / Semi Govt organization like R & B, PWD, PR, Railways, BSNL, APSRTC, APSEB etc.,
 - iii) Govt / University Engg College.
 - iv) HoDs from Govt. Polytechnic

Internal examiner shall be the person concerned with internal assessment as in (c) above. The end examination shall be held along with all theory papers in respect of drawing.

- e) Question Paper for Practicals: Question paper should cover (the experiments / exercise prescribed to test various) skills like handling, manipulating, testing, trouble shooting, repair, assembling and dismantling etc., from more than one experiment / exercise
- f) Records pertaining to internal assessment marks of both theory and practical Courses are to be maintained for official inspection.
- g) **In case of Diploma programs having Industrial Training, Internal Assessment and Summative Evaluation**, shall be done as illustrated in the following table:

Assessment no	Upon completion of	By	Based on	Max Marks
1	12 weeks	1.The faculty concerned and 2. Training Mentor of the industry	Learning outcomes as given in the scheme of assessment ,for Industrial Training	120
2	20-22 weeks			120
3.Final summative Evaluation	23 week	1.The faculty member concerned, 2.HoD concerned and 3.An external examiner	1.Demonstration of any one of the skills listed in learning outcomes	30
			2.Training Report	20
			3.Viva Voce	10
TOTAL				300

10 MINIMUM PASS MARKS

THEORY EXAMINATION:

For passing a theory Course, a candidate has to secure a minimum of 35% in end examination and a combined minimum of 35% of both Sessional and end examination marks put together.

PRACTICAL EXAMINATION:

For passing a practical Course, a candidate has to secure a minimum of 50% in end examination and a combined minimum of 50% of both sessional and practical end examination marks put together. In case of D.C.C.P., the pass mark for typewriting and short hand is 45% in the end examination. There are no sessional marks for typewriting and Shorthand Courses of D.C.C.P course.

INDUSTRIAL ASSESSMENT:

Pass marks is 50% in assessment at Industry (I and II assessments put together) and also 50% in final summative assessment at institution level

11. PROVISION FOR IMPROVEMENT

Improvement is allowed only after he / she has completed all the Courses from First Year to Final semester of the Diploma.

- a) Improvement is allowed in any 4 (Four) Courses of the Diploma.

- b) The student can avail of this improvement chance **ONLY ONCE**, that too within the succeeding two examinations after the completion of Diploma. However, the duration including Improvement examination shall not exceed **FIVE** years from the year of first admission.
- c) No improvement is allowed in Practical / Lab Courses or Project work or Industrial Training assessment. However, improvement in drawing Course(s) is allowed.
- d) If improvement is not achieved, the marks obtained in previous Examinations hold good.
- e) Improvement is not allowed in respect of the candidates who are punished under Mal-practice in any Examination.
- f) Examination fee for improvement shall be paid as per the notification issued by State Board of Technical Education and Training from time to time.
- g) All the candidates who wish to appear for improvement of performance shall deposit the original Marks Memos of all the years / Semesters and also original Diploma Certificate to the Board. If there is improvement in performance of the current examination, the revised Memorandum of marks and Original Diploma Certificate will be issued, else the submitted originals will be returned.

12. RULES OF PROMOTION FROM 1ST YEAR TO 3RD, 4TH, 5TH, 6TH and 7TH SEMESTERS:

A) For Diploma Courses of 3 Years duration

- i. A candidate shall be permitted to appear for first year examination provided he / she puts in 75% attendance (which can be condoned on Medical grounds upto 10%) i.e. attendance after condonation on Medical grounds should not be less than 65% and pay the examination fee.
- ii. A candidate shall be promoted to 3rd semester if he/she puts the required percentage of attendance in the first year and pays the examination fee. A candidate who could not pay the first year examination fee has to pay the promotion fee as prescribed by State Board of Technical Education and Training, AP from time to time before commencement of 3rd semester.
- iii. A candidate shall be promoted to 4th semester provided he/she puts the required percentage of attendance in the 3rd semester and pay the examination fee. A candidate, who could not pay the 3rd semester exam fee, has to pay the promotion fee as prescribed by State Board of Technical Education and Training AP from time to time before commencement of 4th semester.

A candidate is eligible to appear for the 4th semester examination if he/she

- a) Puts the required percentage of attendance in the 4th semester
- b) Should not have failed in more than four Courses in 1st year

For IVC & ITI Lateral Entry Students:

- a) A candidate is eligible to appear for the 4th semester examination if he/she puts the required percentage of attendance in the 4th semester
- b) A candidate is eligible to appear for the 4th semester examination if he/she clears at least two Courses in third semester.
- iv) A candidate shall be promoted to 5th semester provided he / she puts the required percentage of attendance in the 4th semester and pays the examination fee. A candidate, who could not pay the 4th semester examination fee, has to pay the promotion fee as prescribed by State Board of Technical Education and Training from time to time before commencement of 5th semester.

A candidate is eligible to appear for the 5th semester examination if he/she

- a) Puts the required percentage of attendance in the 5th semester
- b) Should get eligibility to appear for 4th Semester examination.

The first backlog exam in 5th semester will be conducted only in instant/supplementary diploma examination.

For IVC& ITI Lateral Entry students:

- a) Puts the required percentage of attendance in the 5th semester
- v) A candidate shall be sent to Industrial training provided he/she puts in the required percentage of attendance in the 4th semester and pay the examination fee/ promotion fee as prescribed by SBTET.

A candidate is eligible to appear for Industrial Training assessment (Seminar/Viva-voce)

- a) Puts the required percentage of attendance, i.e., 90% in 6th semester Industrial Training

For IVC & ITI Lateral Entry students:

- a) Puts the required percentage of attendance, i.e., 90% in 6th semester Industrial Training.
- b) should get eligibility to appear for 5th Semester Examination.

B) For Diploma Courses of 3 ½ Years duration (MET/ CH/ CHPP/ CHPC/ CHOT/ TT):

- i. A candidate shall be permitted to appear for 1st year examination provided he / she puts in 75% attendance (which can be condoned on Medical grounds up to 10%) i.e. attendance after condonation on Medical grounds should not be less than 65% and pay the examination fee.
- ii. A candidate shall be promoted to 3rd semester if he/she puts the required percentage of attendance in the 1st year and pays the examination fee. A candidate who could not pay the 1st year examination fee has to pay the promotion fee as prescribed by State Board of Technical Education and Training from time to time before commencement of 3rd semester.
- iii. A candidate shall be promoted to 4th semester provided he/she puts the required percentage of attendance in the 3rd semester and pay the examination fee. A candidate, who could not pay the 3rd semester exam fee, has to pay the promotion fee as prescribed by State Board of Technical Education and Training from time to time before commencement of 4th semester.
A candidate is eligible to appear for the 4th semester exam if he/she
 - a). Puts the required percentage of attendance in the 4th semester
 - b). Should not have failed in more than Four backlog Courses of 1st year.

For IVC & ITI Lateral Entry students:

- a) Puts the required percentage of attendance in the 4th semester
- iv. A candidate shall be promoted to 5th semester industrial training provided he / she puts the required percentage of attendance in the 4th semester and pays the examination fee. A candidate, who could not pay the 4th semester examination fee, has to pay the promotion fee as prescribed by State Board of Technical Education and Training from time to time before commencement of 5th semester.
- v. Promotion from 5th to 6th semester is automatic (i.e., from 1st spell of Industrial Training to 2nd spell) provided he/she puts the required percentage of attendance, which in this case i.e., 90 % of attendance and attends for the VIVA-VOCE examination at the end of training.

- vi. A candidate shall be promoted to 7th semester provided he / she puts the required percentage of attendance in the 6th semester and pays the examination fee. A candidate, who could not pay the 6th semester examination fee, has to pay the promotion fee as prescribed by State Board of Technical Education and Training from time to time before commencement of 7th semester.
- vii. A candidate shall be promoted to 7th semester of the course provided he/she has successfully completed both the spells of Industrial Training.

A candidate is eligible to appear for 7th semester examination if he/she

- a) Puts in the required percentage of attendance in the 7th semester
- b) Should get eligibility to appear for 4th semester Examination.

For IVC & ITI Lateral Entry students:

- a) Puts in the required percentage of attendance in the 7th semester
- b) Should not have failed more than four backlog Courses of 3rd Semester

C) For Diploma Courses of 3 ½ Years duration (BM):

The same rules which are applicable for conventional courses also apply for this course. The industrial training in respect of this course is restricted to one semester (6 months) after the 6th semester (3 years) of the course.

- i. A candidate shall be permitted to appear for first year examination provided he / she puts in 75% attendance (which can be condoned on Medical grounds upto 10%) i.e. attendance after condonation on Medical grounds should not be less than 65% and pay the examination fee.
- ii. A candidate shall be promoted to 3rd semester if he/she puts the required percentage of attendance in the first year and pays the examination fee. A candidate who could not pay the first year examination fee has to pay the promotion fee as prescribed by State Board of Technical Education and Training from time to time before commencement of 3rd semester.
- iii. A candidate shall be promoted to 4th semester provided he/she puts the required percentage of attendance in the 3rd semester and pay the examination fee. A candidate who could not pay the 3rd semester examination fee, has to pay the promotion fee as prescribed by State Board of Technical Education and Training from time to time before commencement of 4th semester.

A candidate is eligible to appear for the 4th semester examination if he/she

- a) Puts in the required percentage of attendance in the 4th semester
- b) Should not have failed in more than Four backlog Courses of 1st year

For IVC & ITI Lateral Entry Students:

A candidate is eligible to appear for the 4th semester examination if he/she puts the required percentage of attendance in the 4th semester

- iv. A candidate shall be promoted to 5th semester provided he / she puts the required percentage of attendance in the 4th semester and pays the examination fee. A candidate, who could not pay the 4th semester examination fee, has to pay the promotion fee as prescribed by State Board of Technical Education and Training from time to time before commencement of 5th semester.

A candidate is eligible to appear for the 5th semester exam if he/she

- a) Puts in the required percentage of attendance in the 5th semester.
- b) Should get eligibility to appear for 4th Semester examination.

For IVC & ITI Lateral Entry students:

- a) Puts in the required percentage of attendance in the 5th semester.
- b) Should not have failed in more than Four backlog Courses of 3rd Semester.

- v. A candidate shall be promoted to 6th semester provided he/she puts in the required percentage of attendance in the 5th semester and pays the examination fee.

A candidate who could not pay the 5th semester examination fee, has to pay the promotion fee as prescribed by State Board of Technical Education and Training from time to time before commencement of 6th semester.

A candidate is eligible to appear for 6th semester examination

- a) Puts in the required percentage of attendance in 6th semester and
- b) should get eligibility to appear for 4th Semester Examination.

For IVC & ITI Lateral Entry students:

- a) Puts in the required percentage of attendance in 6th semester.
- b) Should get eligibility to appear for 5th Semester Examination.

- vi. A candidate shall be promoted to 7th semester provided he/she puts in the required percentage of attendance in 6th semester and pay the examination fee. A candidate, who could not pay the 6th semester examination fee, has to pay the promotion fee prescribed by SBTET from time to time before commencement of the 7th semester (Industrial Training).

A candidate is eligible to appear for 7th semester Industrial Training assessment (Seminar/Viva-voce) if he/she

- a) Puts in the required percentage of attendance, ie., 90% in 7th semester Industrial Training
- b) Should get eligibility to appear for 4th Semester Examination.

For IVC & ITI Lateral Entry students:

- a) Puts in the required percentage of attendance, ie., 90% in 7th semester Industrial Training.
- b) Should get eligibility to appear for 5th Semester Examination.

Important Note:

Seminar/Viva-voce should not be conducted for Not-Eligible Candidates, till the candidate gets eligibility. However, the record of internal Assessment for Industrial Training for 260 marks shall be maintained at Institution Level for all candidates and the data is to be uploaded only for eligible candidates. For not eligible candidates the data is to be uploaded as and when the candidate gets eligibility.

OTHER DETAILS

- a) In case a candidate does not successfully complete the Industrial training, he / she will have to repeat the training at his / her own cost.
- b) The First spell of Industrial training shall commence 10 days after the completion of the last theory examination of 4th Semester.
- c) The Second spell of Industrial training shall commence within 10 days after the completion of first spell of Industrial training.

13. STUDENTS PERFORMANCE EVALUATION

Successful candidates shall be awarded the Diploma under the following divisions of pass.

- a) First Class with Distinction shall be awarded to the candidates who secure an overall aggregate of 75% marks and above.

- b) First Class shall be awarded to candidates who secure overall aggregate of 60% marks and above and below 75% marks.
- c) Second Class shall be awarded to candidates who secure a pass with an overall aggregate of below 60%.
 - i. The Weightage of marks for various year/Semesters which are taken for computing overall aggregate shall be 25% of I year marks + 100% of 3rd and subsequent Semesters.
 - ii. In respect IVC & ITI Lateral Entry candidates who are admitted directly into diploma course at the 3rd semester (i.e., second year) level the aggregate of (100%) marks secured at the 3rd and subsequent semesters of study shall be taken into consideration for determining the overall percentage of marks secured by the candidates for award of class/division.
- d) Second Class shall be awarded to all students, who fail to complete the Diploma in the regular 3 years/ 3 ½ years and four subsequent examinations, from the year of first admission.

14. EXAMINATION FEE SCHEDULE:

The examination fee should be as per the notification issued by State Board of Technical Education and Training, AP from time to time.

15. STRUCTURE OF EXAMINATION QUESTION PAPER:

I. Formative assessment (Internal examination)

a) For theory Courses:

Three unit tests for first year and two unit tests for semesters shall be conducted with a duration of 90 minutes for each test for maximum marks of 40. It consists of part A and Part B.

Part A contains five questions and carries 16 marks. Among these five questions first question consists of four objective items like one word or phrase answer/filling-in the blanks/true or false etc with one mark for each question. The other four questions are short answer questions and carry three marks each.

Part B carries 24 marks and consists of three questions with internal choice i.e., Either/Or type, and each question carries 8 marks.

The sum of marks of 3 tests for I year and 2 tests for semesters shall be reduced to 20 marks in each Course for arriving at final sessional marks.

b) For drawing Courses:

For I year:

Three unit tests with duration of 90 minutes and for maximum marks of 40 marks shall be conducted for first year. It consists of part A and Part B.

Part A consists four questions for maximum marks of 16 and each question carries four marks (4×4 marks=16 marks).

Part B carries maximum marks of 24 and consists of five questions while the student shall answer any three questions out of these five questions. Each question in this part carries a maximum marks of 8, (3×8 marks=24 marks).

The sum of marks obtained in 3 unit test marks shall be reduced to 20 marks for arriving at final sessional marks. Remaining 20 marks are awarded by the Course teacher based on the student's performance during regular class exercise.

For semester: Two unit tests with duration of 90 minutes and for maximum marks of 40 marks shall be conducted. The sum of marks obtained in 2 unit test marks shall be reduced to 20 marks for arriving at

final sessional marks. Remaining 20 marks are awarded by the Course teacher based on the student's performance during regular class exercise

c) For Laboratory /workshop: 50% of total marks for the Course shall be awarded based on continuous assessment of the student in laboratory/workshop classes and the remaining 50% shall be based on the sum of the marks obtained by the students in two tests.

II. Summative assessment (End examination)

The question paper for theory examination is patterned in such a manner that the Weightage of periods/marks allotted for each of the topics for a particular Course be considered. End Examination paper is of 3 hours duration.

a) **Each theory paper consists of Section 'A', 'B' and 'C'.**

Section 'A' with Max marks of 30, contains 10 short answer questions. All questions are to be answered and each carries 3 marks, i.e., $10 \times 3 = 30$.

Section 'B' with Max marks of 40 contains 5 essay type questions including Numerical questions (without any divisions in the question), with internal choice(Either/or type), each carrying 8 marks, i.e., Max. Marks: $5 \times 8 = 40$.

Section 'C' with Max marks of 10 contains single essay type, Higher order Thinking skills question (HoTs)including Numerical questions, without choice (without any divisions in the question),

Thus the total marks for theory examination shall be: 80.

b) **For Engineering Drawing Course (107) consist of section 'A' and section 'B'.**

Section 'A' with max marks of 20, contains four (4) questions. All questions in section 'A' are to be answered to the scale and each carries 5 marks, ie. $4 \times 5=20$.

Section 'B' with max marks of 40, contains six (6) questions. The student shall answer any four (4) questions out of the above six questions and each question carries 10 Marks, ie. $4 \times 10 = 40$.

c) **Practical Examinations**

For Workshop practice and Laboratory Examinations, Each student has to pick up a question paper distributed by Lottery System.

Max. Marks for an experiment / exercise : 50

Max. Marks for VIVA-VOCE : 10

Total Max. Marks : 60

In case of practical examinations with 50 marks, the marks shall be distributed as

Max. Marks for an experiment / exercise : 25

Max. Marks for VIVA-VOCE : 05

Total Max. Marks : 30

In case of any change in the pattern of question paper, the same shall be informed sufficiently in advance to the candidates.

d) **Note: Evaluation for Laboratory Courses, other than Drawing courses:**

- I. Instruction (teaching) in laboratory courses (except for the course on Drawing) hereafter shall be task/competency based as delineated in the Laboratory sheets, prepared by SBTET, AP and posted in its website.

- II. Internal assessment for Laboratory shall be done on basis of task/s performed by the student as delineated in the laboratory sheets, prepared by SBTET, AP and posted in its website.
- III. Question paper for End semester Evaluation shall be prepared as per SBTET rules in vogue.

16. ISSUE OF MEMORANDUM OF MARKS

All candidates who appear for the end examination will be issued memorandum of marks without any payment of fee. However candidates who lose the original memorandum of marks have to pay the prescribed fee to the Secretary, State Board of Technical Education and Training, A.P. for each duplicate memo from time to time.

17. MAXIMUM PERIOD FOR COMPLETION OF DIPLOMA Programmes:

Maximum period for completion of the diploma courses is twice the duration of the course from the date of First admission (includes the period of detention and discontinuation of studies by student etc) failing which they will have to forfeit the claim for qualifying for the award of Diploma (They will not be permitted to appear for examinations after that date). This rule applies for all Diploma courses of 3 years and 3 ½ years of engineering and non-engineering courses.

18. ELIGIBILITY FOR AWARD OF DIPLOMA

A candidate is eligible for award of Diploma Certificate if he / she fulfil the following academic regulations.

- i. He / She pursued a course of study for not less than 3 / 3 ½ academic years & not more than 6 / 7 academic years.
- ii. He / she have completed all the Courses.
Students who fail to fulfil all the academic requirements for the award of the Diploma within 6 / 7 academic years from the year of admission shall forfeit their seat in the course & their seat shall stand cancelled.

For IVC & ITI Lateral Entry students:

- i. He / She pursued a course of study for not less than 2 / 2 ½ academic years & not more than 4 / 5 academic years.
- ii. He / she has completed all the Courses.
Students who fail to fulfill all the academic requirements for the award of the Diploma within 4 / 5 academic years from the year of admission shall forfeit their seat in the course & their seat shall stand cancelled.

19. ISSUE OF PHOTO COPY OF VALUED ANSWER SCRIPT, RECOUNTING& REVERIFICATION:

A) FOR ISSUE OF PHOTO COPIES OF VALUED ANSWER SCRIPTS

- I. A candidate desirous of applying for Photo copy of valued answer script/s should apply within prescribed date from the date of the declaration of the result.
- II. Photo copies of valued answer scripts will be issued to all theory Courses and Drawing Course(s).
- III. The Photo copy of valued answer script will be dispatched to the concerned candidate's address as mentioned in the application form by post.
- IV. No application can be entertained from third parties.

B) FOR RE-COUNTING(RC) and RE-VERIFICATION(RV) OF THE VALUED ANSWER SCRIPT

- i. A candidate desirous of applying for Re-verification of valued answer script should apply within prescribed date from the date of the declaration of the result.
- ii. Re-verification of valued answer script shall be done for all theory Courses' and Drawing Course(s).

- iii. The Re-verification committee constituted by the Secretary, SBTETAP with Course experts shall re-verify the answer scripts.

I. **RE-COUNTING**

The Officer of SBTET will verify the marks posted and recount them in the already valued answer script. The variations if any will be recorded separately, without making any changes on the already valued answer script. The marks awarded in the original answer script are maintained (hidden).

II. **RE-VERIFICATION**

- (i) The Committee has to verify the intactness and genuineness of the answer script(s) placed for Re-verification.
- (ii) Initially single member shall carry out the re-verification.
- (iii) On re-verification by single member, if the variation is less than 12% of maximum marks, and if there is no change in the STATUS in the result of the candidate, such cases will not be referred to the next level i.e., for 2-Tier evaluation.
- (iv) On re-verification by a single member, if the variation is more than 12% of maximum marks, it will be referred to 2-Tier evaluation.
- (v) If the 2-Tier evaluation confirms variation in marks as more than 12% of maximum marks, the variation is considered as follows:
- a) If the candidate has already passed and obtains more than 12% of the maximum marks on Re-verification, then the variation is considered.
- b) If the candidate is failed and obtains more than 12% of the maximum marks on Re-verification and secured pass marks on re-verification, then the status of the candidate changes to PASS.
- c) If a candidate is failed and obtains more than 12% of the maximum marks on Re-verification and if the marks secured on re-verification are still less than the minimum pass marks, the status of the candidate remain FAIL only.
- (vii) After Re-verification of valued answer script the same or change if any therein on Re-verification, will be communicated to the candidate.
- (viii) On Re-verification of Valued Answer Script if the candidate's marks are revised, the fee paid by the candidate will be refunded or else the candidate has to forfeit the fee amount.

Note: No request for Photo copies/ Recounting /Re-verification of valued answer script would be entertained from a candidate who is reported to have resorted to Malpractice in that examination.

20. MAL PRACTICE CASES:

If any candidate resorts to Mal Practice during examinations, he / she shall be booked and the Punishment shall be awarded as per SBTETAP rules and regulations in vogue.

21. DISCREPANCIES/ PLEAS:

Any Discrepancy /Pleas regarding results etc., shall be represented to the SBTETAP within one month from the date of issue of results. Thereafter, no such cases shall be entertained in any manner.

22. ISSUE OF DUPLICATE DIPLOMA

If a candidate loses his/her original Diploma Certificate and desires a duplicate to be issued he/she should produce written evidence to this effect. He / she may obtain a duplicate from the Secretary, State Board of Technical Education and Training, A.P., on payment of prescribed fee and on production of an affidavit signed before a First-Class Magistrate (Judicial) and non-traceable certificate from the Department of Police. In case of damage of original Diploma Certificate, he / she may obtain a duplicate certificate by surrendering the original damaged certificate on payment of prescribed fee to the State Board of Technical Education and Training, A.P.

In case the candidate cannot collect the original Diploma within 1 year from the date of issue of the certificate, the candidate has to pay the penalty prescribed by the SBTET AP from time to time.

23. ISSUE OF MIGRATION CERTIFICATE AND TRANSCRIPTS:

The Board on payment of prescribed fee will issue these certificates for the candidates who intend to prosecute Higher Studies in India or Abroad.

24. GENERAL

- i. The Board may change or amend the academic rules and regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students, for whom it is intended, with effect from the dates notified by the competent authority.
- ii. All legal matters pertaining to the State Board of Technical Education and Training, AP are within the jurisdiction of Vijayawada.
- iii. In case of any ambiguity in the interpretation of the above rules, the decision of the Secretary, SBTET, A.P is final.

VISION

Developing Animation and Graphics Engineers to be technologically adept, innovative, self-motivated and responsible citizen with human values, high quality skills and to contribute significantly towards ever changing Computer Multimedia Technologies.

MISSION

M1	To provide opportunity to Diploma students who are capable of playing pivotal role in wide aspects of modern Animation and Graphics Engineering disciplines.
M2	To make the students understand basic concepts underlie in 3D ANIMATION AND GRAPHICS ENGINEERING and able to apply them creatively in different fields of Engineering
M3	To train the student sensitive to the Environment, safety and economic context.
M4	To produce technically skilled students through intensive training in Animation and Graphical tools and applications and to prepare the students for professional career and further research.

PROGRAMME EDUCATIONAL OBJECTIVES(PEOs)

3D Animation and Graphics programme is ever changing to transform students into competent professionals with qualities, ethics and human values. On completion of the integrated programme, the students should have acquired the following characteristics

PEO1	To produce best Diploma in 3D Animation and Graphics Engineering technicians by correlatinggrowing needof the industries in modern topics with the academic input and giving the technical knowledge for further learning and to provide better career in this filed .
PEO2	To prepare the students as productive 3D Animation and Graphics Engineers, possessing supportive and leadership skills in multidisciplinary domains, expertise in Practical orientation, Communication Skills and latest technological developments.
PEO3	To give the depth of related skills and expertise in a single field, and the ability to collaborate with other disciplines and work at the Supervisory cadre.
PEO4	To promote the students in professionalism, by successful completion of the Diploma in 3D Animation and Graphics Engineering by emphasizing Field Practices in industry-oriented activities.
PEO5	To sensitize the students on social and economic commitment and to inculcate

	a nature to guard the values of community and protect environment.
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PROGRAMME SPECIFIC OUTCOME (PSOs)

PSO1	Foundation of Computer System: Ability to understand the principles and working of computer systems and can assess the hardware and software aspects of computer systems.
PSO2	Foundations of Animation and Graphical product development: Ability to understand the structure and development methodologies of Animation and graphical products. Possess professional skills and knowledge of animation and graphical product design process. Familiarity and practical competence with a broad range of Animation and Graphics Software tools and open-source platforms.
PSO3	Foundation of mathematical logical and design concepts: Ability to apply mathematical and logical concepts to develop and model real world animation and graphical product design using appropriate tools , techniques and methodologies as well as apply them at customer site in establishing new industries like Print and electronic media, cartoon production, advertising, video gaming, film and television, e-learning , studios and theatres in small scale with the help of experience gained as part of industrial training.

PROGRAM OUTCOMES (POs)

Students completing Diploma in 3D animation and Graphics Engineering are anticipated to have the following abilities	
PO1	Basic and Discipline specific knowledge: Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.
PO2	Problem analysis: Identify and analyse well-defined engineering problems using codified standard methods.
PO3	Design/ development of solutions: Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.
PO4	Engineering Tools, Experimentation and Testing: Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.
PO5	Engineering practices for society, sustainability and environment: Apply appropriate technology in context of society, sustainability, environment and ethical practices.
PO6	Project Management: Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.
PO7	Life-long learning: Ability to analyse individual needs and engage in updating in the

	context of technological changes.
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MAPPING OF PEOs WITH MISSIONS

PEO	M1	M2	M3	M4
To produce best Diploma in 3D Animation and Graphics Engineering technicians by correlating growing need of the industries in modern topics with the academic input and giving the technical knowledge for further learning and to provide better career in this field.	✓	✓	✓	✓
To prepare the students as productive 3D Animation and Graphics Engineers , possessing supportive and leadership skills in multidisciplinary domains, expertise in Practical orientation, Communication Skills and latest technological developments.	✓	✓	✓	✓
To give the depth of related skills and expertise in a single field, and the ability to collaborate with other disciplines and work at the Supervisory cadre.	✓	✓	✓	✓
To promote the students in professionalism, by successful completion of the Diploma in 3D Animation and Graphics Engineering by emphasizing Field Practices in industry-oriented activities.	✓	✓	✓	✓
To sensitize the students on social and economic commitment and to inculcate a nature to guard the values of community and protect environment.	✓	✓	✓	✓

NOTE:

In some of the courses PO5, PO6 and PO7 strength is between 1 and 2, to strengthen them, the following remedial measures for all the courses are suggested.

Short fall in PO	Remedial measures
PO5	By conducting 1) Guest lectures on motivational aspects and ethics 2) Concerned teacher will educate the students to follow ethics and morals in developing solutions 3) providing access to Online courses like Swayam program 4) seminars by senior students to the junior students to assimilate the methods followed by them to the juniors 5) Head of section will frequently visit and observe the activities being followed by the students to correct their behaviour and to inculcate morals and ethics
PO6	They can achieve this from industrial training module scheduled in 6 th semester of this curriculum by observing, analyzing and applying the mathematical and scientific fundamentals in solving the real time problems that will arise in day-to-day activities in industry.
PO7	<ol style="list-style-type: none"> 1. Providing access to Online courses like Swayam program 2. By utilizing Learning Management System(LMS) established by SBTET 3. By subscribing e-magazines/ print magazines to the institute library and made them accessible to the students. 4. By arranging Guest lecturers from the technical experts.

**DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
SCHEME OF INSTRUCTIONS AND EXAMINATION**

CURRICULUM-2020

(FIRST YEAR)

Sub Code	Name of the Subject	Instruction Periods/Week		Total Periods Per Year	Scheme Of Examinations			
		Theory	Practicals		Duration (hrs)	Sessional Marks	End Exam Marks	Total Marks
THEORY SUBJECTS								
AG-101	English-I	3	-	90	3	20	80	100
AG-102	Engineering Mathematics - I	5	-	150	3	20	80	100
AG-103	Engineering Physics	4	-	120	3	20	80	100
AG-104	Engineering Chemistry and Environmental studies	4	-	120	3	20	80	100
AG-105	Basics Of Computers with Animation and Graphics	3	-	90	3	20	80	100
AG-106	C and Graphics Programming	5	-	150	3	20	80	100
PRACTICAL SUBJECTS								
AG-107	Fundamentals of Art and Drawing		6	180	3	40	60	100
AG-108	C and Graphics Programming Lab		6	180	3	40	60	100

AG-109	Physics Lab		3	90				50
	Chemistry Lab							50
AG-110	Computer Fundamentals Lab		3	90	3	40	60	100
	Total	24	18		-			1000

AG-101,102,103,104,109,110 common with all branches

AG-106,108,107 common with DAME branch

**DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
SCHEME OF INSTRUCTIONS AND EXAMINATION
CURRICULUM-2020 (III Semester)**

Sub Code	Name of the Subject	Instruction Periods/Week		Total Periods Per Semester	Scheme Of Examinations			
		Theory	Practicals		Duration (hrs)	Sessional Marks	End Exam Marks	Total Marks
THEORY SUBJECTS								
AG-301	Mathematics –II	4		60	3	20	80	100
AG-302	Graphics Designing	5	-	75	3	20	80	100
AG-303	Elements of Film Technology	5	-	60	3	20	80	100
AG-304	2D Digital Animation	5	-	75	3	20	80	100
AG-305	3D animation and Graphics	5	-	75	3	20	80	100
PRACTICAL SUBJECTS								

AG-306	Graphics Designing Lab	-	3	45	3	40	60	100
AG-307	2D Digital Animation Lab	-	3	45	3	40	60	100
AG-308	3D animation and Graphics Lab	-	3	45	3	40	60	100
AG-309	2D Graphics Lab		3	45	3	40	60	100
AG-310	Mini Project		6	90	3	40	60	100
	Total	24	18	630		300	700	1000

AG-301 common with all branches

AG-303,304,307,309,310 common with DAME branch

**DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
SCHEME OF INSTRUCTIONS AND EXAMINATION**

CURRICULUM-2020

(IV Semester)

Sub Code	Name of the Subject	Instruction Periods/Week		Total Periods Per Semester	Scheme Of Examinations			
		Theory	Practicals		Duration (hrs)	Sessional Marks	End Exam Marks	Total Marks
THEORY SUBJECTS								
AG-401	Mathematics III	3	-	45	3	20	80	100
AG-402	Digital Photography	5	-	75	3	20	80	100
AG-403	3D modelling and Texturing	5	-	75	3	20	80	100
AG-404	Web Designing	5	-	75	3	20	80	100
AG-405	3D lighting and Rendering	5	-	75	3	20	80	100

	Techniques							
PRACTICAL SUBJECTS								
AG-406	3D modelling and Texturing lab	-	3	45	3	40	60	100
AG-407	Digital Photography Lab	-	3	45	3	40	60	100
AG-408	Communication Skills	-	3	45	3	40	60	100
AG-409	3D lighting and Rendering Techniques lab		3	45	3	40	60	100
AG-410	Networking and Web Designing Lab *Note: Develop a Mini project with Web Designing	-	7	105	3	40	60	100
	Total	23	19	630	-	300	700	1000

AG-401&408 common with all branches

AG-403,404,405,406,409,410 common with DAME branch

AG402 is common with AM-305, AG-407 is common with AM-308

**DIPLOMA IN 3D ANIMATION AND GRAPHIC S ENGINEERING
SCHEME OF INSTRUCTIONS AND EXAMINATION**

CURRICULUM-2020

(V Semester)

Sub Code	Name of the Subject	Instruction Periods/Week		Total Periods Per Semester	Scheme Of Examinations			
		Theory	Pract-icals		Duration (hrs)	Sessio-nal Marks	End Exam Marks	Total Marks
THEORY SUBJECTS								
AG-501	Industrial Management and Entrepreneurship	5	-	75	3	20	80	100

AG-502	3D rigging AND Character animation	6	-	90	3	20	80	100
AG-503	Cinema autography	4	-	60	3	20	80	100
AG-504	Advanced 3D dynamics	4	-	60	3	20	80	100
AG-505	Visual EFX and Compositing Techniques	5	-	75	3	20	80	100
PRACTICAL SUBJECTS								
AG-506	3D rigging AND Character animation lab	-	3	45	3	40	60	100
AG-507	Compositing Lab	-	3	45	3	40	60	100
AG-508	Life Skills	-	3	45	3	40	60	100
AG-509	Editing Lab		3	45	3	40	60	100
AG-510	Project work	-	6	90	3	40	60	100
	Total	24	18	630	-	260	640	900

Note:AG-501Common with DIT,DCME,DAME Branches

AG-502, AG-503, AG-505 , AG-506, AG-507, AG-509 , AG-510 common with DAME

AG-508 common with all

FIRST YEAR

**DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
SCHEME OF INSTRUCTIONS AND EXAMINATION**

CURRICULUM-2020

(FIRST YEAR)

Sub Code	Name of the Subject	Instruction Periods/Week		Total Periods Per Year	Scheme Of Examinations			
		Theory	Practicals		Duration (hrs)	Sessional Marks	End Exam Marks	Total Marks
THEORY SUBJECTS								
AG-101	English-I	3	-	90	3	20	80	100
AG-102	Engineering Mathematics - I	5	-	150	3	20	80	100
AG-103	Engineering Physics	4	-	120	3	20	80	100
AG-104	Engineering Chemistry and Environmental studies	4	-	120	3	20	80	100
AG-105	Basics of Computers with Animation and Graphics	3	-	90	3	20	80	100
AG-106	C and Graphics Programming	5	-	150	3	20	80	100
PRACTICAL SUBJECTS								
AG-107	Fundamentals of Art and Drawing	-	6	180	3	40	60	100
AG-108	C and Graphics Programming Lab	-	6	180	3	40	60	100

AG-109	Physics Lab	-	3	90	1½	20	30	50
	Chemistry Lab	-			1½	20	30	50
AG-110	Computer Fundamentals Lab		3	90	3	40	60	100
	Total	24	18	1260	-			1000

AG-101,102,103,104,109,110 common with all branches

AG-106, 107 ,108common with DAME branch

English

Course Code	Course Title	No. of Periods/Week	Total No. of Periods	Marks for FA	Marks for SA
AG-101	English	3	90	20	80

S. No.	Unit Title	No of Periods	COs Mapped
1	English for Employability	8	CO1, CO2, CO3, CO4
2	Living in Harmony	8	CO1, CO2, CO3, CO4
3	Connect with Care	8	CO1, CO2, CO3, CO4
4	Humour for Happiness	8	CO1, CO2, CO3, CO4
5	Never Ever Give Up!	8	CO1, CO2, CO3, CO4
6	Preserve or Perish	9	CO1, CO2, CO3, CO4
7	The Rainbow of Diversity	8	CO1, CO2, CO3, CO4
8	New Challenges- Newer Ideas	8	CO1, CO2, CO3, CO4
9	The End Point First!	8	CO1, CO2, CO3, CO4
10	The Equal Halves	8	CO1, CO2, CO3, CO4
11	Dealing with Disaster	9	CO1, CO2, CO3, CO4
Total Periods		90	

Course Objectives	To improve the skills of English Language use by enriching vocabulary and learning accurate structures for effective communication.
	To comprehend themes for value based living in professional and personal settings.

CO No.	Course Outcomes
CO1	Applies perceptions of themes related to societal responsibility of adolescents towards their surroundings.
CO2	Demonstrates knowledge of form and function of 'grammar items' and use them in both academic and everyday situations.
CO3	Demonstrates effective English communication skills with competence in listening, speaking, reading and writing in academic, professional and everyday contexts.
CO4	Displays positivity and values of harmonious living in personal and professional spheres as reflected through communication.

CO-PO Matrix

Course Code AG-101	Course Title: English Number of Course Outcomes: 4			No. of Periods: 90	
POs	Mapped with CO No.	CO Periods Addressing PO in Column 1		Level of Mapping (1,2,3)	Remarks
		Number	Percentage		
PO1		Not directly Applicable for English course, however activities that use content from science and technology relevant to the Programme taken up by the student shall be exploited for communication in the Course.			
PO2					
PO3					
PO4					
PO5	CO1, CO2, CO3, CO4	20	22		>50%: Level 3
PO6	CO1, CO2, CO3, CO4	52	58		21-50%: Level 2
PO7	CO1, CO2, CO3, CO4	18	20		Up to 20%: Level 1

Level 3 – Strongly Mapped

Level 2- Moderately Mapped

Level 1- Slightly Mapped

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
CO 1					✓	✓	✓
CO 2					✓	✓	✓
CO3					✓	✓	✓
CO 4					✓	✓	✓

NOTE: CO-PO groups shall be fulfilled through activities that use content from science and technology relevant to the Programme taken up by the student shall be exploited for communication in the Course.

PO5: Appropriate quiz programme may be conducted at intervals and duration as decided by concerned teacher.

S. No.	Name of the Unit	Periods Allocated	Weightage Allocated	Marks Wise Distribution of Weightage	Question Wise Distribution of Weightage	CO's Mapped
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PO6: Seminars on applications of mathematics in various engineering disciplines are to be planned and conducted.

PO7: Such activities are to be planned that students visit library to refer standard books on Mathematics and latest updates in reputed national and international journals, attending seminars, learning mathematical software tools.

Blue Print of Question Paper:

				R	U	Ap	An	R	U	Ap	An					
1	English for Employability	8	17	3	8*			1	1*	1*		CO1, CO2, CO3, CO4				
2	Living in Harmony	8		3				1						CO1, CO2, CO3, CO4		
3	Connect with Care	8				3								CO1, CO2, CO3, CO4		
4	Humour for Happiness	8	14		3	8*			1	1*		CO1, CO2, CO3, CO4				
5	Never Ever Give Up!	8			3				1				CO1, CO2, CO3, CO4			
6	Preserve or Perish	9	14		8*	3			1*	1		CO1, CO2, CO3, CO4				
7	The Rainbow of Diversity	8				3						1		CO1, CO2, CO3, CO4		
8	New Challenges - Newer Ideas	8	35		8*	8*+ 3+3+ 3			1*	4	1*	CO1, CO2, CO3, CO4				
9	The End Point First!	8														CO1, CO2, CO3, CO4
10	The Equal Halves	8														CO1, CO2, CO3, CO4
11	Dealing with Disasters	9					10*					CO1, CO2, CO3, CO4				
TOTAL		90	80	6	30	34	10	2	5	8	1					

PART-A: 10 Questions 3 marks each =30 Marks

All Questions are compulsory

: 60 minutes

PART-B: 5 Questions 8 marks each =40 Marks

Internal choice

: 90 minutes

Part-C: 1 Question 10 marks =10 Marks

(Higher Order Question)

No choice, one compulsory question : 30 minutes

NOTE: * indicates questions can be given from any of the corresponding lessons in the blue print.

Question Paper Pattern for Unit Tests

Part A: 16 marks: 4 questions with 1 mark each (FIB, True/false, one word/phrase, etc.)

4 questions with 3 marks each (short answer/ descriptive/ applicative questions)

Part B: 24 marks: 3 questions 8 marks each with internal choice

Learning Outcomes

1. English for Employability

- 1.1. Explain the need for improving communication in English for employability
- 1.2. Use adjectives and articles effectively while speaking and in writing
- 1.3. Write simple sentences .

2. Living in Harmony

- 2.1. Develop positive self-esteem for harmonious relationships
- 2.2. Use affixation to form new words
- 2.3. Use prepositions and use a few phrasal verbs contextually

3. Connect with Care

- 3.1. Use social media with discretion
- 3.2. Speak about abilities and possibilities
- 3.3. Make requests and express obligations
- 3.4. Use modal verbs and main verbs in appropriate form
- 3.5. Write short dialogues for everyday situations

4. Humour for Happiness

- 4.1. Explain the importance of humour for a healthy living
- 4.2. Improve vocabulary related to the theme
- 4.3. Display reading and speaking skills
- 4.4. Frame sentences with proper Subject – Verb agreement
- 4.5. Explain the features of a good paragraph and learn how to gather ideas as a preliminary step for writing a good paragraph.

5. Never Ever Give Up!

- 5.1. Practice to deal with failures in life.
- 5.2. Use the present tense form for various every day communicative functions such as speaking and writing about routines, professions, scientific descriptions and sports commentary.
- 5.3. Write paragraphs with coherence and other necessary skills.

6. Preserve or Perish

- 6.1. Describe the ecological challenges that we face today and act to save the environment.
- 6.2. Narrate / Report past events.
- 6.3. Develop vocabulary related to environment.
- 6.4. Write e-mails.

7. The Rainbow of Diversity

- 7.1. Illustrate and value other cultures for a happy living in multi-cultural workspace
- 7.2. use different types of sentences
- 7.3. Ask for or give directions, information, instructions
- 7.4. Use language to express emotions in various situations
- 7.5. Write letters in various real life situations

8. New Challenges – Newer Ideas

- 8.1. Explain the functional difference between Active Voice and Passive Voice
- 8.2. Use Passive Voice to speak and write in various contexts
- 8.3. List the major parts and salient features of an essay
- 8.4. Explain latest innovations and get motivated

9. The End Point First!

- 9.1. Illustrate the importance of setting a goal in life

- 9.2. Report about what others have said both in speaking and writing
- 9.3. Write an essay following the structure in a cohesive and comprehensive manner
- 9.4. Apply the words related to Goal Setting in conversations and in life

10. The Equal Halves

- 10.1. Value the other genders and develop a gender-balanced view towards life
- 10.2. Identify the use of different conjunctions in synthesising sentences
- 10.3. Write various types of sentences to compare and contrast the ideas
- 10.4. Apply the knowledge of sentence synthesis in revising and rewriting short essays
- 10.5. Develop discourses in speech and writing

11. Dealing with Disasters

- 11.1. Speak and write about different kinds of disasters and the concept of disaster management
- 11.2. Generate vocabulary relevant to disaster management and use it in sentences
- 11.3. Analyze an error in a sentence and correct it
- 11.4. write different kinds of reports

Textbook: INTERACT (A Textbook for I Year English) - Published by SBTET, AP

Reference Books:

- Martin Hewings : Advanced Grammar in Use, Cambridge University Press
- Murphy, Raymond : English Grammar in Use, Cambridge University Press
- Sidney Greenbaum : Oxford English Grammar, Oxford University Press
- Wren and Martin (Revised
by N.D.V. Prasad Rao) : English Grammar and Composition, Blackie ELT Books, S.
Chand and Co.
- Sarah Freeman : Strengthen Your Writing, MacGillan

UNIT TEST-1

Time: 90 minutes

Max. Marks: 40

PART-A

4X4= 16 marks

Instructions: Answer all the questions. Each question carries FOUR Marks.

1. Rewrite / Fill in the blank as directed. Each question carries ½ Mark.

(CO2)

a) Write the antonym of 'cruel'

b) Write the synonym of 'love'

c) Give prefix to 'adventure'.

d) Give suffix to 'liberate'

e) It is _____ universal truth. (Fill in with suitable article)

f) The boy is fond _____ ice-cream. (Fill in the blank with proper preposition)

g) He _____ not like sweets. (Fill in the blank with correct primary auxiliary verb.)

h) We _____ respect our national flag. (Fill in with a proper modal verb)

2. Rewrite the sentences as directed. Each question carries One mark. 4X1=4 Marks

(CO2)

a) No other metal is so useful as iron. (Change into superlative degree)

b) Very few students are so clever as Ramesh. (Change into comparative degree)

c) Guess the contextual meaning of the italicized word in the following sentence.

"The CBI officer has *interrogated* the bank employees in connection with the scam."

d) only sings plays Prasanth not also well but cricket. (Rearrange the jumbled words)

3. Fill in the blanks with proper form of the verb given in brackets. 4X1 = 4 marks

(CO2)

The IPSGM _____(hold) in our college last month. Nearly all the colleges in our zone _____(participate) in the event. The prizes _____ (distribute) by the district collector.

Next year, Government Polytechnic, Vijayawada _____ (conduct) the games meet.

4. Rewrite the following sentences after making necessary corrections: 4X 1= 4 Marks

(CO3)

a) The police has arrested the culprit.

b) Three hundred miles are a long distance.

c) The Principal along with the Heads of Sections have visited the laboratories.

d) Either he or I is to blame.

PART-B

3X8=24 Marks

Instructions: Answer all the questions and each question carries EIGHT marks.

5. Write a dialogue of at least five turns between a shopkeeper and customer about buying a mobile phone.

(CO3)

6. Make an analysis and write a paragraph in around 100 words about your strengths and weaknesses in learning and using English and also the measures to improve it.

(CO3)

7. Write a paragraph in about 100 words on how to overcome low esteem and negativity.

(CO3, CO4)

UNIT TEST-II

Time: 90 minutes

Max. Marks: 40

PART-A

4X4= 16 Marks

Instructions: Answer all the questions. Each question carries FOUR marks.

1. Match the words in column A with their corresponding meanings in column B (CO2)
- | Column A | Column B |
|--------------|---------------|
| a) Deserve | i) continuous |
| b) hidden | ii) protect |
| c) Preserve | iii) worthy |
| d) Incessant | iv) praise |
| | v) unseen |
| | vi) affection |
2. Rewrite as directed: (CO3)
- You ask your Mom to give you another chocolate. (Change into a request)
 - The baby fell down and got injured. (Change into an exclamatory sentence)
 - The match was very interesting. (Frame a question using 'how')
 - Hemanth submitted his project report last week. (Frame Yes-No question)
3. Fill in the blanks with appropriate forms of verbs given in brackets: (CO2)
- The Sun _____ (set) in the west.
 - Balu _____ (sing) for over fifty years in the films.
 - We _____ (see) a camel on the road yesterday.
 - They _____ (enter) the stadium before the gates were closed.
4. Change the voice of the following: (CO2)
- Marconi invented the radio.
 - Sravanthi has been offered a job.
 - Pragathi can type the letter.
 - The Chief Guest will be received by the Final year students.

PART-B

3X8=24 Marks

Answer all the questions. Each question carries EIGHT marks.

5. Write a letter to your younger brother motivating him to deal with failures and hurdles in life. (CO3)
6. Write an essay in around 120 words on the role of robots in the modern world. (CO3)
7. Read the following passage and answer the questions that follow: (CO3)
- The greatest enemy of mankind, as people have discovered, is not science, but war. Science merely reflects the social forces by which it is surrounded. It was found that when there is peace, science is constructive when there is war, science is perverted to destructive end. The weapons which science gives us do not necessarily create war. These make war increasingly more terrible. Until now, it has brought us on the doorstep of doom. Our main problem, therefore, is not to curb science, but to substitute law for force, and international government for anarchy in the relations of one nation with another. That is a job in which everybody must participate, including the scientists. Now we are face to face with these urgent questions: Can education and tolerance, understanding and creative intelligence run fast enough to keep us side by side without our mounting capacity to destroy? That is the question which we shall have to answer, one way or the other, in this generation. Science must help us in the answer, but the main decision lies within ourselves. The hour is late and our work has scarcely begun.
- What is the chief enemy of man?
 - What does science reflect?
 - When is science perverted?

- d. What makes war more terrible?
- e. Why do we need international government?
- f. What are the four aspects that may stop destruction?
- g. Have we really started our work to fight the problem discussed?
- h. Pick the word from the passage that would mean: 'replace with other one'

PART-A

4X4 = 16 Marks

Instructions: Answer all the questions. Each question carries Four marks.

1. Give the meaning of the word in italics: (CO3)
 - a) When the girls laughed in the class, the teacher was *furiosus*.
 - b) He was *rusticated* from the school for his misbehaviour.
 - c) Vikramaditya was a *benevolent* Indian King.
 - d) We should not show any *discrimination* between boys and girls.
2. Change the speech of the following: (CO2)
 - a) He said, "I am sorry."
 - b) The teacher said to the boys, "Why are you late?"
 - c) Sushma said that she had submitted her report recently.
 - d) Pratap requested Priya to give him her pen.
3. Rewrite as directed: (CO2)
 - a) Though he was weak, he took the test. (change into a simple sentence)
 - b) You must work hard to achieve success. (change into a complex sentence)
 - c) If you run fast, you will catch the bus. (change into a compound sentence)
 - d) The fog disappeared when the Sun rose. (Split into two simple sentences)
4. Locate eight errors from the following passage and correct them. (CO2)

Once upon a time there live a king who was very kind to his people. In his council of ministers, there is a wise man. He had a son called Sumanth who was a educated and highly learned. Once the wise minister fall sick. All the physicists in the country could not heal him. Then Sumanth will go in search of medicine in Himalayas. He bring the special medicinal roots to cure his father's sickness. Sumanth looked before his father carefully and healed him. The king rewarded Sumanth with rich gifts.

PART- B

3X8 = 24 Marks

Instructions: Answer all the questions and each one carries eight marks.

5. Read the following paragraph and make notes first and then its summary. (CO3)

Astronauts are people who travel on space ships. They need to have a very clean home. They travel far from Earth. We need clean kitchens everywhere on earth and in space. Astronauts have to solve two problems: how to get food and how to keep their spaceship clean. Here is how they solved the food problem. At first, the astronauts took tubes of food with them into space. They would squeeze a tube and eat semi-liquid food. It did not taste great, but since they did not need to take dishes or silverware with them, they had no dishes to wash. Today's spaceships have a bigger menu. Astronauts can eat from bowls. In fact, they take cereal and other standard foods with them. The foods are packaged in special containers to keep them fresh. They use knives, forks, and spoons. One unusual item on their table is a pair of scissors. They use the scissors to open the food packages. They can eat right from the package. They have a kitchen on the spaceship. Its oven can heat food to 170 degrees. The kitchen has water and sets of meals that come on trays. The astronauts choose their menu before they go into space. They take a lot of food with them. The astronauts keep bread and fresh fruits and vegetables in a special food locker. How do they keep the kitchen clean? They do not have to worry about mice or other rodents. They make sure that there are no rodents before the ship leaves. But sometimes mice travel on the ship. Those mice are part of experiments. They live in cages. How do astronauts keep their trays clean? That is another health problem the astronauts solve. They need to stay healthy in space. To carry a lot of water

to wash trays would be a lot of extra weight. They pack wet wipes in plastic bags. They use them to clean trays. So, their kitchen is clean and they stay healthy.

6. Write an essay in about 120 words on the importance of goal setting and your short and long term goals.
(CO3,CO4)
7. Write a report about the bush fire that raged in Australia recently by using the following clues: forest, natural disaster, wild fire, dried leaves, no rain fall, wild animals, burnt alive, loss of flora and fauna, fire fighters, uncontrollable, moderate rains, environmental pollution, measures to protect...etc.
(CO3)

Model Question Paper
C20-AG-101- ENGLISH

Time:3hrs

Max.Marks:80

PART-A

10X3=30

MarksInstructions: Answer all the questions. Each question carries Three marks.

1. a) Fill in the blanks with suitable articles: **(CO2)**

I have seen _____ European at _____ local market.

b) Fill in with proper form of adjective given in the bracket: **(CO2)**

China is the _____ country in the world. (populous, more populous, most populous)

c) i) Choose the synonym from the following for the word : 'filthy' **(CO3)**

dirty / clean / hygienic / tidy

ii) Choose the antonym from the following for the word: 'exterior' **(CO3)**

external / internal / open / interior

2. a) i) Give prefix for the word: 'popular' **(CO2)**

ii) Write suffix for the word : 'king' **(CO2)**

b) He was married _____ her _____ January 2015. (Fill in with appropriate preposition)

(CO3)

c) Match the words in column A with their corresponding meanings in column B:

(CO2)

Column-A

Column-B

- | | |
|------------|-----------|
| i) Dynamic | a) tasty |
| ii) Gloomy | b) active |
| c) sad | |
| d) proud | |

3. a) The old man *hunted* for his spectacles. (Give the contextual meaning of the word in italics) **(CO3)**

b) The committee / have submitted / its report / to the President. (identify the part which contains an error) **(CO3)**

c) recently has a scooter purchased Shanthi. (Rearrange the jumbled words to make a meaningful sentence.) **(CO3)**

4. a) Use the following primary auxiliary verb in sentence of your own: **(CO2)**

'does'

b) Fill in the blank with proper modal auxiliary verb based on the clue in the bracket:

Harish _____ speak four languages. (ability)**(CO2)**

c) Rakesh wants two hundred rupees from his father. (Write the sentence how he requests his Father) **(CO2)**

5. Fill in the blanks with suitable form of the verb given in brackets: **(CO2)**

a) He _____ (go) for a walk daily.

b) The bus _____ (arrive) just now.

c) We _____ (live) in Chennai since 2005.

6. Change the voice of the following sentences: (CO2)
a) English is spoken all over the world.
b) They watched a movie yesterday.
c) The Chief Minister will inaugurate the exhibition.

7. a) It is a beautiful rainbow. (Change into an exclamatory sentence) (CO3)
b) C.V. Raman won the Nobel Prize in 1930. (Frame a question using 'When') (CO3)
c) He can swim across the river. (change into 'Yes / No' question) (CO3)

8. Change the speech of the following: (CO2)
a) He said, "I will go to Delhi tomorrow."
b) Ravi said to Ashok, " Where are you going?"
c) She told him to mind his own business.

9. Rewrite as directed: (CO2)
a) In spite of being busy he attended the meeting. (Rewrite the sentence using 'though')
b) She is poor. She is honest. (combine the two sentences using 'but')
c) On seeing the tiger, he climbed a tree. (split into two simple sentences)

10. Rewrite the following sentences after making necessary corrections: (CO2)
a) We have gone to picnic yesterday.
b) Suresh watched T.V when I went to his house.
c) They left Gujarat before the earthquake occurred.

PART-B

5X8=40

Instructions: Answer the following questions. Each question carries EIGHT marks.

11. Write a paragraph in about 100 words on what you do daily. (CO3,CO4)
OR

Write a paragraph in about 100 words on the uses and misuses of social media.

12. Construct a dialogue of at least five turns between an American and you about places worth visiting in your city. (CO3,CO4)

OR

Compose a dialogue of at least five turns between two friends, one favouring homemade food and the other, fast foods.

13. Write a letter to your parents about your preparation for year-end examinations. (CO3,CO4)
OR

Write a letter to the editor of a newspaper about the inconvenience caused due to loud speakers in your area.

14. Write an essay in about 120 words on measures to prevent water pollution.
OR

Write an essay in about 120 words on importance of gender equality.

15. Read the following passage and answer the questions that follow: (CO3)

A farmer in ancient China had a neighbour who was a hunter, and who owned ferocious and poorly trained hunting dogs. They jumped over the fence frequently and chased the farmer's lambs. The farmer asked his neighbour to keep his dogs in check, but this fell on deaf ears. One day the dogs again jumped the fence, attacked and severely injured several of the lambs.

The farmer had had enough, and went to town to consult a judge who listened carefully to the story and said: "I could punish the hunter and instruct him to keep his dogs chained or lock them up. But you would lose a friend and gain an enemy. Which would you rather have, friend or foe for a neighbour?" The farmer replied that he preferred a friend. "Alright, I will offer you a solution that keeps your lambs safe, and which will keep your a neighbour a friend." Having heard the judge's solution, the farmer agreed.

Once at home, the farmer immediately put the judge's suggestions to the test. He took three of his best lambs and presented them to his neighbour's three small sons, who were beside themselves with joy and began to play with them. To protect his son's newly acquired playthings, the hunter built a strong kennel for his dogs. Since then, the dogs never again bothered the farmer's lambs. Out of gratitude for the farmer's generosity toward his sons, the hunter often shared the game he had hunted with the farmer. The farmer reciprocated by sending the hunter the cheese he had made. Within a short time the neighbours became good friends.

- a) What kind of dogs does the neighbor have?
- b) When did the farmer consult the judge?
- c) What would be the consequence if the judge punished the neighbor?
- d) What was the solution suggested by the judge?
- e) What did the neighbour's sons do with the gifts they received?
- f) How did the dogs stop bothering the farmer's lambs?
- g) What items are exchanged happily between the two neighbours?
- h) Pick the word from the passage that would mean: 'a closed shelter for dogs'.

OR

Read the following short poem and answer the questions that follow:

Crisp in the winter's morning,
Softly all through the night,
What is this without warning,
Falling and white?

I have never seen snow,
But I can imagine it quite –
Not how it tastes, but I know,
It falls and is white.

One morning I'll open the door,
To bring in the morning's milk,
And all around there'll be snow –
Fallen and still.

How I'll roll in the stuff!
How I'll tumble and spin!
Until the neighbours cry,
Enough! And send me back in.

- Q.1. What is the poem about?
2. How does snow fall?
3. Did you ever touch snow? How did you feel?
4. a) Pick the word from the poem that means 'slip and fall'
- b) Write the antonym for the word 'soft'

SECTION – C

1X10=10 Marks

16. Write a report on the blood donation camp organized by International Red Cross Society in your college. Use the following clues: date, time, place, arrangements, donors, equipment, doctors, response, sponsors, snacks, volunteers, help others, save lives...etc.

Course Code	Course Title	No. of Periods/week	Total No. of periods	Marks for FA	Marks for SA
AG-102	Engineering Mathematics-I	5	150	20	80

S.No.	Unit Title	No. of periods	COs mapped
1	Algebra	31	CO1
2	Trigonometry	44	CO2
3	Co-ordinate Geometry	23	CO3
4	Differential Calculus	33	CO4
5	Applications of Differentiation	19	CO4, CO5
Total Periods		150	

Course Objectives	<p>(i) To apply the principles of Algebra, Trigonometry and Co-Ordinate Geometry to real-time problems in engineering.</p> <p>(ii) To comprehend and apply the concept of Differential Calculus in engineering applications.</p>
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Course Outcomes	CO1	Identify various functions, resolve partial fractions and solve problems on matrices.
	CO2	Solve problems using the concept of trigonometric functions, their inverses and complex numbers.
	CO3	Find the equations and properties of straight lines, circles and conic sections in coordinate system.
	CO4	Evaluate the limits and derivatives of various functions.
	CO5	Evaluate solutions for engineering problems using differentiation.

**ENGINEERING MATHEMATICS – I
COMMON TO ALL BRANCHES**

Learning Outcomes

UNIT - I

C.O. 1 Identify various functions, resolve partial fractions and solve problems on matrices.

L.O.1.1 Define Set, ordered pairs and Cartesian product - examples.

1.2 Explain Relations and functions – examples

1.3 Find Domain & Range of functions – simple examples.

1.4 Classify types of functions (into, many-to-one, one-one, onto and bijective).

1.5 Define inverse functions - examples.

1.6 Define rational, proper and improper fractions of polynomials.

1.7 Explain the procedure of resolving rational fractions of the type mentioned below into partial fractions

$$\begin{array}{ll} \text{i)} & \frac{f(x)}{(ax+b)(cx+d)} \quad \text{ii)} & \frac{f(x)}{(ax+b)^2(cx+d)} \\ \text{iii)} & \frac{f(x)}{(x^2+a^2)(bx+c)} \quad \text{iv)} & \frac{f(x)}{(x^2+a^2)(x^2+b^2)} \end{array}$$

1.8 Define a matrix and order of a matrix.

1.9 State various types of matrices with examples (emphasis on 3rd order square matrices).

1.10 Compute sum, scalar multiplication and product of matrices. Illustrate the properties of these operations such as associative, distributive, commutative properties with examples and counter examples.

1.11 Define the transpose of a matrix and write its properties;

1.12 Define symmetric and skew-symmetric matrices with examples. Resolve a square matrix into a sum of a symmetric and skew-symmetric matrices and provide examples.

1.13 Define determinant of a square matrix, minor, co-factor of an element of a 3x3 square matrix with examples. Expand the determinant of a 3 x 3 matrix using Laplace expansion formula. State and apply the properties of determinants to solve problems.

1.14 Distinguish singular and non-singular matrices. Define multiplicative inverse of a matrix and list properties of adjoint and inverse. Compute adjoint and multiplicative inverse of a square matrix.

1.15 Solve system of 3 linear equations in 3 unknowns using Cramer's rule and matrix inversion method.

UNIT - II

C.O.2 Solve problems using the concept of trigonometric functions, their inverses and complex numbers.

L.O. 2.1 Define trigonometric ratios of any angle.

2.2 List the values of trigonometric ratios at specified values.

2.3 Draw graphs of trigonometric functions.

2.4 Explain periodicity of trigonometric functions.

2.5 Define compound angles and state the formulae of $\sin(A\pm B)$, $\cos(A\pm B)$, $\tan(A\pm B)$ and $\cot(A\pm B)$.

2.6 Give simple examples on compound angles to derive the values of $\sin 15^\circ$, $\cos 15^\circ$, $\sin 75^\circ$, $\cos 75^\circ$, $\tan 15^\circ$, $\tan 75^\circ$ etc.

- 2.7 Derive identities like $\sin(A+B) \sin(A-B) = \sin^2 A - \sin^2 B$ etc.
- 2.8 Solve simple problems on compound angles.
- 2.9 Derive the formulae of multiple angles $2A, 3A$ etc and sub multiple angles $A/2$ in terms of angle A of trigonometric functions.
- 2.10 Derive useful allied formulas like $\sin^2 A = (1 - \cos 2A)/2$ etc.
- 2.11 Solve simple problems using the above formulae

Syllabus for Unit test-I completed

- 2.12 Derive the formulae on transforming sum or difference of two trigonometric ratios into a product and vice versa, examples on these formulae.
- 2.13 Solve problems by applying these formulae to sum or difference or product of three or more terms.
- 2.14 Explain the concept of the inverse of a trigonometric function by selecting an appropriate domain and range.
- 2.15 Define inverses of six trigonometric functions along with their domains and ranges.
- 2.16 Derive relations between inverse trigonometric functions so that given $A = \sin^{-1}x$, express angle A in terms of other inverse trigonometric functions with examples.
- 2.17 State various properties of inverse trigonometric functions and identities like $\sin^{-1}x + \cos^{-1}x = \frac{\pi}{2}$ etc.
- 2.18 Apply formulae like $\tan^{-1}x + \tan^{-1}y = \tan^{-1}\left(\frac{x+y}{1-xy}\right)$, where $x \geq 0, y \geq 0, xy < 1$ etc., to solve Simple problems.
- 2.19 Explain what is meant by solutions of trigonometric equations and find the general solutions of $\sin x = k, \cos x = k$ and $\tan x = k$ with appropriate examples.
- 2.20 Solve models of the type $a \sin^2 x + b \sin x + c = 0, a \cos x + b \sin x = c$ etc., and problems using simple transformations.
- 2.21 State sine rule, cosine rule, tangent rule and projection rule.
- 2.22 Explain the formulae for $\sin A/2, \cos A/2, \tan A/2$ and $\cot A/2$ in terms of semi-perimeter s and sides a, b, c and solve problems.
- 2.23 List various formulae for the area of a triangle.
- 2.24 Solve problems using the above formulae.
- 2.25 Define $\sinh x, \cosh x$ and $\tanh x$ and list the hyperbolic identities.
- 2.26 Represent inverse hyperbolic functions in terms of logarithms.
- 2.27 Define complex number, its modulus, conjugate and list their properties.
- 2.28 Define the operations on complex numbers with examples.
- 2.29 Define amplitude of a complex number.
- 2.30 Represent the complex number in various forms like modulus-amplitude (polar) form, Exponential (Euler) form with examples.
- 2.31 Write DeMoivre's theorem (without proof) and illustrate with simple examples.

UNIT - III
Coordinate Geometry

C.O. 3 Find the equations and properties of straight lines, circles and conic sections in coordinate system.

L.O. 3.1 Write the different forms of a straight line – general form, point-slope form, slope-intercept form, two-point form, intercept form and normal form or perpendicular form.

3.2 Solve simple problems on the above forms.

3.3 Find distance of a point from a line, acute angle between two lines, intersection of two non-parallel lines and distance between two parallel lines.

3.4 Define locus of a point and define a circle.

3.5 Write the general equation of a circle and find the centre and radius.

3.6 Find the equation of a circle given (i) centre and radius, (ii) two ends of a diameter (iii) Centre and a point on the circumference (iv) three non collinear points.

3.7. Define a conic section.

3.8 Explain the terms focus, directrix, eccentricity, axes and latus rectum of a conic with illustrations.

3.9 Find the equation of a conic when focus, directrix and eccentricity are given.

3.10 Describe the properties of Parabola, Ellipse and Hyperbola in standard forms whose axes are along co-ordinate axes and solve simple examples on above.

Syllabus for Unit test-II completed

C.O.4 Evaluate the limits and derivatives of various functions.

L.O. 4.1 Explain the concept of limit and meaning of $\lim_{x \rightarrow a} f(x) = l$ and state the properties of limits.

4.2 Evaluate the limits of the type $\lim_{x \rightarrow l} \frac{f(x)}{g(x)}$ and $\lim_{x \rightarrow \infty} \frac{f(x)}{g(x)}$

4.3 Mention the Standard limits $\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a}$, $\lim_{x \rightarrow 0} \frac{\sin x}{x}$, $\lim_{x \rightarrow 0} \frac{\tan x}{x}$, $\lim_{x \rightarrow 0} \frac{a^x - 1}{x}$,

$\lim_{x \rightarrow 0} \frac{e^x - 1}{x}$, $\lim_{x \rightarrow 0} (1+x)^{\frac{1}{x}}$, $\lim_{x \rightarrow \infty} \left(1 + \frac{1}{x}\right)^x$ (without proof) and solve the problems

using these standard limits.

4.4 Explain the concept of continuity of a function at a point and on an interval with some examples whether a given function is continuous or not.

4.5 State the concept of derivative of a function $y = f(x)$ – definition, first principle as

$\lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ and also provide standard notations to denote the derivative of a function.

4.6 State the significance of derivative in scientific and engineering applications.

- 4.7 Find the derivatives of elementary functions like x^n , a^x , e^x , $\log x$, $\sin x$, $\cos x$, $\tan x$, $\sec x$, $\operatorname{cosec} x$ and $\cot x$ using the first principles.
- 4.8 Find the derivatives of simple functions from the first principle .
- 4.9 State the rules of differentiation of sum, difference, scalar multiplication, product and quotient of functions with illustrative and simple examples.
- 4.10 Explain the method of differentiation of a function of a function (Chain rule) with illustrative examples.
- 4.11 Find the derivatives of Inverse Trigonometric functions and examples using the Trigonometric transformations.
- 4.12 Explain the method of differentiation of a function with respect to another function and also differentiation of parametric functions with examples.
- 4.13 Find the derivatives of hyperbolic functions.
- 4.14 Explain the procedures for finding the derivatives of implicit function with examples.
- 4.15 Explain the need of taking logarithms for differentiating some functions with examples like $[f(x)]^{g(x)}$.
- 4.16 Explain the concept of finding the higher order derivatives of second and third order with examples.
- 4.17 Explain the concept of functions of several variables, partial derivatives and difference between the ordinary and partial derivatives with simple examples.
- 4.18 Explain the definition of Homogenous function of degree n .
- 4.19 Explain Euler's theorem for homogeneous functions with applications to simple problems.

C.O. 5 Evaluate solutions for engineering problems using differentiation.

- L.O.** 5.1 State the geometrical meaning of the derivative as the slope of the tangent to the curve $y=f(x)$ at any point on the curve.
- 5.2 Explain the concept of derivative to find the slope of tangent and to find the equation of tangent and normal to the curve $y=f(x)$ at any point on it.
- 5.3 Find the lengths of tangent, normal, sub-tangent and sub normal at any point on the curve $y=f(x)$.
- 5.4 Explain the derivative as a rate of change in distance-time relations to find the velocity and acceleration of a moving particle with examples.
- 5.5 Explain the derivative as a rate measurer in the problems where the quantities like volumes, areas vary with respect to time- illustrative examples.
- 5.6 Define the concept of increasing and decreasing functions.
- 5.7 Explain the conditions to find points where the given function is increasing or decreasing with illustrative examples.
- 5.8 Explain the procedure to find the extreme values (maxima or minima) of a function of single variable- simple problems yielding maxima and minima.
- 5.9 Solve problems on maxima and minima in applications like finding areas, volumes etc.

5.10 Apply the concept of derivatives to find the errors and approximations in simple problems.

Syllabus for Unit test-III completed

CO/PO – Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	1	2				3	2	3
CO2	3	3	3	2				3	3	1
CO3	3	2	2	1				3	2	2
CO4	3	3	2	2				3	2	1
CO5	3	3	3	3				3	3	3
Avg	3	2.6	2.5	2				3	2.4	2

3 = Strongly mapped (High), **2** =moderately mapped (Medium), **1** =slightly mapped (Low)

Note:

PO5: Appropriate quiz programme may be conducted at intervals and duration as decided by concerned teacher.

PO6: Seminars on applications of mathematics in various engineering disciplines are to be planned and conducted.

PO7: Such activities are to be planned that students visit library to refer standard books on Mathematics and latest updates in reputed national and international journals, attending seminars, learning mathematical software tools.

PSO1: An ability to understand the concepts of basic mathematical concepts and to apply them in various areas like computer programming, civil constructions, fluid dynamics, electrical and electronic systems and all concerned engineering disciplines.

PSO2: An ability to solve the Engineering problems using latest software tool, along with analytical skills to arrive at faster and appropriate solutions.

PSO3: Wisdom of social and environmental awareness along with ethical responsibility to have a successful career as an engineer and to sustain passion and zeal for real world technological applications.

PO- CO – Mapping strength

PO no	Mapped with CO no	CO periods addressing PO in column I		Level (1,2 or 3)	Remarks
		No	%		
1	CO1, CO2, CO3,CO4,CO5	150	100%	3	>40% Level 3 Highly addressed
2	CO1, CO2, CO3,CO4,CO5	138	92%	3	
3	CO1, CO2, CO3,CO4,CO5	133	88.6%	3	
4	CO1, CO2, CO3,CO4,CO5	120	80%	3	
PSO 1	CO1, CO2, CO3,CO4,CO5	150	100%	3	25% to 40% Level 2 Moderately addressed
PSO 2	CO1, CO2, CO3,CO4,CO5	135	90%	3	5% to 25% Level 1 Low addressed
PSO 3	CO1, CO2, CO3,CO4,CO5	125	83.3%	3	<5% Not addressed

COMMON TO ALL BRANCHES
COURSE CONTENT

Unit-I

Algebra

1. Relations and Functions:

Define Set, Ordered pairs, Cartesian product, Relations, functions, domain & range of functions. Describe types of functions (in-to, many-to-one, one-one, onto and bijective) and inverse functions – examples.

2. Partial Fractions:

Define rational, proper and improper fractions of polynomials. Resolve rational fractions in to their partial fractions covering the types mentioned below.

$$i) \frac{f(x)}{(ax+b)(cx+d)} \quad ii) \frac{f(x)}{(ax+b)^2(cx+d)}$$

$$iii) \frac{f(x)}{(x^2+a^2)(bx+c)} \quad iv) \frac{f(x)}{(x^2+a^2)(x^2+b^2)}$$

3. Matrices:

Definition of a matrix, types of matrices-examples, algebra of matrices-equality of two matrices, sum, scalar multiplication and product of matrices. Transpose of a matrix-Symmetric, skew symmetric matrices-Minor, cofactor of an element-Determinant of a square matrix-Laplace's expansion, properties of determinants. Singular and non-singular matrices-Adjoint and multiplicative inverse of a square matrix- examples-System of linear equations in 3 variables-Solutions by Cramers's rule and Matrix inversion method-examples.

Unit-II

Trigonometry

4. Trigonometric ratios:

Definition of trigonometric ratios of any angle, values of trigonometric ratios at specified values, draw graphs of trigonometric functions, periodicity of trigonometric functions.

5. Compound angles:

Formulas of $\sin(A \pm B)$, $\cos(A \pm B)$, $\tan(A \pm B)$, $\cot(A \pm B)$, and related identities with problems.

6. Multiple and sub multiple angles:

Formulae for trigonometric ratios of multiple angles $2A$, $3A$ and sub multiple angles $A/2$ with problems.

7. Transformations of products into sums or differences and vice versa simple problems

8. Inverse trigonometric functions:

Definition, domains and ranges-basic properties- problems.

9. Trigonometric equations:

Concept of a solution, principal value and general solution of trigonometric equations: $\sin x = k$, $\cos x = k$, $\tan x = k$, where k is a constant. Solutions of simple quadratic equations, equations involving usage of transformations- problems.

10. Properties of triangles:

Relation between sides and angles of a triangle- sine rule, cosine rule, tangent rule and projection rule-area of a triangle- problems.

11. Hyperbolic functions:

Definitions of hyperbolic functions, identities of hyperbolic functions, inverse hyperbolic functions and expression of inverse hyperbolic functions in terms of logarithms.

12. Complex Numbers:

Definition of a complex number, Modulus and conjugate of a complex number, Arithmetic operations on complex numbers, Modulus- Amplitude (polar) form, Exponential form (Euler form) of a complex number- Problems. DeMoivre's theorem.

UNIT-III
Coordinate geometry

- 13 Straight lines:** various forms of straight lines, angle between lines, perpendicular distance from a point, distance between parallel lines-examples.
- 14. Circle:** locus of a point, Circle, definition-Circle equation given (i) centre and radius, (ii) two ends of a diameter (iii) centre and a point on the circumference (iv) three non collinear points - general equation of a circle – finding centre, radius.
- 15.** Definition of a conic section, equation of a conic when focus directrix and eccentricity are given. properties of parabola, ellipse and hyperbola in standard forms.

UNIT-IV
Differential Calculus

- 16. Concept of Limit-** Definition- Properties of Limits and Standard Limits -Simple Problems- Continuity of a function at a point- Simple Examples only.
- 17. Concept of derivative-** Definition (first principle)- different notations-derivatives of elementary functions- problems. Derivatives of sum, product, quotient, scalar multiplication of functions - problems. Chain rule, derivatives of inverse trigonometric functions, derivative of a function with respect to another function, derivative of parametric functions, derivative of hyperbolic, implicit functions, logarithmic differentiation – problems in each case. Higher order derivatives - examples – functions of several variables - partial differentiation, Euler’s theorem-simple problems.

UNIT-V
Applications of Derivatives

- 18.** Geometrical meaning of the derivative, equations of Tangent and normal to a curve at any point. Lengths of tangent, normal, sub tangent and subnormal to the curve at any point - problems.
- 19.** Physical applications of the derivative – velocity, acceleration, derivative as a rate measure –Problems.
- 20.** Applications of the derivative to find the extreme values – Increasing and decreasing functions, finding the maxima and minima of simple functions - problems leading to applications of maxima and minima.
- 21.** Using the concept of derivative of a function of single variable, find the absolute error, relative and percentage errors and approximate values due to errors in measuring.

Textbook:

Engineering Mathematics-I, a textbook for first year diploma courses, prepared & prescribed by SBTET, AP.

Reference Books:

1. Shanti Narayan, A Textbook of matrices, S.Chand&Co.
2. Robert E. Moyer & Frank Ayers Jr., Schaum's Outline of Trigonometry, 4th Edition, Schaum's Series
3. M.Vygodsky, Mathematical Handbook, Mir Publishers, Moscow.
4. Frank Ayers & Elliott Mendelson, Schaum's Outline of Calculus, Schaum's Series

Engineering Mathematics – I Blue print:

S. No	Chapter/ Unit title	No of Periods		Weightage Allotted	Marks wise distribution of weightage				Question wise distribution of weightage				COs mapped
		Theory	Practice		R	U	Ap	An	R	U	Ap	An	
	Unit - I : Algebra												
1	Relations and Functions	4	2	3	0	3	0	0	0	1	0	0	CO 1
2	Partial Fractions	3	2	3	0	3	0	0	0	1	0	0	CO 1
3	Matrices and Determinants	10	10	11	3	0	8	0	1	0	1	0	CO 1
	Unit - II : Trigonometry												
4	Trigonometric Ratios	1	1	0	0	0	0	0	0	0	0	0	CO2
5	Compound Angles	3	2	3	3	0	0	0	1	0	0	0	CO2
6	Multiple and Submultiple angles	4	4	3	0	3	0	0	0	1	0	0	CO2
7	Transformations	3	3	8	0	8	0	0	0	1	0	0	CO2
8	Inverse Trigonometric Functions	3	2										
9	Trigonometric Equations	3	2	8	0	0	8	0	0	0	1	0	CO2
10	Properties of triangles	3	2										
11	Hyperbolic Functions	1	1	0	0	0	0	0	0	0	0	0	CO2
12	Complex Numbers	4	2	3	3	0	0	0	1	0	0	0	CO2
	Unit III : Co-ordinate Geometry												
13	Straight Lines	4	2	3	3	0	0	0	1	0	0	0	CO3
14	Circle	3	2	8	0	8	0	0	0	1	0	0	CO3
15	Conic Sections	8	4										
	Unit – IV : Differential Calculus												

16	Limits and Continuity	4	2	3	0	3	0	0	0	1	0	0	CO4
17	Differentiation	17	10	14	3	11	0	0	1	2	0	0	CO4
Unit - V : Applications of Differentiation													
18	Geometrical Applications	3	2	10	0	0	0	10	0	0	0	1	CO5
19	Physical Applications	2	2										
20	Maxima and Minima	3	4										
21	Errors and Approximations	2	1										
Total		89	61	80	15	39	16	10	5	8	2	1	

R: Remembering Type : 15 Marks
U: understanding Type : 39 Marks
Ap: Application Type : 16 Marks
An: Analysing Type : 10 Marks

Engineering Mathematics – I
Unit Test Syllabus

Unit Test	Syllabus
Unit Test-I	From L.O. 1.1 to L.O. 2.11
Unit Test-II	From L.O. 2.12 to L.O. 3.10
Unit Test-III	From L.O.4.1 to L.O. 5.10

Unit Test I

C –20, AG -102

State Board of Technical Education and Training, A. P

First Year

Subject name: Engineering Mathematics-I

Sub Code: AG-102

Time : 90 minutes

Max.marks:40

Part-A

16Marks

Instructions: (1) Answer all questions.

(2) First question carries four marks and the remaining questions carry three marks each.

1. Answer the following.

a. If $f(x) = x^2$ and domain = $\{-1, 0, 1\}$, then find range. (CO1)

b. If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$, then find $3A$. (CO1)

c. Write the value of $\sin 120^\circ$ (CO2)

d. Write the formula for $\tan 2A$ in terms of $\tan A$ (CO2)

2. If $f : R \rightarrow R$ is defined by $f(x) = 3x - 5$, then prove that $f(x)$ is onto. (CO1)

3. If $A = \begin{bmatrix} 1 & 3 \\ 4 & -9 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 4 \\ -3 & 1 \end{bmatrix}$ then find $2A + 3B$ (CO1)

4. Prove that $\sin^2 45^\circ - \sin^2 15^\circ = \frac{\sqrt{3}}{4}$ (CO2)

5. Prove that $\frac{\sin 2A}{1 - \cos 2A} = \cot A$ (CO2)

Part-B

3×8=24

Instructions: (1) Answer all questions.

(2) Each question carries eight marks

(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

6. A) Resolve $\frac{2x}{(x-1)(x-3)}$ into partial fractions. **(CO1)**

or

B) Resolve $\frac{x+4}{x^2-3x+2}$ into partial fractions. **(CO1)**

7. A) Using Cramer's rule to solve

$$x - y + z = 2, 2x + 3y - 4z = -4, 3x + y + z = 8 \text{ (CO1)}$$

or

B) Prove that $\begin{vmatrix} bc & b+c & 1 \\ ca & c+a & 1 \\ ab & a+b & 1 \end{vmatrix} = (a-b)(b-c)(c-a)$ **(CO1)**

8. A) Find the adjoint of Matrix $\begin{bmatrix} 1 & 2 & -2 \\ -1 & 3 & 5 \\ 2 & 7 & -4 \end{bmatrix}$ **(CO1)**

or

B) If $A = \begin{bmatrix} 2 & 3 & 4 \\ 5 & 7 & 9 \\ -2 & 1 & 3 \end{bmatrix}$; $B = \begin{bmatrix} 3 & 1 & -5 \\ 2 & 1 & 4 \\ 0 & 3 & 1 \end{bmatrix}$, find AB and BA and verify if $AB = BA$.

(CO1)

Unit Test II
State Board of Technical Education and Training, A. P
First Year
Subject name: **Engineering Mathematics-I**
Sub Code: **AG- 102**

C –20, AG -102

Time : 90 minutes

Max.marks:40

Part-A

16Marks

Instructions: (1) Answer all questions.

(2) First question carries four marks and the remaining questions carry three marks each

1. Answer the following.

a. $\sin C + \sin D = 2 \cos\left(\frac{C+D}{2}\right) \sin\left(\frac{C-D}{2}\right)$: State TRUE/FALSE (CO2)

b. If $z = 2 + 3i$, then find $|z|$ (CO2)

c. $\sinh x = \frac{e^x - e^{-x}}{2}$: State TRUE/FALSE (CO2)

d. Write the eccentricity of rectangular hyperbola. (CO3)

2. Express $(3 - 4i)(7 + 2i)$ in terms of $a + ib$ (CO2)

3. Find the perpendicular distance from (1,1) to the line $2x + 3y - 1 = 0$ (CO3)

4. Find the angle between lines $2x - y + 3 = 0$ and $x + y - 2 = 0$ (CO3)

5. Find the centre and radius of the circle $x^2 + y^2 - 2x + 4y - 4 = 0$ (CO3)

Part-B

3×8=24

Instructions: (1) Answer all questions.

(2) Each question carries eight marks

(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

6. A) Prove that $\frac{\sin 2\theta + \sin 4\theta + \sin 6\theta}{\cos 2\theta + \cos 4\theta + \cos 6\theta} = \tan 4\theta$. (CO2)

or

B) Prove that $\tan^{-1} \frac{1}{2} + \tan^{-1} \frac{1}{5} + \tan^{-1} \frac{1}{8} = \frac{\pi}{4}$ **(CO2)**

7. A) Solve $2\sin^2 \theta - \sin \theta - 1 = 0$ **(CO2)**
or

B) In any $\triangle ABC$, if $\angle B = 60^\circ$ then $\frac{c}{a+b} + \frac{a}{b+c} = 1$ **(CO2)**

8. A) Find the equation of circle with $(2, 3)$ and $(6, 9)$ as the end points of diameter and also find centre and radius of circle. **(CO3)**

or

B) Find the equation of ellipse whose focus is $(1, -1)$, directrix is $x - y + 3 = 0$ and eccentricity is $1/2$. **(CO3)**

Unit Test III

C –20, AG -102

State Board of Technical Education and Training, A. P

First Year

Subject name: **Engineering Mathematics-I**

Sub Code: **AG-102**

Time : 90 minutes

Max.marks:40

Part-A

16Marks

Instructions: (1) Answer all questions.

(2) First question carries four marks and the remaining questions carry three marks each

1. Answer the following.

a. Find $\lim_{x \rightarrow 1} \frac{x^2 + 1}{x + 5}$ (CO4)

b. $\lim_{\theta \rightarrow 0} \frac{\sin 2\theta}{\theta} = 2$: State TRUE/FALSE (CO4)

c. $\frac{d}{dx} (3 \tan^{-1} x) = ?$ (CO4)

d. Formula for percentage error in x is _____ (CO5)

2. Evaluate $\lim_{x \rightarrow 2} \frac{x^5 - 32}{x^2 - 4}$ (CO4)

3. Find the derivative of $3 \tan x - 4 \log x + 7^x$ w.r.t. x (CO4)

4. Differentiate $x^2 \sin x$ w.r.t. x (CO4)

5. Find the derivative of $\frac{2x+3}{3x+4}$ (CO4)

Part-B

3×8=24

Instructions: (1) Answer all questions.

(2) Each question carries eight marks

(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

6. A) Find the derivative of $\sin^{-1}\left(\frac{2x}{1+x^2}\right)$ w.r.t. $\tan^{-1}\left(\frac{2x}{1-x^2}\right)$. **(CO4)**

or

B) Find $\frac{dy}{dx}$ if $y = x^{\cos x}$ **(CO4)**

7. A) Verify Euler's theorem when $u(x, y) = \frac{x^4 + y^4}{x - y}$ **(CO4)**

or

B) Find the equation of tangent and normal to the curve $3y = x^2 - 6x + 17$ at $(4, 3)$ **(CO5)**

8. A) Circular patch of oil spreads on water and the area is growing at the rate of $8 \text{ sqcm} / \text{min}$. How fast is the radius increasing when radius is 5 cm . **(CO5)**

or

B) Find the maxima and minima values of $f(x) = x^3 - 6x^2 + 9x + 15$. **(CO5)**

END-EXAM MODEL PAPERS

STATE BOARD OF TECHNICAL EDUCATION, A.P
ENGINEERING MATHEMATICS AG- 102

TIME : 3 HOURS

MODEL PAPER- I

MAX.MARKS : 80M

PART-A

Answer All questions. Each question carries THREE marks.

10x3=30M

1. If $A = \left\{0, \frac{\pi}{6}, \frac{\pi}{4}, \frac{\pi}{3}, \frac{\pi}{2}\right\}$ and $f : A \rightarrow B$ is a function such that $f(x) = \cos x$, then find the range of f .

(CO 1)

2. Resolve the function $\frac{x}{(x-1)(x-2)}$ into partial fractions. (CO 1)

3. If $A = \begin{bmatrix} 3 & 9 & 0 \\ 1 & 8 & -2 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & 0 & 2 \\ 7 & 1 & 4 \end{bmatrix}$, find $A+B$ and $A-B$. (CO 1)

4. Show that $\frac{\cos 16^\circ + \sin 16^\circ}{\cos 16^\circ - \sin 16^\circ} = \tan 61^\circ$. (CO2)

5. Prove that $\frac{\sin 2\theta}{1 - \cos 2\theta} = \cot \theta$. (CO2)

6. Find the modulus of the complex number $\left(\frac{1-i}{2+i}\right)$. (CO2)

7. Find the distance between parallel lines $x+2y+3=0$ and $x+2y+8=0$. (CO3)

8. Find $\lim_{x \rightarrow 0} \frac{\sin 77x}{\sin 11x}$. (CO4)

9. Differentiate $3 \tan x - 4 \log x - 7x^2$ w.r.t. x . (CO4)

10. If $x = at^2$, $y = 2at$, then find $\frac{dy}{dx}$. (CO4)

PART-B

Answer All questions. Each question carries EIGHT marks.

5x8=40M

11 A) Find the inverse of the matrix $\begin{bmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$. (CO 1)

Or

B) Solve the system of equations $x+y+z=6$, $x-y+z=2$ and $2x-y+3z=9$ by Cramer's rule. (CO 1)

12 A) If $\cos x + \cos y = \frac{3}{5}$ and $\cos x - \cos y = \frac{2}{7}$, then show that

$21 \tan\left(\frac{x-y}{2}\right) + 10 \cot\left(\frac{x+y}{2}\right) = 0$. (CO2)

Or

B) If $\tan^{-1} x + \tan^{-1} y + \tan^{-1} z = \pi$ then show that $x + y + z = xyz$. **(CO2)**

13 A) Solve $\sqrt{3}\cos\theta - \sin\theta = 1$. **(CO2)**

Or

B) In any ΔABC , Show that $\cot\frac{A}{2} + \cot\frac{B}{2} + \cot\frac{C}{2} = \frac{s^2}{\Delta}$. **(CO2)**

14 A) Find the equation of the circle with $(4,2)$ and $(1,5)$ as the two ends of its diameter and also find its centre and radius. **(CO3)**

Or

B) Find the centre, vertices, equation of axes, lengths of axes, eccentricity, foci, equations of directrices and length of latus rectum of the ellipse $4x^2 + 16y^2 = 1$. **CO 3**

15 A) Find the derivative of $\sin^{-1}\left(\frac{2x}{1+x^2}\right)$ w.r.t. $\tan^{-1}\left(\frac{2x}{1-x^2}\right)$ **(CO4)**

Or

B) If $u = \tan^{-1}\left(\frac{x^3 - y^3}{x + y}\right)$, then prove that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = \sin 2u$. **(CO4)**

PART-C

Answer the following question. Question carries TEN marks.

1x10=10M

16. The sum of two numbers is 24. Find them so that the sum of their squares is minimum. **(CO5)**

STATE BOARD OF TECHNICAL EDUCATION, A.P
ENGINEERING MATHEMATICS AG- 102

TIME : 3 HOURS

MODEL PAPER- II

MAX.MARKS : 80M

PART-A

Answer All questions. Each question carries THREE marks.

10x3=30M

1. If $f : R \rightarrow R$ is a bijective function such that $f(x) = ax + b$, then find $f^{-1}(x)$. **CO 1**
2. Resolve the function $\frac{1}{(x+1)(x-2)}$ into partial fractions. **CO 1**
3. If $A = \begin{bmatrix} 0 & -1 & 3 \\ 1 & 0 & 7 \\ -3 & x & 0 \end{bmatrix}$ is a skew-symmetric matrix, find the value of x . **CO 1**
4. Find the value of $\sin^2 82 \frac{1}{2} - \sin^2 22 \frac{1}{2}$. **CO2**
5. Prove that $\frac{\cos 3A}{2\cos 2A - 1} = \cos A$. **CO2**
6. Find the conjugate of the complex number $(3-2i).(4+7i)$ **CO2**
7. Find the equation of the line passing through the points $(1,2)$ and $(3,-4)$. **CO3**
8. Find $\lim_{x \rightarrow 2} \frac{x^5 - 32}{x - 2}$. **CO4**
9. Differentiate $\sqrt{x} - \sec x + \log x$ w.r.t. x . **CO4**
10. If $u(x, y) = x^3 - 3axy + y^3$, then find $\frac{\partial u}{\partial x}$ and $\frac{\partial u}{\partial y}$. **CO4**

PART-B

Answer All questions. Each question carries EIGHT marks. 5x8=40M

11 A) Show that $\begin{vmatrix} 1 & 1 & 1 \\ a & b & c \\ a^2 & b^2 & c^2 \end{vmatrix} = (a-b)(b-c)(c-a)$. **CO1**

Or

B) Solve the system of equations $x + 2y + 3z = 6, 3x - 2y + 4z = 5$ and $x - y - z = -1$ using matrix inversion method. **CO1**

12 A) Prove that $\frac{\sin 2\theta + \sin 4\theta + \sin 6\theta}{\cos 2\theta + \cos 4\theta + \cos 6\theta} = \tan 4\theta$. **CO2**

Or

B) Prove that $\tan^{-1} \frac{1}{3} + \tan^{-1} \frac{1}{5} + \tan^{-1} \frac{1}{7} + \tan^{-1} \frac{1}{8} = \frac{\pi}{4}$. **CO2**

13 A) Solve $2\cos^2 \theta - 3\cos \theta + 1 = 0$. **CO2**

Or

B) In any ΔABC , Show that $\sum a^3 \cos(B-C) = 3abc$. **CO2**

14 A) Find the equation of the circle passing through the points $(0,0)$, $(6,0)$ and $(0,8)$. **CO3**

Or

B) Find the equation of the rectangular hyperbola whose focus is $(1,2)$ and directrix is $3x+4y-5=0$. **CO3**

15 A) If $\sin y = x \sin(a+y)$, then prove that $\frac{dy}{dx} = \frac{\sin^2(a+y)}{\sin a}$. **CO4**

Or

B) If $y = \tan^{-1} x$, then prove that $(1+x^2)y_2 + 2xy_1 = 0$. **CO4**

PART-C

Answer the following question. Question carries TEN marks. 1x10=10M

16 Show that the semi-vertical angle of the cone of maximum volume and of given slant height is $\tan^{-1} \sqrt{2}$. **CO4**

Course code	Course Title	No. of Periods per week	Total No. of Periods	Marks for FA	Marks for SA
AG-103	Engineering Physics	4	120	20	80

S. No	Unit Title/Chapter	No of Periods	COs Mapped
1	Units and Dimensions	08	CO1
2	Elements of Vectors	12	CO1
3	Dynamics	12	CO2
4	Friction	10	CO2
5	Work, Power and Energy	12	CO3
6	Simple harmonic motion	12	CO3
7	Heat and Thermodynamics	12	CO4
8	Sound	10	CO4
9	Properties of matter	10	CO5
10	Electricity and Magnetism	12	CO5
11	Modern physics	10	CO5
Total		120	

Course Title: Engineering Physics	
Course Objectives	<ol style="list-style-type: none"> 1. To familiarize with the concepts of Physics involved in the process of various Engineering, Industrial and Daily life Applications. 2. To understand and apply the basic principles of physics in the field of engineering and technology to familiarize certain natural phenomenon occurring in the day to day life 3. To reinforce theoretical concepts by conducting relevant experiments/exercises

Course Outcomes	CO1	Explain S.I units and dimensions of different physical quantities, basic operations among vector quantities.
	CO2	Explain the motion of objects moving in one dimension and two dimensions, the causes of motion and hindrance to the motion of the objects especially with respect to friction.
	CO3	Explain the mechanical energy of bodies like PE, KE and conservation law of energy, the properties of simple harmonic motion.
	CO4	Explain gas laws, ideal gas equation, Isothermal and adiabatic processes, Specific heats, to study the laws of thermodynamics. Causes, consequences and methods to minimise noise pollution, explain beats, Doppler effect, Reverberation, echoes.
	CO5	Explain certain properties of solids, liquids like elastic properties, viscosity and surface tension. Explain Ohm's law, to study Kirchoff's laws, to study the principle of Wheatstone's bridge and its application to meter bridge. To study the magnetic force and understand magnetic field. To compute magnetic field strength on axial and equatorial lines of a bar magnet. To familiarise with modern topics like photoelectric effect, optical fibres, superconductivity and nanotechnology.

COS, POS, PSOS MAPPING

- POs mapping strength (as per given table)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3					1		1	1	1
CO2	3		2					1	1	
CO3	3		2					1		
CO4	3	2			2				2	2
CO5	3			2			2	1	1	

3 = strongly mapped 2= moderately mapped 1= slightly mapped

Note:The gaps in CO and PO mapping will be achieved by one or more appropriate activities from the following:i) Seminars ii) Tutorials iii) Guest lectures iv) Assignments v) Quiz competitions vi) Industrial visits vii) Tech Fest viii) Mini project ix) Group discussion x) Virtual classes xi) Library visit for e-books

Learning Outcomes

1.0 Concept of Units and dimensions

- 1.1 Explain the concept of Units, Physical quantity, Fundamental physical quantities and Derived physical quantities
- 1.2 Define unit, fundamental units and derived units, State SI units with symbols
- 1.3 State Multiples and submultiples in SI system, State Rules of writing S.I. units, State advantages of SI units
- 1.4 Define Dimensions, Write Dimensional formulae of physical quantities
- 1.5 List dimensional constants and dimensionless quantities

- 1.6 State the principle of homogeneity of dimensions
- 1.7 State the applications and limitations of dimensional analysis
- 1.8 Errors in measurement, Absolute error, relative error, percentage error, significant figures
- 1.9 Solve problems

2.0 Concept of Elements of Vectors

- 2.1 Explain the concept of scalars, Vectors and give examples
- 2.2 Represent vectors graphically, Classify the Vectors, Resolve the vectors
- 2.3 Determine the resultant of a vector by component method, represent a vector in Space using unit vectors (i, j, k)
- 2.4 State and explain triangle law, parallelogram law, and polygon law of addition of Vectors
- 2.5 Define Dot product of two vectors with examples (Work done, Power), mention the Properties of dot product
- 2.6 Define cross product of two vectors with examples (Torque, Linear velocity) Mention the properties of Cross product.
- 2.7 Solve the related numerical problems

3.0 Concept of Dynamics

- 3.1 Write the equations of motion in a straight line. Explain the acceleration due to Gravity.
- 3.2 Explain vertical motion of a body and derive expressions for a) Maximum Height, b) Time of ascent, c) time of descent, and d) time of flight
- 3.3 Derive height of a tower when a body projected vertically upwards from the top of a tower.
- 3.4 Explain projectile motion with examples
- 3.5 Explain horizontal projection and derive an expression for the path of a projectile in horizontal projection
- 3.6 Explain oblique projection and derive an expression for it. Derive formulae for a) Maximum Height b) time of ascent c) time of descent and d) time of flight e) Horizontal Range, f) Maximum range
- 3.7 Define force, momentum, angular displacement, angular velocity, angular acceleration, angular momentum, moment of inertia, torque
- 3.8 Solve the related numerical problems

4.0 Concept of Friction

- 4.1 Define friction and classify the types of friction.
- 4.2 Explain the concept of normal reaction.
- 4.3 State the laws of friction.
- 4.4 Define coefficients of friction, Angle of friction and angle of repose.
- 4.5 Derive expressions for acceleration of a body on a rough inclined plane. (Upwards and downwards)
- 4.6 List the advantages and disadvantages of friction.
- 4.7 Mention the methods of minimizing friction.
- 4.8 Explain why it is easy to pull a lawn roller than to push it.
- 4.9 Solve the related numerical problems.

5.0 Concepts of Work, Power, and Energy

- 5.1 Define the terms Work, Power and Energy. State SI units and dimensional

Formulae.

5.2 Define potential energy and give examples, derive an expression for potential energy.

5.3 Define Kinetic energy and give examples, derive an expression for kinetic energy.

5.4 State and derive Work-Energy theorem.

5.5 Derive the relation between Kinetic energy and momentum.

5.6 State the law of conservation of energy and verify it in the case of a freely falling body.

5.7 Solve the related numerical problems.

6.0 Concepts of Simple harmonic motion

6.1 Define Simple harmonic motion, Give examples, state the conditions.

6.2 Explanation of uniform circular motion of a particle is a combination of two perpendicular S.H.M.s.

6.3 Derive expressions for displacement, velocity, acceleration, Frequency, Time period of a particle executing SHM.

6.4 Define phase of SHM.

6.5 Define Ideal simple pendulum and derive expression for time period of simple pendulum.

6.6 State the laws of motion of simple pendulum.

6.7 Solve the related numerical problems.

7.0 Concept of heat and thermodynamics

7.1 Explain the concept of expansion of gases

7.2 State and explain Boyle's and Charles laws.

7.3 Define absolute zero temperature, absolute scale of temperature

7.4 Define ideal gas and distinguish from real gas

7.5 Derive Ideal gas equation. Define specific gas constant and universal gas constant, write S.I unit and dimensional formula. Calculate the value of R.

7.6 Explain why universal gas constant is same for all gases

7.7 State and explain isothermal process and adiabatic process

7.8 State first and second laws of thermodynamics and state applications

7.9 Define specific heats and molar specific heats of a gas, Derive $C_p - C_v = R$

7.10 Solve the relevant numerical problems

8.0 Concept of Sound

8.1 Concept of the sound, Wave motion. (longitudinal and transverse wave)

8.2 Distinguish between musical sound and noise.

8.3 Explain noise pollution and state SI unit for intensity level of sound.

8.4 Explain causes, effects and methods of minimizing of noise pollution.

8.5 Explain the phenomenon of beats state the applications.

8.6 Define Doppler effect, list the applications.

8.7 Define reverberation and reverberation time and write Sabine's formula.

8.8 Define and explain echoes state its applications.

8.9 State conditions of good auditorium.

8.10 Solve the related numerical problems.

9.0 Concepts of properties of matter

- 9.1 Explain the terms elasticity, stress, strain and types of stress and strain.
- 9.2 State and explain Hooke's law.
- 9.3 Definitions of Modulus of elasticity, Young's modulus (Y), Bulk modulus (K), Rigidity modulus (n), Poisson's ratio (σ),
- 9.4 Define surface tension and give examples.
- 9.5 Explain Surface tension with reference to molecular theory.
- 9.6 Define angle of contact and capillarity and write formula for Surface Tension.
- 9.7 Explain the concept of viscosity, give examples, write Newton's formula.
- 9.8 Define co-efficient of viscosity and write its units and dimensional formula and State Poiseuille's equation for Co-efficient of viscosity.
- 9.9 Explain the effect of temperature on viscosity of liquids and gases.
- 9.10 Solve the related numerical problems.

10. Concepts of Electricity and Magnetism

- 10.1 Explain Ohm's law in electricity and write the formula.
- 10.2 Define specific resistance, conductance and state their units.
- 10.3 Explain Kichoff's laws.
- 10.4 Describe Wheatstone's bridge with legible sketch.
- 10.5 Describe Meter Bridge for the determination of resistivity with a circuit diagram.
- 10.6 Explain the concept of magnetism. State the Coulomb's inverse square law of Magnetism.
- 10.7 Define magnetic field and magnetic lines of force and write the properties of magnetic lines of force.
- 10.8 Derive an expression for the moment of couple on a bar magnet placed in a uniform magnetic field.
- 10.9 Derive equations for Magnetic induction field strength at a point on the axial line and on the equatorial line of a bar magnet.
- 10.10 Solve the related numerical problems

11.0 Concepts of modern physics

- 11.1 State and explain Photo-electric effect and Write Einstein's photo electric Equation.
- 11.2 State laws of photo electric effect.
- 11.3 Explain the Working of photo electric cell, write its applications.
- 11.4 Recapitulation of refraction of light and its laws, critical angle, total Internal Reflection.
- 11.5 Explain the principle and working of Optical fiber, mention different types of Optical fiber, state the applications.
- 11.6 Define super conductor and super conductivity and mention examples.
- 11.7 State the properties of super conducting materials and list the applications.
- 11.8 Nanotechnology definition, nano materials, applications.

COURSE CONTENT

1. Units and Dimensions:

Introduction, Physical quantity, Fundamental and Derived quantities, Fundamental and Derived units, SI units, Multiples and Sub multiples, Rules for writing S.I. units, Advantages of SI units. Dimensions and Dimensional formulae, Dimensional constants and Dimensionless quantities, Principle of homogeneity, Advantages and limitations of dimensional analysis, Errors in measurement, Absolute

error, relative error, percentage error, significant figures, Problems.

2. Elements of Vectors:

Scalars and Vectors, Types of vectors (Proper Vector, Null Vector, Unit Vector, Equal, Negative Vector, Like Vectors, Co-Initial Vectors, Co-planar Vectors and Position Vector). Addition of vectors, Representation of vectors, Resolution of vectors, Parallelogram, Triangle and Polygon laws of vectors, Subtraction of vectors, Dot and Cross products of vectors-Problems.

3. Dynamics

Introduction-Concept of acceleration due to gravity-Equations of motion for a freely falling body and for a body thrown up vertically- Projectiles- Horizontal and Oblique projections- Expressions for maximum height, time of flight, range-Define force, momentum, angular displacement, angular velocity, angular acceleration, angular momentum, moment of inertia, torque-problems.

4. Friction:

Introduction to friction- Causes- Types of friction- Laws of friction- Angle of repose-Angle of friction- rough inclined plane- Advantages and disadvantages of friction-Methods of reducing friction-Problems.

5. Work, Power and Energy:

Work, Power and Energy- Definitions and explanation- potential energy- kinetic energy-Derivations of Potential and Kinetic energies-K.E and Momentum relation - Work-Energy theorem- Law of Conservation of energy- Problems.

6. Simple Harmonic Motion:

Introduction- Conditions of SHM- Definition- Examples- Expressions for displacement, velocity, acceleration, Time period, frequency and phase in SHM- Time period of a simple pendulum- Laws of simple pendulum-simple pendulum-Problems.

7. Heat and Thermodynamics:

Expansion of Gases, Boyle's law, absolute scale of temperature- Charles laws- Ideal gas equation- Universal gas constant- Differences between gas constant(r) and universal gas constant(R), Isothermal and adiabatic processes, Laws of thermodynamics, Specific heats - molar specific heats of a gas -Different modes of transmission of heat ,laws of thermal conductivity, Coefficient of thermal conductivity-Problems.

8. Sound:

Sound- Nature of sound- Types of wave motion -musical sound and noise- Noise pollution – Causes & effects- Methods of reducing noise pollution- Beats- Doppler effect- Echo- Reverberation- Reverberation time-Sabine's formula-Conditions of good auditorium- Problems.

9. Properties of matter

Definition of Elasticity –Definition of stress and strain -the units and dimensional formulae for stress and strain-The Hooke's law-Definitions of Modulus of elasticity, Young's modulus(Y), Bulk modulus(K), Rigidity modulus (n),Poisson's ratio (σ), relation between Y , K , n and σ (equations only no derivation)

Definition of surface tension-Explanation of Surface tension with reference to molecular theory - Definition

of angle of contact -Definition of capillarity -The formula for surface tension based on capillarity - Explanation of concept of Viscosity - Examples for surface tension and Viscosity - Newton's formula for viscous force- Definition of co-efficient of viscosity- The effect of temperature on viscosity of liquids and gases - Poiseuille's equation for Co-efficient of viscosity- The related numerical problems.

10. Electricity & Magnetism:

Ohm's law and explanation, Specific resistance, Kirchoff's laws, Wheatstone's bridge, Meter bridge, Coulomb's inverse square law, magnetic field, magnetic lines of force, magnetic induction field strength- magnetic induction field strength at a point on the axial line - magnetic induction field strength at a point on the equatorial line-problems.

11. Modern Physics;

Photoelectric effect -Einstein's photoelectric equation-laws of photoelectric effect-photoelectric cell- Applications of photo electric effect- Total internal reflection- fiber optics- -principle and working of an optical fiber-types of optical fibers - Applications of optical fibers- superconductivity-applications- Nanotechnology definition, nano materials, applications

REFERENCEBOOKS

- | | |
|--|------------------------------------|
| 1. Telugu Academy (English version) | Intermediate physics Volume-I & 2 |
| 2. Dr. S. L. Guptha and Sanjeev Guptha | Unified physics Volume 1,2,3 and 4 |
| 3. Resnick& Holiday | Text book of physics Volume I |
| 4. Dhanpath Roy | Text book of applied physics |
| 5. D.A Hill | Fiber optics |
| 6. XI & XII Standard | NCERT Text Books |

➤ Model Blue Print with Weightage for Blooms category and questions for chapter and Cos mapped

S. No	Unit Title/Chapter	No of Periods	Weight age of marks	Marks wise distribution of Weightage				Question wise distribution of Weightage				Mapped with CO
				R	U	Ap	An	R	U	Ap	An	
1	Units and Dimensions	08	03	3	0	0	0	1	0	0	0	CO1
2	Elements of Vectors	12	11	3	8	0	0	1	1	0	0	CO1
3	Dynamics	12	11	3	8	0	0	1	1	0	*	CO2
4	Friction	10	11	3	0	8	0	1	0	1	0	CO2
5	Work, Power and Energy	12	11	3	8	0	0	1	1	0	0	CO3
6	Simple harmonic motion	12	11	3	8	0	0	1	1	0	*	CO3

7	Heat and Thermodynamics	12	11	0	8	3	0	0	1	1	*	CO4
8	Sound	10	11	0	8	3	0	0	1	1	0	CO4
9	Properties of matter	10	08	0	8	0	0	0	1	0	0	CO5
10	Electricity and Magnetism	12	14	6	0	8	0	2	0	1	0	CO5
11	Modern physics	10	08	0	8	0	0	0	1	0	0	CO5
Total		120	110	24	64	22	0	8	8	4	* 10	

*One question of HOTs for 10 marks from any of the unit title 3 or 6 or 7

➤ Table specifying the scope of syllabus to be covered for Unit Tests

Unit Test	Learning outcomes to be covered
Unit Test – 1	From 1.1 to 4.9
Unit Test – 2	From 5.1 to 7.10
Unit Test – 3	From 8.1 to 11.8

- Model question paper for Unit Tests I,II,III with COs mapped

UNIT TEST –I
Model Question Paper (C-20)
ENGINEERING PHYSICS (AG-103)

TIME: 90 minutes

Total Marks: 40

PART-A

16 Marks

Instructions: (1) Answer all questions.

(2) First question carries 4 marks and others carry 3 marks each.

(3) Answers for the Question numbers 2 to 5 should be brief and straight to the point and shall not exceed five simple sentences.

1. i) The dimensional formula of force is _____ **(CO1)**
ii) Which of the following is a scalar [] **(CO1)**
a) force b) work c) displacement d) velocity
iii) we can add a scalar to a vector (Yes / No) **(CO1)**
iv) Friction is a self-adjusting force. [True / False] **(CO2)**
2. Define dot product. Give one example. **(CO1)**
3. A force of 150 N acts on a particle at an angle of 30° to the horizontal. Find the horizontal and vertical components of force. **(CO1)**
4. Define projectile. Give two examples. **(CO2)**
5. It is easier to pull a lawn roller than to push it. Explain **(CO2)**

PART—B

3x8=24

Instructions: (1) Answer all questions. Each question carries 8marks.

(2) Answer should be comprehensive and the criteria for evaluation is content but not the length of the answer.

- 6) (A) Derive an expression for magnitude and direction of resultant of two Vectors using parallelogram law of vectors **(CO1)**

OR

(B) Write any four properties of dot product and any four properties of Cross product **(CO1)**

- 7) (A) Show that path of a projectile is a parabola in case of oblique Projection. **(CO2)**

OR

(B) Derive the expression for range and time of flight of a projectile **(CO2)**

8) (A) State and explain polygon law of vector addition with a neat diagram **(CO1)**

OR

(B) Derive the equation for acceleration of a body on a rough inclined plane **(CO2)**

UNIT TEST –II
Model Question Paper (C-20)
ENGINEERING PHYSICS (AG–103)

TIME: 90 minutes

Total Marks: 40

PART –A

16 Marks

Instructions: (1) Answer all questions.

(2) First question carries 4 marks and others carry 3 marks each.

(3) Answers for the Question numbers 2 to 5 should be brief and

Straight to the point and shall not exceed five simple sentences.

- 1) i) The value of 100°C is equal to _____ in Kelvin scale of temperature **(CO4)**
ii) Write the S.I unit of power **(CO3)**
iii) A simple pendulum be used in artificial satellite (Yes / No) **(CO3)**
iv) Specific heat of a gas is constant for all gases in nature [True / False] **(CO4)**
2. Derive the relation between momentum and kinetic energy **(CO3)**
3. A girl is swinging by sitting in a swing, how the frequency changes if she stands in the swing. **(CO3)**
4. Write the physical significance of universal gas constant. **(CO4)**
5. A body is projected in to the air in the vertically upward direction, find the height at which its potential and kinetic energies are equal. **(CO3)**

PART—B

3x8=24 Marks

Instructions: (1) Answer all questions. Each question carries 8marks.

(2) Answer should be comprehensive and the criteria for evaluation is content but not the length of the answer.

6) (A) State the law of conservation of energy and verify it in case of a freely falling body. **(CO3)**

(OR)

(B) State and prove work energy theorem. **(CO3)**

7) (A) Define ideal simple pendulum and derive the equation for time period

of a simple pendulum **(CO3)**

OR

(B) State the conditions for S.H.M, derive the equation for velocity for a Particle in S.H.M. **(CO3)**

8) (A) Define ideal gas, show that for an ideal gas the difference in specific heats is equal to universal gas constant **(CO4)**

(OR)

(B) State gas laws and derive the ideal gas equation **(CO4)**

UNIT TEST –III
Model Question Paper (C-20)
ENGINEERING PHYSICS (AG–103)

TIME: 90 minutes

Total Marks: 40

PART –A

16 Marks

Instructions: (1) Answer all questions.

(2) First question carries 4 marks and others carry 3 marks each.

(3) Answers for the Question numbers 2 to 5 should be brief and straight to the point and shall not exceed five simple sentences.

1) i) Photo electric cell converts light energy in to _____ energy **(CO5)**

ii) What is elastic limit ? **(CO5)**

iii) SI unit of Specific resistance is ----- **(CO5)**

iv) Inside a bar magnet magnetic line of force will travel from North pole to South pole

[True / False] **(CO5)**

2. Distinguish between Musical sound and Noise **(CO4)**

3. What is the effect of temperature on Viscosity of liquids and gases **(CO5)**

4. The values of resistances P, Q, R are 50 Ω , 10 Ω , 15 Ω respectively in the balanced condition of Wheatstone bridge, find the unknown resistance **(CO5)**

5. What is nanotechnology and write any two uses. **(CO5)**

PART –B

3x8=24 Marks

Instructions: (1) Answer all questions. Each question carries 8marks.

(2) Answer should be comprehensive and the criteria for evaluation is content but not the length of the answer.

6) (A) Explain Surface Tension based on the molecular theory **(CO5)**

(OR)

(B) Define Reverberation and Reverberation Time. Derive Sabine formula for reverberation time. **(CO4)**

7) (A) Derive the balancing condition of Wheatstone bridge with neat circuit Diagram. **(CO5)**

(OR)

(B) Derive an expression for the magnetic induction field strength at a point on the equatorial line of a bar magnet. **(CO5)**

8) (A) Describe an experiment to determine the specific resistance of a wire using meter bridge. **(CO5)**

(OR)

(B) Explain the principle and working of an optical fiber. **(CO5)**

BOARD DIPLOMA EXAMINATION, (C-20)

FIRST YEAR EXAMINATION

AG-103, ENGINEERING PHYSICS

Time : 3 hours]

[Total Marks : 80M

PART—A

3×10=30

Instructions: (1) Answer all questions.
(2) Each question carries three marks.
(3) Answers should be brief and straight to the point and shall not exceed five simple Sentences.

- Write the dimensional formula of the following physical quantities **(CO1)**
(a) Velocity (b) Force (c) Angular momentum
- Write any three properties of scalar product. **(CO1)**
- Define projectile. Give two examples. **(CO2)**
- It is easier to pull a lawn roller than to push it. Explain. **(CO2)**
- Define potential energy and kinetic energy. **(CO3)**
- For a body in simple harmonic motion velocity at mean position is 4m/s, if the time period is 3.14 s, find its amplitude. **(CO3)**
- State first and second laws of thermodynamics. **(CO4)**
- Write any three conditions of good auditorium **(CO4)**
- Define ohmic and non-ohmic conductors. **(CO5)**
- State Coulomb's inverse square law of magnetism. **(CO5)**

PART—B

8 ×5= 40

Instructions: (1) Each question carries eight marks.

(2) Answers should be comprehensive and the criterion for valuation is the content Butnot the length of the answer.

11. A) Derive an expression for magnitude and direction of the resultant of two vectors using Parallelogram law of vectors. **(CO1)**

OR

B) Show that path of a projectile is parabola in case of oblique projection and derive expression for maximum height. **(CO2)**

12. A) Derive expression for acceleration of a body sliding downwards on a rough inclined plane. **(CO2)**

OR

B) Verify the law of conservation of energy in case of a freely falling body. **(CO3)**

13. A) Derive an expression for velocity and acceleration of a particle performing simple harmonic Motion. **(CO3)**

OR

B) Define ideal gas and derive ideal gas equation. **(CO4)**

14. A) Two tuning forks A and B produce 4 beats per second. On loading B with wax 6 beats are produced. If the quantity of wax is reduced the number of beats drops to 4. If the frequency of A is 326 Hz, find the frequency of B. **(CO4)**

OR

B) Explain surface tension based on molecular theory. Write three examples of surface tension. **(CO5)**

15. A) Derive an expression for balancing condition of Wheat stone's bridge with a neat circuit diagram. **(CO5)**

OR

B) Explain principle and working of optical fibers. Write any three applications. **(CO5)**

PART C

1 x 10 = 10

16) Derive relationship between molar specific heat of a gas at constant pressure C_p and molar specific heat of a gas at constant volume C_v and hence show that C_p is greater than C_v . **(CO4)**

Course code	Course Title	No. of Periods per week	Total No. of Periods	Marks for FA	Marks for SA
AG-104	Engineering Chemistry and Environmental Studies	4	120	20	80

S.No	Unit Title/Chapter	No of Periods	COs Mapped
1	Fundamentals of Chemistry	18	CO1
2	Solutions	10	CO1
3	Acids and bases	10	CO1
4	Principles of Metallurgy	8	CO1
5	Electrochemistry	16	CO2
6	Corrosion	8	CO2
7	Water Treatment	10	CO3
8	Polymers	12	CO4
9	Fuels	6	CO4
10	Chemistry in daily life	6	CO4
11	Environmental Studies	16	CO5
	Total	120	

➤ **Course Objectives**

Course Title: Engineering Chemistry & Environmental Studies

Course Objectives	<ol style="list-style-type: none"> 1. To familiarize with the concepts of chemistry involved in the process of various Engineering Industrial Applications. 2. To know the various natural and man-made environmental issues and concerns with an interdisciplinary approach that include physical, chemical, biological and socio cultural aspects of environment. 3. To reinforce theoretical concepts by conducting relevant experiments/exercises
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➤ **Course outcomes**

Course Outcomes	CO1	Explain Bohr's atomic model, chemical bonding, mole concept, acids and bases, P ^H metallurgical process and alloys
	CO2	Explain electrolysis, Galvanic cell, emf and corrosion
	CO3	Explain the chemistry involved in the treatment of water by advanced method
	CO4	Synthesise of Plastics, rubber and applications of fuel chemical compounds used in our daily life.
	CO5	Explain the causes, effects and control methods of air and water pollution and measures to protect the environment

Course code AG-104	Chemistry and Environmental studies Cos;5			periods 120
	Mapped with CO No	CO periods addressing PO in Col 1 NO	Level 1,2,3	remarks
	CO1,CO2,CO3, CO4,CO5			>40% level 3 (highly addressed) 25% to 40% level2(moderately addressed) 5% to 25% level1 (Low addressed < 5%(not addressed)
	CO1,CO2			
	CO2,CO3			
	CO1			
	CO4,CO5			

➤ COs-POs mapping strength (as per given table)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	1		1				1	1	

CO2	3	1	2					1	1	
CO3	3		2							
CO4	3				1		2			
CO5	3				3			1		

3 = strongly mapped

2= moderately mapped

1= slightly mapped

Note: The gaps in CO and PO mapping will be achieved by one or more appropriate activities from the following:i) Seminars ii) Tutorials iii) Guest Lectures iv) Assignments v) Quiz competitions vi) Industrial visit vii) Tech Fest viii) Mini project ix) Group discussions x) Virtual classes xi) Library visit for e-books

➤ **Model Blue Print with Weightage for Blooms category and questions for each chapter and COs mapped**

S.No	Unit Title/Chapter	No of Periods	Weight age of marks	Marks wise distribution of Weightage				Question wise distribution of Weightage				Mapped with CO
				R	U	Ap	An	R	U	Ap	An	
1	Fundamentals of Chemistry	18	19	8	8	3		1	1	1		CO1
2	Solutions	10	11	0	0	8	3			1	1	CO1
3	Acids and bases	10	11	0	8	0	3		1		1	CO1
4	Principles of Metallurgy	8	8	8	0	0		1				CO1
5	Electrochemistry	16	11	8	3	0		1	1		*	CO2
6	Corrosion	8	8	0	8	0			1			CO2
7	Water Treatment	10	11	8	3	0		1	1			CO3
8	Polymers	12	11	3	8	0		1	1		*	CO4
9	Fuels	6	3	3	0	0		1				CO4
10	Chemistry in daily life	6	3	0	0	3				1		CO4
11	Environmental Studies	16	14	3	11	0		1	2			CO5
Total		120	110	12	6	6	6	20	35	5	* 10	

*One question of HOTs for 10 marks from any of the unit title 5 or 8

Upon completion of the course the student shall be able to learn out

ENGINEERING CHEMISTRY AND ENVIRONMENTAL STUDIES

1.0 Atomic structure

- 1.1 Explain the charge, mass of fundamental particles of an atom (electron, proton and neutron) and the concept of atomic number and mass number.
- 1.2 State the Postulates of Bohr's atomic theory and its limitations.
- 1.3 Explain the significance of four Quantum numbers.
- 1.4 Explain 1. Aufbau principle, 2 Pauli's exclusion principle 3 Hund's rule.
- 1.5 Define Orbital of an atom and draw the shapes of s, p and d- Orbitals.
- 1.6 Write the electronic configuration of elements up to atomic number 30
- 1.7 Explain the significance of chemical bonding
- 1.8 Explain the Postulates of Electronic theory of valency
- 1.9 Define and explain Ionic and Covalent bonds with examples of NaCl, MgO, *H₂, *O₂ and *N₂. (* Lewis dot method)
- 1.10 List out the Properties of Ionic compounds and covalent compounds and distinguish between their properties.
- 1.11 Structures of ionic solids-define a) Unit cell b) co-ordination number and the structures of NaCl and CsCl unit cells.

2.0 Solutions

- 2.1 Define the terms 1. Solution, 2. Solute and 3. Solvent
- 2.2 Classify solutions based on physical state and solubility
- 2.3 Define mole and problems on mole concept.
- 2.4 Define the terms 1. Atomic weight, 2. Molecular weight and 3. Equivalent weight and calculate Molecular weight and Equivalent weight of the given acids. (HCl, H₂SO₄, H₃PO₄) Bases (NaOH, Ca(OH)₂, Al(OH)₃) and Salts (NaCl, Na₂CO₃, CaCO₃)
- 2.5 Define molarity and normality and numerical problems on molarity and normality
 - a) Calculate the Molarity or Normality if weight of solute and volume of solution are given
 - b) Calculate the weight of solute if Molarity or normality with volume of solution are given
 - c) Problems on dilution to convert high concentrated solutions to low concentrated Solutions

3.0 Acids and bases

- 3.1 Explain Arrhenius theory of Acids and Bases and give the limitations of Arrhenius theory of Acids and Bases.
- 3.2 Explain Bronsted-Lowry theory of acids and bases and give the limitations of Bronsted-Lowry theory of acids and bases.
- 3.3 Explain Lewis theory of acids and bases and give the limitations of Lewis theory of acids and bases.
- 3.4 Explain the Ionic product of water
- 3.5 Define pH and explain P^H scale and solve the Numerical problems on pH (Strong Acids and Bases)
- 3.6 Define and explain buffer solution and give the examples of buffer solutions.
- 3.7 State the application of buffer solutions

4.0 Principles of Metallurgy

- 4.1 List out the Characteristics of Metals and non-metals
- 4.2 Distinguish between Metals and Non-metals

- 4.3 Define the terms 1. Mineral, 2. Ore, 3. Gangue, 4. Flux 5. Slag
- 4.4 Describe the methods of concentration of Ore; 1. Handpicking, 2. Levigation and 3. Froth Floatation
- 4.5 Describe the methods involved in extraction of crude metal- Roasting, Calcination and Smelting.
- 4.6 Explain the purification of Copper by Electrolytic Refining
- 4.7 Define an Alloy and Write the composition and uses of the following alloys. 1. Brass 2. German silver 3. Nichrome.

5.0 Electrochemistry

- 5.1 Define the terms 1. Conductor 2. Semiconductor 3. Insulator, 4. Electrolyte 5. Non-electrolyte. Give two examples each.
- 5.2 Distinguish between metallic conduction and Electrolytic conduction
- 5.3 Explain electrolysis by taking example fused NaCl
- 5.4 Explain Faraday's laws of electrolysis
- 5.5 Define 1. Chemical equivalent (E) 2. Electrochemical equivalent (e) and their relation.
- 5.6 Solve the Numerical problems on Faraday's laws of electrolysis and applications of electrolysis (Electro plating)
- 5.7 Define Galvanic cell and explain the construction and working of Galvanic cell.
- 5.8 Distinguish between electrolytic cell and galvanic cell
- 5.9 Explain the electrode potentials and standard electrode potentials
- 5.10 Explain the electrochemical series and its significance
- 5.11 Explain the emf of a cell and solve the numerical problems on emf of the cell based on standard electrode potentials.

6.0 Corrosion

- 6.1 Define the term corrosion.
- 6.2 state the Factors influencing the rate of corrosion
- 6.3 Describe the formation of a) composition cell b) stress cell c) concentration cell during corrosion.
- 6.4 Define rusting of iron and explain the mechanism of rusting of iron.
- 6.5 Explain the methods of prevention of corrosion
 - a) Protective coatings (anodic and cathodic coatings)
 - b) Cathodic protection (Sacrificial anode process and Impressed-voltage process)

7.0 Water Treatment

- 7.1 Define soft water and hard water with respect to soap action.
- 7.2 Define and classify the hardness of water.
- 7.3 List out the salts that causing hardness of water (with Formulae)
- 7.4 State the disadvantages of using hard water in industries.
- 7.5 Define Degree of hardness and units of hardness (mg/L) or (ppm).
- 7.6 Explain the methods of softening of hard water: a) Ion-exchange process, b) Permutit process or zeolite process
- 7.7 State the essential qualities of drinking water.
- 7.8 Chemistry involved in treatment of water (Coagulation, Chlorination, defluoridation)
- 7.9 Explain Osmosis and Reverse Osmosis with examples.
- 7.10 State the applications of Reverse Osmosis.

8.0 Polymers

- 8.1 Explain the concept of polymerisation
- 8.2 Describe the methods of polymerization a) addition polymerization of ethylene b) condensation polymerization of Bakelite (Only flow chart)
- 8.3 Define thermoplastics and thermosetting plastics with examples.
- 8.4 Distinguish between thermo plastics and thermosetting plastics
- 8.5 List the Characteristics of plastics and state the disadvantages of using plastics.
- 8.6 State the advantages of plastics over traditional materials.
- 8.7 Explain the methods of preparation and uses of the following plastics:
1. PVC, 2. Teflon, 3. Polystyrene 4. Nylon 6,6
- 8.8 Explain processing of Natural rubber and write the structural formula of Natural rubber.
- 8.9 List the Characteristics of raw rubber
- 8.10 Define and explain Vulcanization and List out the Characteristics of Vulcanized rubber.
- 8.11 Define the term Elastomer and describe the preparation and uses of the following synthetic rubbers a) Buna-s and b) Neoprene rubber.

9.0 Fuels

- 9.1 Define the term fuel
- 9.2 Classify the fuels based on physical state and based on occurrence.
- 9.3 List the characteristics of good fuel.
- 9.4 State the composition and uses of gaseous fuels.
a) water gas b) producer gas, c) natural gas, d) Coal gas, e) Biogas.

10.0 Chemistry in daily life

- 10.1 Give the basic chemical composition, applications, health aspects and pollution impacts of
a) soaps, and detergents b) vinegar c) Insect repellents d) activated charcoal e) Soft drinks

11.0 ENVIRONMENTAL STUDIES

- 11.1 Define the term environment and explain the scope and importance of environmental studies
- 11.2 Define the segments of environment 1). Lithosphere, 2). Hydrosphere, 3). Atmosphere, 4). Biosphere,
- 11.3 Define the following terms 1) Pollutant, 2). Pollution, 3). Contaminant, 4) receptor, 5) sink, 6) particulates, 7) dissolved oxygen (DO), 8) Threshold limit value (TLV), 9). BOD, 10). COD 11) eco system 12) Producers 13) Consumers 14) Decomposers with examples
- 11.4 State the renewable and non renewable energy sources with examples.
- 11.5 Explain biodiversity and threats to biodiversity
- 11.6 Define air pollution and classify the air pollutants based on origin and physical state of matter.
- 11.7 Explain the causes, effects of air pollution on human beings, plants and animals and control methods of air pollution.
- 11.8 State the uses of forest resources.
- 11.9 Explain causes and effects of deforestation
- 11.10 Explain the causes and effects of the following
1.) Greenhouse effect, 2) Ozone layer depletion and 3) Acid rain
- 11.11 Define Water pollution, explain the causes, effects and control methods of Water pollution.

COURSE CONTENT

ENGINEERING CHEMISTRY AND ENVIRONMENTAL STUDIES

1. Fundamentals of Chemistry

Atomic Structure: Introduction - Fundamental particles – Bohr's theory – Quantum numbers –Aufbau principle - Hund's rule - Pauli's exclusion Principle- Orbitals, shapes of s, p and d orbitals - Electronic configurations of elements

Chemical Bonding: Introduction – types of chemical bonds – Ionic and covalent bond with examples– Properties of Ionic and Covalent compounds- structures of ionic crystals (NaCl and CsCl).

2. Solutions

Introduction of concentration methods – mole concept, molarity and normality – Numerical problems on mole, molarity and normality.

3. Acids and Bases

Introduction – Theories of acids and bases and limitations – Arrhenius theory- Bronsted –Lowry theory – Lewis acid base theory – Ionic product of water- pH related numerical problems–Buffer solutions, action of buffer and its applications.

4. Principles of Metallurgy

Characteristics of Metals and non-metals –Distinguish between Metals and Non-metals, Define the terms i) Metallurgy ii) ore iii) Gangue iv) flux v) Slag - Concentration of Ore –Hand picking, Levigation, Froth floatation – Methods of Extraction of crude Metal – Roasting, Calcination, Smelting – Alloys – Composition and uses of brass, German silver and nichrome.

5. Electrochemistry

Conductors, semiconductors, insulators, electrolytes and non-electrolytes – electrolysis – Faraday's laws of electrolysis-application of electrolysis(electroplating) -numerical problems on Faraday's laws – Galvanic cell – standard electrode potential – electrochemical series–emf and numerical problems on emf of a cell .

6. Corrosion

Introduction - factors influencing corrosion - composition, stress and concentration cells–rusting of iron and its mechanism – prevention of corrosion by coating methods, cathodic protection methods.

7. Water technology

Introduction–soft and hard water–causes of hardness–types of hardness –disadvantages of hard water – degree of hardness (ppm and mg/lit) – softening methods – permutit process – ion exchange process– qualities of drinking water –Chemistry involved in treatment of water (Coagulation, Chlorination, defluoridation) - Osmosis, Reverse Osmosis –Applications of Reverse osmosis.

8. Polymers

Introduction – polymerization – types of polymerization – addition, condensation with examples – plastics – types of plastics – advantages of plastics over traditional materials-Disadvantages of using plastics – Preparation and uses of the following plastics i).PVC ii) Teflon iii) Polystyrene iv) .Nylonn 6,6 – Processing of natural rubber - Vulcanization – Elastomers- Preparation and applications of Buna-s, Neoprene rubbers.

9.Fuels

Definition and classification of fuels–characteristics of good fuel-composition and uses of gaseous fuels.

10. Chemistry in daily life

Basic composition, applications, health aspects and pollution impacts of soaps and detergents, vinegar, insect repellents, soft drinks, activated charcoal.

11. ENVIRONMENTAL STUDIES

Introduction– environment –scope and importance of environmental studies – important terms related to environment– renewable and non-renewable energy sources–Concept of ecosystem – Biotic components – Forest resources – Deforestation –Biodiversity and its threats–Air pollution – causes-effects–Global environmental issues – control measures – Water pollution – causes – effects – control measures.

REFERENCE BOOKS

1. Telugu Academy Intermediate chemistry Vol 1&2
2. Jain & Jain Engineering Chemistry
3. O.P. Agarwal, Hi- Tech. Engineering Chemistry
4. Sharma Engineering Chemistry
5. A.K. De Engineering Chemistry

Table specifying the scope of syllabus to be covered for unit test 1, unit test 2 and unit test 3

Unit Test	Learning outcomes to be covered
Unit Test - 1	From 1.1 to 3.7
Unit Test - 2	From 4.1 to 7.10
Unit Test - 3	From 8.1 to 11.11

Model question paper for Unit Test with Cos mapped

UNIT TEST –I

Model Question Paper (C-20)

ENGINEERING CHEMISTRY & ENVIRONMENTAL STUDIES (AG-104)

TIME: 90 minutes

Total Marks: 40

PART-A

16 Marks

Instructions: (1) Answer all questions.

(2) First question carries 4 marks and each of rest carries 3 marks.

(3) Answers for Q.No. 2 to 5 should be brief and straight to the point and shall not exceed five simple sentences.

1. a. Number of neutrons in ${}_{11}\text{Na}^{23}$ is -----(CO1)
b. The molarity and normality of HCl is the same (True or False)(CO1)
c. What is the p^{H} range of base? (CO1)
d. Graphite is a good conductor of electricity (Yes or No) (CO1)
2. Distinguish between orbit and orbital.(CO1)
3. Define Covalent bond. Explain the formation of covalent bond in Oxygen and Nitrogen molecules.
(CO1)

4. Define mole. Calculate the number of moles present in 50 gm of CaCO_3 and 9.8 gm of H_2SO_4 . (CO1)
5. Define P^{H} . Calculate the P^{H} of 0.001M HCl and 0.01M NaOH solution. (CO1)

PART – B

3x8M = 24M

Answer either (A) or (B) from each questions from Part-B.

Each question carries 8 marks.

6. A) Explain Postulations of Bhor's atomic theory. Give its limitations. (CO1)
(OR)
B) Explain the significance of Quantum numbers. (CO1)
7. A) Express molarity normality with mathematical equation. Calculate the molarity and normality of 10gm of NaOH present in 500 ml solution. (CO1)
(OR)
B) Classify solutions based the physical state of solute and solvent and give an example each. (CO1)
8. A) What is buffer solution? Classify with examples and give it's applications. (CO1)
(OR)
B) Explain Bronsted-Lowry theory of acids and bases. Give its limitations. (CO1)

UNIT TEST –II

Model Question Paper (C-20)

ENGINEERING CHEMISTRY & ENVIRONMENTAL STUDIES (AG-104)

TIME: 90 minutes

Total Marks:40Marks

PART-A

16 Marks

Instructions: (1) Answer all questions.

(2) First question carries 4 marks and each of rest carries 3 marks.

(3) Answers for Q.No. 2 to 5 should be brief and straight to the point and shall not exceed five simple sentences.

1. a) Bauxite is the ore of metal (CO2)
b) What is the unit of electrochemical equivalent?(CO2)
c) CaSO_4 is the permanent hardness causing salt. (True or False) (CO3)
d) Write the Chemical formula of rust.(CO2)
2. Write any three differences between metallic conduction and electrolytic conduction.(CO2)
3. Write the composition and applications of German silver and Nichrome.(CO1)
4. Mention any three disadvantages of using hard water in industries.(CO3)

5. Define electro chemical equivalent and chemical equivalent. Give the relation between them. **(CO2)**

PART – B

3x8M = 24M

Answer either (A) or (B) from each questions from Part-B.

Each question carries 8 marks.

6. A) What is galvanic cell? Explain construction and working of galvanic cell with neat diagram **(CO2)**

(OR)

B) State and explain Faraday`s laws of electrolysis. **(CO2)**

7. A) Explain different types of galvanic cells formed during the corrosion of metals. **(CO2)**

(OR)

B) What is hard water? Explain zeolite process of softening of hard water. **(CO3)**

8. A) Explain Froth floatation process. **(CO1)**

(OR)

B) Explain Electrolytic refining processing of copper. **(CO1)**

UNIT TEST –III

Model Question Paper (C-20)

ENGINEERING CHEMISTRY & ENVIRONMENTAL STUDIES (AG-104)

TIME: 90 minutes

Total Marks:40

PART-A

16 Marks

Instructions: (1) Answer all questions.

(2) First question carries 4 marks and each of rest carries 3 marks.

(3) Answers for Q. No. 2 to 5 should be brief and straight to the point and shall not exceed five simple sentences.

1. a) The monomer of PVC..... **(CO4)**
b) Sulphur is the vulcanising agent. (True/False) **(CO4)**
c) Give an example for secondary pollutant. **(CO5)**
d) Presence of ozone in stratosphere is a pollutant. (Yes/No) **(CO5)**
2. List any three characteristic properties of vulcanised rubber. **(CO4)**
3. Define primary fuel and secondary fuels give an example each. **(CO4)**

- Mention the basic chemical composition and applications of vinegar. **(CO4)**
- Write any three threats to the biodiversity. **(CO5)**

PART – B

3x8M = 24M

Answer either (A) or (B) from each questions from Part-B.

Each question carries 8 marks.

- A) Explain addition and condensation polymerisation with an example each. **(CO4)**
(OR)
B) Give a method of preparation and applications of the following
i) Buna-S ii) Neoprene **(CO4)**
- A) What is air pollution? Explain any three causes of air pollution. **(CO5)**
(OR)
B) Briefly explain ozone layer depletion and green houseeffect. **(CO5)**
- A) What is water pollution? Explain any three controlling methods of water pollution. **(CO5)**
(OR)
B) What are thermoplastics and thermo setting plastic? Write any four differences between these two plastics. **(CO4)**

Model Question Paper (C-20)

ENGINEERING CHEMISTRY & ENVIRONMENTAL STUDIES (AG-104)

TIME: 3hrs

Total Marks:80

PART-A

Instructions: (1) Answer all questions.

(2) Each question carries 3 marks.

Answer all questions. Each question carries three marks.

3x10=30M

- Draw the shapes of s and p orbitals. **(CO1)**
- Define mole. Find the mole number of 10 g of CaCO_3 **(CO1)**
- Define Buffer solution. Give any two examples. **(CO1)**
- Define chemical equivalent and electrochemical equivalent. Give their relation. **(CO2)**
- State name of the salts and their formulae that cause hardness. **(CO3)**
- Write any three disadvantages of using plastics. **(CO4)**
- Classify the fuels based on their occurrence. **(CO4)**
- Mention the basic chemical composition and applications of vinegar. **(CO4)**

9. List out any three threats to biodiversity. (CO5)
10. Define pollutant and contaminant. Give an example each. (CO5)

PART – B

Each question carries eight marks.

8x5=40M

11. A) Explain Bohr's atomic theory and give its limitations. (CO1)
(OR)
B) Explain ionic bond formation and covalent bond formation with one example each (CO1)
12. A) Calculate the molarity and normality of 250 ml of sodium carbonate solution that contains 10.6 gm of sodium carbonate. (CO1)
(OR)
B) Explain Bronstead and Lowry theory of acids and bases. Give its limitations. (CO1)
13. A) Explain froth floatation and electrolytic refining of copper with neat diagrams. (CO1)
(OR)
B) Explain the construction and working of galvanic cell. (CO2)
14. A) Explain Cathode protection methods. (CO2)
(OR)
B) Explain ion-exchange of softening of hard water with a neat diagram. (CO3)
15. A) Explain addition and condensation polymerization with an example each. (CO4)
(OR)
B) Explain the causes and effects of air pollution. (CO5)

PART – C

Question carries ten marks

10x1 =10M

16. Analyse the products formed at cathode and anode with electrode reactions during the Electrolysis of aqueous NaCl in compare with fused NaCl. (CO2)

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-105	Basics Of Computers with Animation and Graphics	3	90	20	80

S.No.	Chapter/Unit Title	No.of Periods	CO's Mapped
1.	Fundamentals of Computers	15	CO1,CO3,CO4
2.	Programming Methodology	10	CO2
3.	Operating System basics	20	CO1,CO3
4.	Computer Hardware and Networking Basics	25	CO1,CO4,CO5
5.	Basics of Multimedia and Animation	20	CO2,CO6,C07
Total Periods		90	

Course Objectives
i)To know the fundamentals of Computers ii)To familiarize programming methodologies like algorithms and flowcharts iii)To understand Operating system basics iv)To familiarize basics of animation and multimedia

Course Outcomes	At the end of the course the student able to learn following:		
	CO1	AG-105.1	Explain computer fundamentals
	CO2	AG-105.2	Explain various flowchart, algorithm methods
	CO3	AG-105.3	Explain the importance of Basic Computer operating systems
	CO4	AG-105.4	Analyse functioning of various Hardware components
	CO5	AG-105.5	Explain Networking process in computers
	CO6	AG-105.6	Explain basics of Computer Graphics and Animation concepts with examples.

CO-PO/PSO Matrix:

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
AG-105.1	3							3	1	1
AG-105.2	1	2	2	1		3		1	3	1
AG-105.3	3	1		1		1	1	3	1	1
AG-105.4	3		2	2	1		1	2	1	2
AG-105.5	3		2		1	1	1	2	1	2
AG-105.6	3			1	2		2	2	2	1
Average	2.7	1.5	2	1.25	1.3	1.7	1.25	2.2	1.3	1.3

3=Strongly mapped , 2=moderately mapped, 1=slightly mapped

Learning Outcomes:

1.0 Fundamentals of Digital Computer

- 1.1. Define various terms related to computers – Computer, Hardware , Software, Firmware, High Level Language , Low Level Language
- 1.2. Draw and explain block diagram of a Computer in detail
- 1.3. Describe the current family of CPUs used in Computers.
- 1.4. State the use of storage devices used in a Computer.
- 1.5. List the two types of memory used in a Computer.
- 1.6. State the importance of cache memory.
- 1.7. Explain the generations of computers.
- 1.8. Classification of computers - based on a) size, b) processor.
- 1.9. State the importance of binary number system for use in Digital Computers

2.0 Implement Programming Methodology.

- 2.1. State the different steps involved in problem solving.
- 2.2. Define algorithm.
- 2.3. List four characteristics of algorithm.
- 2.4. Define a program
- 2.5. Differentiate between program and algorithm.
- 2.6. State the steps involved in algorithm development.
- 2.7. Differentiate between algorithm and flowchart.
- 2.8. Develop algorithms for simple problems.
- 2.9. Draw the symbols used in flowcharts.
- 2.10. Draw flowcharts for simple problems.

3.0 Operating Systems basics

- 3.1. Describe the need for an operating system.
- 3.2. List the various operating systems used presently.
- 3.3. List and explain
 - 3.3.1.Types of dos commands
 - 3.3.2.Any 10 Internal Commands
 - 3.3.3.Any 5 External Commands
 - 3.3.4.Features of Windows desktop.
 - 3.3.5.Components of a Window.
- 3.4. State the function of each component of a Window.
- 3.5. Describe the Method of starting a program using start button
- 3.6. Explain usage of maximize, minimize, restore down and close buttons.
- 3.7. State the meaning of a file ,folder.
- 3.8. Describe the Method of viewing the contents of hard disk drive using Explorer
- 3.9. Describe the Method of finding a file using search option.
- 3.10. Use control panel for
 - 3.10.1. installing and uninstalling software
 - 3.10.2. installing and uninstalling hardware
 - 3.10.3. Changing the system date and time
 - 3.10.4. Installing a printer
- 3.11. Explain Drive space using system tool option of Accessories group
- 3.12. Explain Disk defragmentation using System tools
- 3.13. Explain the procedure for changing resolution, color, appearance, screensaver options of the display

4.0 Computer Hardware and Networking Basics

4.1 Hardware Basics

- 4.1.1 Identify hardware used for I/P, O/P & inside computer case, system board components used for communication among devices
- 4.1.2 Software - 3 types of Software:ROM BIOS, OS, application software
- 4.1.3 Explain Functions of BIOS
- 4.1.4 Explain boot process
- 4.1.5 Explain POST and important beep codes
- 4.1.6 Describe about different connectors.

4.2 Networking Basics

- 4.1.1.Explain meaning of a computer network.
- 4.1.2.Describe the concept of a Local Area Network,Wide Area Network
- 4.1.3.Compare Internet and Intranet
- 4.1.4.Describe about internet service provider.
- 4.1.5.Explain the role of a modem in accessing the Internet.
- 4.1.6.Describe address format and IP address
- 4.1.7.What is browser and List various browsers
- 4.1.8.Explain the role of search engines with examples.
- 4.1.9.Explain Internet Security.

5.0 Basics of Graphics , Multimedia and Animation

5.1. Computer Graphics and Multimedia.

- 5.1.1. What is Multimedia?
- 5.1.2. List the components of Multimedia.
- 5.1.4. State the Need of Computer Graphics.
- 5.1.5. Know the meaning of the Graphics and Multimedia terms – pixel, resolution, 2D, 3D, View, Animation, Coordinates, Modelling, texturing, rigging, rendering, compositing, editing. 3D dynamics.
- 5.1.6. Define Transformation and list 3 basic types of transformations.
- 5.1.7. Define Translation, rotation and scaling.
- 5.1.8. List various Computer Graphics Software tools and state their features.
- 5.1.9. List various applications of Computer Graphics.

5.2. Animation

- 5.2.1. Define animation
- 5.2.2. Define Computer animation.
- 5.2.3. Discuss about History of animation.
- 5.2.4. List and explain types of animations.
- 5.2.5. List and explain various terminologies used in animation.
- 5.2.6. **List and explain various Animation Techniques/Methods.**
- 5.2.7. List and explain principles of animation with examples.
- 5.2.8. List various software used for Computer animation
- 5.2.9. State the minimum hardware specifications required for computer animation.
- 5.2.10. List basic tools required for computer animation.
- 5.2.11. Explain applications of Computer Animation.
- 5.2.12. Explain the Animation process and illustrate with an example like creation of animated video etc.

COURSE CONTENT

1.0 Fundamentals of Digital Computer

Block diagram of a digital computer, functional parameters of CPU, Clock speed and word length, Functional blocks of a CPU: ALU and Control unit, types of memory RAM, ROM, purpose of cache memory

2.0 Programming Methodology.

Steps involved in problem solving - Define algorithm , Program - Characteristics of algorithm - Differentiate between program and algorithm- Steps involved in algorithm development - Differentiate algorithm and flowchart - Algorithms for simple problems - Symbols used in flowcharts -Flowcharts for simple problems.

3.0 Understand Operating Systems

Need for an operating system - List the various operating systems - Types of commands, Internal & External Commands Features of Windows desktop - Components of a Window - Function of each component of a Window - Method of starting a program using start button -Maximize, minimize, restore down and close buttons- Meaning of a file and folder -Viewing the contents of hard disk drive using explorer -Finding a file - Formatting a floppy disk using explore option - Installing and uninstalling new software using control panel - installing and un installing a new hardware using control panel - Drive space - disk defragmentation - Installing a printer - Changing resolution, colour, appearance and screensaver options of the display - Changing the system date and time

4.0 Computer Hardware and Networking Basics

Hardware Basics- I/P, O/P - inside computer case- system board components - 3 types of Software - BIOS- boot process - POST - different connectors. Networking Basics - computer network - Local Area Network - Wide Area Network - Compare Internet and Intranet - internet service provider - role of a modem - address format and IP address - browser - search engines with examples -Describe Internet Security.

5.0 Basics of Multimedia and Animation.

Multimedia- Definition - Components of Multimedia, History of Multimedia- Hypermedia, Overview of Multimedia software, Hardware tools-Applications of Multimedia-Multimedia Products.

Animation- Definition, Computer Animation, History of animation, Types of animations, Animation terminology, Principles of animation, Software available for computer animation, Hardware requirements for Computer animation, Basic Tools for Computer animation, applications of computer animations, illustrate the process of creating animated video.

REFERENCE BOOKS

1. Information Technology - Curtin.
2. Computer Science Theory & Application - E. Balaguruswamy, B. Sushila
3. Introduction to Computers (Special Indian Edition) - Peter Norton
4. Fundamentals of Multimedia.-Ze – Nian li and Mark S Drew, Pearson Education,2004
5. Multimedia Basics. - Morse, Thomson Course Technology.

Model Blue Print:

S.No	Chapter/Unit title	No.of periods	Weightage Allocated	Marks Wise Distribution of Weightage				Question wise Distribution of Weightage				CO's Mapped
				R	U	A p	A n	R	U	A p	A n	
1	Fundamentals of Digital Computers	15	14	3	11			1	2			CO1,CO3,CO4
2	Programming Methodologies	10	14	3	3	8	10	1	1	1	*	CO2
3	Operating system basics	20	14	3	3	8		1	1	1		CO1,CO3
4	Computer Hardware and Networking Basics	25	14	3	11		10	1	2		*	CO1,CO4,CO5
5	Basics Of Computers with Animation and Multimedia Concepts	20	14	6	8			2	1		*	CO2,CO6.CO7
	Total	90	70 + 10(*)					6	7	2		

Note: Part-C: 10 marks single analytical question may be chosen from any or combination of starred chapters

Table specifying the scope of syllabus to be covered for unit tests

Unit Test	Learning outcomes to be covered
Unit test-1	From 1.1 to 3.3
Unit test-2	From 3.4 to 4.1
Unit test-3	From 4.2 to 5.11

DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
MODEL PAPER
BASICS OF COMPUTERS WITH ANIMATION AND GRAPHICS CONCEPTS
UNIT TEST-1
SCHEME: C-20SUBJ CODE:AG-105

MAX MARKS:40

TIME: 90Minutes

PART-A

16Marks

Instructions: 1) Answer all questions
2) First question carries 4marks, and each question of remaining carries 3marks.

- 1.a)All computer physical components are treated as software(True/False) (CO1)
b) -----is the fastest memory in the computer (CO2)
c)Step by step procedure to solve problem is ----- (CO2)
d)Which one of the following is not an internal command [] (CO3)
i)FORMAT II)RD III)COPY IV)CLS
- 2) State the importance of binary number system for use in Digital Computers (CO1)
3)List different steps involved in problem solving (CO2)
4) What is the need for an operating system? (CO3)
5)Write about analog computers. (CO1)

PART-B

3X8=24Marks

Instructions:1) Answer all questions
2) Each question carries 8 Marks
3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

6. a)Draw and explain block diagram of computer in detail (CO1)
Or
b)Explain various generation of computers (CO1)
7. a) Draw the flow chart to find biggest of three numbers (CO2)
Or
b) Write an algorithm to find the area of triangle when base and height are given.(CO2)
8. a) Explain any three external commands in detail (CO3)
Or
b) Explain components of a window. (CO3)

BOARD DIPLOMA EXAMINATIONS
DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
MODEL PAPER – YEAR END EXAMINATION
BASICS OF COMPUTERS WITH ANIMATION AND GRAPHICS CONCEPTS
SCHEME: C-20SUBJ CODE:AG-105

MAX MARKS:80

TIME: 3HOURS

PART-A

10X3=30Marks

Note: Answer all questions

1. Define terms Hardware and Software. (CO1)
2. State the importance of binary system usage in Digital Computers (CO1)
3. Define algorithm (CO2)
4. State the different steps involved in problem solving (CO2)
5. List the features of Windows desktop (CO3)
- 6 . State the meaning of a file and folder (CO3)
7. What is intranet? (CO5)
8. List various browsers (CO5)
9. Define Multimedia and list any two multimedia components (CO6)
10. List any three animation software (CO6)

PART-B

5x8=40Marks

Note: Answer all questions

11. A.Explain the generations of computers? (CO1)

OR

11.B i) State the use of storage devices used in a Computer. (CO1)

ii) State the importance of cache memory. (CO1)

12.A.Differentiate algorithm and flowchart with suitable examples? (CO2)

OR

12.B. Explain in detail the characteristics of an algorithm. (CO2)

13.A.Explain about atleast 10 Internal Commands and 5 External Commands. (CO3)

OR

13.B. Explain the procedure for changing resolution, color, appearance, screensaver options of the display. (CO3)

14.A.Explain 3 types of Software in detail. (CO4)

OR

14.B. Explain Internet Security. (CO5)

15.A.Explain any four types of Animations. (CO6)

OR

15.B.Explain any four Graphic multimedia products. (CO6)

PART-C

1X10=10Marks

16. Write an Algorithm to find the area of triangle if and only if a triangle is formed with the given three sides. (CO2)

FUNDAMENTALS OF ART AND DRAWING

Subject Title	Subject Code	Periods/Week	Periods Per Year
Fundamentals of Art and Drawing	AG-107	06	180

TIME SCHEDULE

S.No	Major Topics	No. Of Periods	Marks to be awarded	Short Answer Questions	Essay type Questions
1	Importance of Art and Drawing	06	-	-	-
2	Art and Drawing Instruments And Study of Colors	18	-	-	-
3	Basic Elements And Principles In Picture Composition	30	15	1	1
4	Perspective Drawing	27	15	1	1
5	Human Anatomy	27	15	1	1
6	Animal Anatomy	27	15	1	1
7	Cartoon Characters	21	10		1
8	Classical Animated Cartoons	24	10		1
Total		180	80	04	06

Course Objectives and Course Outcomes:

Course Objectives		Upon completion of the course the student shall able to understand the basic Art and Drawing skills and use them in preparation of Animation drawings, their reading and interpretation.	
Course Outcomes	CO1	AG-107.1	Practice the use of Art and Drawing instruments, materials and tools
	CO2	AG-107.2	Familiarise with the usage of various surfaces, paints, brushes, inks, notations, colors of Art and Drawing.
	CO3	AG -107.3	Construct the i) basic elements and geometrical shapes and forms ii) Compositional techniques
	CO4	AG -107.4	Visualise and draw the Perspective
	CO5	AG -107.5	Visualise and draw the Human and Animal Anatomy
	CO6	AG -107.6	Draw the development of cartoon characters and Cartoon animations

PO-CO Mapping

Course Code :AG-107	Course Title: ENGINEERING DRAWING				No. of Periods: 180
	Number of Course Outcomes: 06				
POs	Mapped with CO No.	CO Periods addressing PO in Column 1		Level (1,2,3)	Remarks
		No	%		
PO1	CO2, CO3, CO4, CO5, CO6	50	42	3	>40% Level 3 Highly addressed 25% to 40% Level 2 Moderately Addressed 5 to 25% Level 1 Low addressed <5% Not addressed
PO2	CO1, CO2, CO3, CO4, CO5, CO6	30	25	2	
PO3	CO1, CO2, CO3, CO4, CO5, CO6	30	25	2	
PO4					
PO5					
PO6					
PO7	CO1, CO2, CO3, CO4, CO5, CO6	10	08	1	

AG-107	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
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CO1	3	2	2	2				2	2	1
CO2	3	2	2	2				2	2	2
CO3	3	2	2				1	2	3	1
CO4	3	2	2				1	2	3	1
CO5	3	2	2				1	2	3	1
CO6	3	2	2				1	2	3	1
Average	3	2	2				1	2	2.6	1

3: High, 2: Moderate,1: Low

LEARNING OUTCOMES

Upon completion of the course the student shall able to

1. Importance of Art and Drawing

- 1.1. Know the Brief History Of Art and Drawing.
- 1.2. Know the importance of Caveman Classical art.
- 1.3. Know the importance of Renaissance Art.
- 1.4. Know the importance of Modern Art.
- 1.5. Understand linkage between Caveman Classical art, Renaissance art and Modern Art with Animation.

2. Art and Drawing Instruments :

- 2.1. Know various types of Dry Media materials and tools with examples.
- 2.2. Know Why and when to choose Dry Media materials and tools.
- 2.3. Know various types of Wet Media materials and tools with examples.
- 2.4. Know Why and when to choose Wet Media materials and tools.
- 2.5. Know the significance of Markers and Brushes.
- 2.6. Understand different types of Markers and Brushes.
- 2.7. Know the importance of Different Inks and their usage.
- 2.8. Know the importance of Different Paints and their usage.
- 2.9. Know different types of Drawing Paper Surfaces.
- 2.10. Know How to handle Different Drawing Paper Surfaces.
- 2.11. Know Non-paper Drawing Surfaces like Scrachboards.
- 2.12. List the tools for erasing and Sharpening like palettes, knives and Easels.
- 2.13. Study about color wheel.
- 2.14. Know about ColorHormony.
- 2.15. Write about color theory principles.

- 2.16. Know about Primary and Secondary Colors.
- 2.17. Know about Complementary Colors.
- 2.18. Know about Warm or Cool colors.
- 2.19. Know the value of Colors.
- 2.20. Know the Usage of various brushes.
- 2.21. Know the usage of Various Colors of Light and Shade.
- 2.22. Understand and Practice the Process of Painting.

3. Basic Elements And Principles In Picture Composition:

- 3.1. Practice Drawing Lines with different sizes, colors, brushes and paints.
- 3.2. Practice Drawing Circles with different sizes, colors, brushes and paints.
- 3.3. Practice Drawing Ovals with different sizes, colors, brushes and paints.
- 3.4. Practice Drawing Scribbles with different sizes, colors, brushes and paints.
- 3.5. Practice Drawing Patterns with different sizes, colors, brushes and paints.
- 3.6. Practice various drawings observing the surroundings like window, fan, chair etc..
- 3.7. Draw Doodling and Noodling Images or Pictures.
- 3.8. Practice drawing Straight lines.
- 3.9. Practice Freehand drawing to surrounding images near you.
- 3.10. Practice Holding the pencil .
- 3.11. Draw lines with different angles.
- 3.12. Practice drawing various shapes like rectangle, square, polygon, etc.. in different forms.
- 3.13. Practice Drawing with Grids.
- 3.14. Study of light and shade in pencil of still life object
- 3.15. Study and Understand Rule of Thirds, Rule of Odds and Rule of Space and Simplification Compositional Techniques.
- 3.16. Drawing still life objects in outline by pen and pencil by applying Compositional Techniques.
- 3.17. Draw still life objects in pen and ink to trace the light and shade by applying Compositional Techniques.
- 3.18. Construct a scene for a background of animation/film/graphic novel etc and preparing a sketch according to a conception with suitable Compositional Techniques.

3.19. Drawing in details different objects and attributes of the scene in pencil and with light and shade and with suitable Compositional Techniques

3.20. Creating a panorama view of a composition in details with perspectives and proper light and shade , texture, contrast and with suitable Compositional Techniques

4. Perspective Drawing :

4.1. Practice one point perspective drawings.

4.2. Practice two point perspective drawings.

4.3. Learn and Practice three point perspective drawings.

4.4. Practice Multi Point Perspective Drawings.

4.5. Practice drawing with overlapping and intersection of Objects and Shapes in one point Perspective

4.6. Practice drawing with overlapping and intersection of Objects and Shapes in two point Perspective

4.7. Practice drawing with overlapping and intersection of Objects and Shapes in three point Perspective

4.8. Practice drawing with overlapping and intersection of Objects and Shapes in Multi point Perspective

4.9. Drawing outdoor scenes showing one point perspective

4.10. Drawing outdoor scenes showing two point perspective

4.11. Drawing outdoor scenes showing three point perspective

4.12. Drawing indoor/architectural scenes showing one point perspective

4.13. Drawing indoor/architectural scenes showing two point perspective

4.14. Drawing indoor/architectural scenes showing three point perspective

4.15. Drawing a complete scene as a background for an animation/film scene/graphic novel etc. having different perspective views and light and shade

4.16. Drawing any object in 3d style of drawing by following the light and shade

4.17. Drawing any object in 3d style of drawing by following the geometric planes.

5. Human Anatomy:

5.1. Understand the basic proportions of Human anatomy like age, gender, Skeletal, Muscle systems, Body structure, face , eyes, ears , nose, hair , etc..

5.2. Drawing the male figure with proper proportion (like baby, teen, adult)

5.3. Drawing the female figure with proper proportion (like baby, teen, adult)

5.4. Drawing the male face with proper proportion (like baby, teen, adult)

- 5.5. Drawing the female face with proper proportion (like baby, teen, adult)
- 5.6. Drawing the hands and legs with proper proportion (like baby, teen, adult)
- 5.7. Drawing male figure with clothes understanding the folds in basic postures
- 5.8. Drawing female figure with clothes understanding the folds in basic postures
- 5.9. Drawing the human figure as stick figure in different postures and gestures
- 5.10. Tracing the movement of the stick figure from sports and fashion magazine postures
- 5.11. Drawing the stick figure tracing the movements from life study in outdoor.

6. Animal Anatomy.

- 6.1. Understand the animal anatomy like body structure, parts, Motion, Grace, Legs, Tails of different animals, Birds, Reptiles, Insects etc..
- 6.2. Drawing simple animal figures (dogs, cat, horse, elephants etc) in proper proportion
- 6.3. Drawing simple Birds figures (Parrots, Peacock, Swan, Duck, Eagle, Hen, Cock etc) in proper proportion
- 6.4. Drawing simple Reptiles figures (Snakes, Frogs, Crocodile, Tortoise, Squirrel etc..) Eagle, Hen etc) in proper proportion
- 6.5. Drawing simple Insects figures (Butterfly, Bees, Scorpion , Grasshopper etc) in proper proportion
- 6.6. Draw parts of Animals like legs, teeth, face, tails, Horns with proper proportions.
- 6.7. Draw parts of Birds like Wings of Peacock, Swan Neck and Head and Face of Cock, eggs, teeth, face, tails, Horns with proper proportions.
- 6.8. Draw parts of Reptiles like head, Half body, Tail etc with proper proportions.

7. Cartoon Characters:

- 7.1. Study of different types of cartoon character
- 7.2. Practice Constructing Basic Cartoons .
- 7.3. Practice Character Development from cartoons.
- 7.4. Practice developing cartoons from basic shapes. (From Ellipse, Cross, Parallelogram, Heptagon, Octagon, Heart, Arrow, Polygon etc..As shown below)



7.5. Practice Distortions of Proportions (Widening, lengthening, Shrinking, bending various parts of a body like Faces, Eyes, Mouths, Hairs, Nose, Hands, Feet - Facial Expressions)

8. Classic Animated Cartoons

- 8.1. Discuss various types of characters.
- 8.2. Creating cartoon character in reference to existing cartoon character and changing them to create characters of own's idea.
- 8.3. Creating a group of character for a given story or sequence
- 8.4. Create different types of Animated cartoons characters like Cute,Screwball, Goffy etc.
- 8.5. Create different types of Animated Human cartoons characters for a given story or a sequence.
- 8.6. Create different types of Animated Animal cartoons characters for a given story or sequence
- 8.7. Create different types of Animated Birds cartoons characters for a given story or sequence
- .
- 8.8. Create different types of Animated Reptile cartoons characters for a given story or sequence
- .
- 8.9. Create different types of animated cartoons consisting of Elves.
- .
- 8.10. Create different types of animated cartoons consisting Fairy tale characters (Gnomes. Elves, Dwarfs, Witches)

COURSE CONTENTS:

Note: Appropriate Drawing Surfaces are to be chosen based on the topic with appropriate Tools, materials, paints, brushes, ink etc.

1.Importance of Art and Drawing :A Brief History Of Art and Drawing: – importance of Cavemen, Classical Art, Renaissance, Modern Art Etc.

2.Art and Drawing Instruments : Drawing Materials And Tools - Dry Media – (Pencils, Charcoals, Chalks, Crayons – Pastels, Erasers, Smudging Tools) - Wet Media – (Dip Pens, Disposable And Cartridge Pens) – Markers – Brushes – Inks (Water Based, Alcohol Based, Indian/Chinese Ink) – Paints (Water Based, Acrylic, Oil)

Drawing Surfaces – (Papers – Newsprint – Vellum - Bristol Board - Rag/Cotton Paper - Watercolor Paper - Charcoal Paper - Colored Paper - Rice Paper – How To Handle These Papers) - Other Drawing Surfaces – (Scratchboards) - Tools For Erasing And Sharpening – Palettes – Knives- Easels .

Study of Colors: The Color Wheel – Primary Colors – Secondary colors- Complementary colors-Warm or cool colors – Value of Colors- Usages of Brushes, Colors of light and shade – process of painting.

3. Basic Elements And Principles In Picture Composition: Drawing Lines, Circles, Ovals, Scribbles, Patterns Etc. - Drawing From Observation, Doodling And Noodling – Drawing Straight Lines –Free Hand Drawing – Holding The Pencil – Angle And Direction Of Lines - Shapes And Forms – Drawing With Grids - Compositional Techniques - Rule Of Thirds - Rule Of Odds - Rule Of Space –Simplification.

4. Perspective Drawing : Vanishing Points – Orthogonal Lines – Horizon –Eye Level – One Point Perspective – Two Point Perspective - Three Point Perspective – Multi- Point Perspective - Overlapping And Intersection Of Shapes In One Point, Two Point And Three Point Perspective Views - Objects And Shapes In Perspective With Light And Shade –Foreshortening — Basic 3D dimensional light set up- 3d shades – 3D planes

5.Human Anatomy: Anatomy Of Different Age Groups – Babies, Children, Teens, Young Adults, Aged - Basic Proportions – Basic Understanding Of The Skeletal And Muscle System – Human Forms In Perspective.

Male And Female Anatomy - Body Structure, Proportion And Construction Of Body Parts, Torso, Face, Eyes, Nose, Ears, Mouth, Hand, Feet , clothes, ornaments Etc.

6. Animal Anatomy: Body Structure, Proportion And Construction Of Body Parts, Basic Forms, Understanding Motion And Grace, Face, Legs, Tails - Use Of Perspectives While Drawing Animals, Birds, Reptiles And Insects.

7. Cartoon Characters: -Understanding Cartoon Characters - Cartoon Constructions – Character Development - Drawing From Basic Shapes - Distortion Of Proportions - Cartoon Faces, Eyes, Mouths, Hairs, Nose, Hands, Feet - Facial Expressions

8. Classic Animated Cartoons: Discuss various types of Characters – Cute – Screwball – Goofy – Heavy, Pugnacious – Humans, Animals, Birds, Reptiles Characters – Fairy Tale Characters – Gnomes – Elves – Dwarfs – Witches

REFERENCE BOOKS

1. Social History Of Art : ArnoldHauser
2. Encyclopaedia Of World Art (Vol.I&II): Mcgraw HillPublication
3. The Art Of Pictorial Composition :Wolehonok
4. Exploring The Elements Of Design : Mark A. Thomas, PoppyEvans
5. The Art Of Composition : MichaelJacobs
6. Complete Books Of Artist Techniques : Dr. KurtHerbers
7. Drawing For The Absolute And Utter Beginner: Claire WatsonGarcia
8. Perspective Made Easy: Ernest RNorling
9. Perspective Drawing Handbook: JosephD'Amelio
10. Layout And Composition For Animation: EdGhertner
11. Animation Background Layout: Mike S Flower
12. Drawing For Animation: PaulWells
13. How To Draw What You See: Rudy DeReyna
14. "Figure study made easy", Aditya Chari, 2nd edition, Grace Prakashan, 2014
15. "Cartooning: the ultimate character design book" Chris Hart, 6th edition, 2014
16. The Fundamentals of Animation. Wells, P. AVA Publishing, 2012

C-20-AG-107

**BOARD DIPLOMA EXAMINATIONS
MODEL QUESTION PAPER
DAGE – I-YEAR
FUNDAMENTALS OF ART AND DRAWING**

Instructions:01. Due weightage will be given for the neatness and usage of proper tools and materials

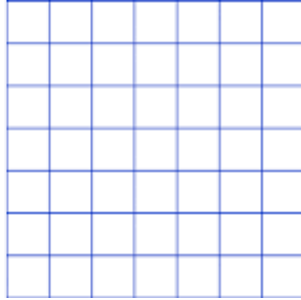
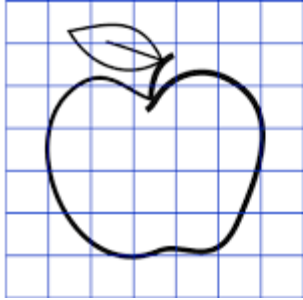
PART – A

05 x 04=20

- 01. Answer all the questions**
- 02. Each question carries FIVE marks**

01. Draw the following image using Grid

CO1



02. Draw an example image with one point perspective view. CO4
03. Draw face and head of a teen girl. CO5
04. Draw the Figure of horse with proper texture , lighting and shading. CO5

PART – B

10 X 04 = 40

- 01. Answer any FOUR of the following questions**
02. Each question carries TEN marks

05. Create a panorama view of a composition of your exam hall in details with perspectives and proper light and shade , texture, contrast and with suitable Compositional Techniques
CO3
06. Draw an image with overlapping and intersection of Objects and Shapes in three point Perspective.
CO3,CO4
07. Draw the human figure as stick figure in different postures and gestures.
CO5
08. Drawing Parrot image while eating ripened Mango at evening 4 o'clock in proper proportion
CO5
09. Draw the Crocodile anatomy from the basic shapes a). Ellipse b). Heart
CO5
10. Assume a man is trying to feed grains to the group of 5 different birds resting on a roof. Construct animated scene in 5 steps showing the birds flying away from the man into the sky with proper background and colors. CO6

REQUIREMENTS OF FUNDAMENTALS OF ART AND DRAWING LAB EQUIPMENTS

SLNO.	EQUIPMENTS
1.	Drawing Stands With Boards
2.	Drawing sheets (A3)
3.	Drawing Mannequin
4.	Drawing Tool Kit(Paints, Inks , Brushes ,Colors,....etc.)

Course Code	Course title	No of periods/week	Total no of periods	Marks for FA	Marks for SA
AG-108	C and Graphics programming Lab	06	180	40	60

S No	Chapter/ Unit Title	No. of Periods	COs Mapped
1.	Fundamentals and Input/Output statements	15	CO1,CO2
2.	Control statements	45	CO1,CO2,CO4
3.	Arrays, structures and unions	60	CO1,CO2,,CO3,CO4
4.	User defined functions, Graphics functions and animation	60	CO1,CO2,CO3,CO4,CO5
	Total	180	

COURSE OBJECTIVES	Upon completion of the course the student shall be able to
	<ol style="list-style-type: none"> 1. Edit, compile and debug execution of C-Programs 2. Learn the syntax of all the statements, keywords, user defied identifiers and usage of writing statements in C-Program. 3. Evaluate all the expressions using different primary types of data, derived data, operators and with their precedence, 4. Write C-programs using I/O statements, decision making statements. 5. Write structured and modular C-programs 6. Write C-programs to make use of graphics functions.. 7. Write C-programs to implement Animations.

CO No	COURSE OUTCOMES
CO 1	AG-108.1 Perform Edit, compile and debug and execution of C-Programs(12)
CO 2	AG-108.2 Develop programs using different predefined functions, keywords, user defined identifiers(18)
CO 3	AG-108.3 Evaluate different expressions using available C-operators and valid data supported by C-language(24)
CO 4	AG-108.4 Develop C-programs using control statements, array's, structures, unions, files (90)
CO 5	AG-108.5 Develop C-programs using user defined Functions and recursion

C06	AG-108.6	Develop C-programs using graphics and animation techniques
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CO-PO/PSO MATRIX

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
AG-108.1	2	2			1			2		
AG-108.2	2	3		2					2	2
AG-108.3					2			2		3
AG-108.4	2		3	2	3	3	2		2	2
AG-108.5	2			2	3	2			2	2
AG-108.6				2	3				2	2
Average	2	2.5	3	2	2.4	2.5	2	2	2	2.2

3=Strongly mapped , 2=moderately mapped, 1=slightly mapped

LEARNING OUTCOMES:

Fundamentals and Input / Output statements

1. Exercise on structure of C Program
2. Exercise on Keywords and identifiers
3. Exercise on constants and variables
4. Execution of simple C program
5. Exercise on operators and expressions
6. Exercise on special operators
7. Exercise on input and output of characters
8. Exercise on formatted input and output
9. Exercise on escape sequence characters

Control statements

(Note: Every statement must be repeated with at least 5 different applications)

10. Exercise on simple if statement
11. Exercise on if..else statement
12. Exercise on if..else..if ladder statement
13. Exercise on switch statement
14. Exercise on conditional operator comparing with if-else statement
15. Exercise on while statement
16. Exercise on for statement
17. Exercise on do. While statement

Arrays, structures and unions

18. Exercise on one dimensional arrays
19. Exercise on two dimensional arrays
20. Exercise on strings
21. Exercise on structure
22. Exercise on union
23. Exercise on array of structures

User defined functions AND Graphics

24. Exercise on user-defined function
25. Exercise on recursion
26. Exercise on lines with different colors and styles
27. Exercise on rectangles
28. Exercise on circles
29. Exercise on ellipses and arcs
30. Exercise on pie chart
31. Exercise on bar chart
32. Exercise on text
33. Exercise on text animation.
34. Exercise on bouncing ball till a key is pressed
35. Exercise on moving car till any key is pressed

The competencies and key competencies to be achieved by the student

S.N o.	Name of the experiment	Objectives	Key Competencies
1	Exercise on structure of C program	For a given C program, identify the different building blocks	❖ Identify different building block in a C program
2	Exercise on Keywords and identifiers	For a given C program identify the keywords and identifiers	❖ Identify different keywords ❖ Check whether the keywords are in lowercase ❖ Differentiate identifiers and keywords
3	Exercise on constants and variables	For a given C program identify the constants and variables	❖ Identify the constants ❖ Identify the variables ❖ Declare variables with proper names ❖ Know the assignment of values to variables
4	Execution of simple C program	Execute a simple C program	❖ Acquaint with C program editing ❖ Compile the program ❖ Rectify the syntactical errors ❖ Execute the program
5	Exercise on operators and expressions	Write a C program that uses different arithmetic operators	❖ Identify different arithmetic operators ❖ Build arithmetic expressions ❖ Identify the priorities of operators ❖ Evaluate arithmetic expression ❖ Compile the program ❖ Rectify the syntactical errors ❖ Execute the program ❖ Check the output for its correctness

6	Exercise on special operators	Write a C program that uses special operators	<ul style="list-style-type: none"> ❖ Identify different special operators ❖ Build expressions using special operators ❖ Compile the program ❖ Rectify the syntactical errors ❖ Execute the program ❖ Check the output for its correctness
7	Exercise on input and output of characters	Write a C program for reading and writing characters	<ul style="list-style-type: none"> ❖ Know the use of get char() function ❖ Know the use of put char() function ❖ Compile the program ❖ Rectify the syntactical errors ❖ Execute the program ❖ Check whether the correct output is printed for the given input
8	Exercise on formatted input and output	Write a C program using formatted input and formatted output	<ul style="list-style-type: none"> ❖ Know the use of format string for different types of data in scan f() function ❖ Know the use of format string for different types of data in print f() function ❖ Check whether the data is read in correct format ❖ Check whether the data is printed in correct format
9	Exercise on Escape Sequence Characters	Write a C program using Escape Sequence Characters	<ul style="list-style-type: none"> ❖ Know the use of Escape sequence characters ❖ Use the Escape sequence characters ❖ Check whether the data is read in correct format ❖ Rectify the syntax errors ❖ Check the output for correctness
10	Exercise on simple if statement	Write a C program using simple if statement	<ul style="list-style-type: none"> ❖ Build a relational expression ❖ Use the if statement for decision making ❖ Rectify the syntax errors ❖ Check the output for correctness
11	Exercise on if.. else statement	Write a C program using if.. else statement	<ul style="list-style-type: none"> ❖ Build a relational expression ❖ Use the if.. else statement for decision making ❖ Rectify the syntax errors ❖ Check the output for correctness
12	Exercise on else..if ladder statement	Write a C program using else..if ladder statement	<ul style="list-style-type: none"> ❖ Use else.. if ladder statements with correct syntax ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check the output for correctness

13	Exercise on switch statement	Write a C program using switch statement	<ul style="list-style-type: none"> ❖ Use switch statement with correct syntax ❖ Identify the differences between switch and else..if ladder ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check the output for correctness
14	Exercise on conditional operator	Write a C program using (? :) conditional operator	<ul style="list-style-type: none"> ❖ Build the three expressions for conditional operator ❖ Use conditional operator with correct syntax ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Differentiate conditional operator and if..else statement
15	Exercise on while statement	Write a C program using while statement	<ul style="list-style-type: none"> ❖ Build the termination condition for looping ❖ Use while statement with correct syntax ❖ Check whether correct number of iterations are performed by the while loop ❖ Rectify the syntax errors ❖ Debug logical errors
16	Exercise on for statement	Write a C program using for statement	<ul style="list-style-type: none"> ❖ Build the initial, increment and termination conditions for looping ❖ Use for statement with correct syntax ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check whether correct number of iterations are performed by the for loop ❖ Differentiate for and while statements
17	Exercise on do..while statement	Write a C program using do statement	<ul style="list-style-type: none"> ❖ Build the termination condition for looping ❖ Use do statement with correct syntax ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check whether correct number of iterations are performed by the while loop ❖ Differentiate do..while, while and for statements
18	Exercise on one dimensional arrays	Write a C program to create and access one dimensional array	<ul style="list-style-type: none"> ❖ Create a one dimensional array with correct syntax ❖ Store elements into array ❖ Read elements from array ❖ Validate boundary conditions while accessing elements of array ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check for the correctness of output for the

			given input
19	Exercise on two dimensional arrays	Write a C program to create and access two dimensional array	<ul style="list-style-type: none"> ❖ Create a two dimensional array with correct syntax ❖ Store elements into array ❖ Read elements from array ❖ Validate boundary conditions while accessing elements of array ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check for the correctness of output for the given input
20	Exercise on strings	Write a C program for reading and writing strings	<ul style="list-style-type: none"> ❖ Declare and initialize string variables ❖ Read strings from keyboard ❖ Print strings to screen
21	Exercise on structure	Write a C program using structure	<ul style="list-style-type: none"> ❖ Define a structure with correct syntax ❖ Identify different members of a structure ❖ Declare a structure variable ❖ Access different members of structure ❖ Observe the size of the structure ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check for the correctness of output for the given input
22	Exercise on union	Write a C program using union	<ul style="list-style-type: none"> ❖ Define a union with correct syntax ❖ Identify different members of a union ❖ Declare a union variable ❖ Access different members of union ❖ Observe the size of the union ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check for the correctness of output for the given input
23	Exercise on array of structures	Write a C program to create an array of structures and store and retrieve data from that array	<ul style="list-style-type: none"> ❖ Define a structure with correct syntax ❖ Identify different members of a structure ❖ Declare a structure variable ❖ Create an array of structure ❖ Access individual element of the array of structure ❖ Access different members of structure ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check for the correctness of output for the given input
24	Exercise on user-	Write a C program to	<ul style="list-style-type: none"> ❖ Identify the different parts of function declaration

	defined function	define and call user-defined functions	<ul style="list-style-type: none"> ❖ Define function with correct syntax ❖ Classify functions based on its parameters and return types ❖ Identify parameters passed ❖ Identify parameter passing method used ❖ Identify return value ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check for the correctness of output for the given input
25	Exercise on recursion	Write a C program using recursion	<ul style="list-style-type: none"> ❖ Identify where recursive call is made in the function ❖ Validate the termination condition ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check for the correctness of output for the given input
26	Exercise on lines	Write a C program to draw different lines with different colors and with different styles.	<ul style="list-style-type: none"> ❖ Know the use of different graphics functions like line(), lineto(), setcolor(), setlinestyle() ❖ Use the different graphics functions and initgraph() ❖ Rectify the syntax errors ❖ Check the output for correctness and effect of various graphic functions.
27	Exercise on rectangles	Write a C program to draw different rectangles with different colors and with different fill styles .	<ul style="list-style-type: none"> ❖ Know the use of different graphics functions like rectangle(), fillpoly(), setcolor(), setfillstyle() ❖ Use the different graphics functions and initgraph() ❖ Rectify the syntax errors ❖ Check the output for correctness and effect of various graphic functions.
28	Exercise on circles	Write a C program to draw concentric circles with different colors and with different fill styles .	<ul style="list-style-type: none"> ❖ Know the use of different graphics functions like circle(), arc(), setcolor(), setfillstyle() ❖ Use the different graphics functions and initgraph() ❖ Rectify the syntax errors ❖ Check the output for correctness and effect of various graphic functions.
29	Exercise on ellipses and arcs	Write a C program to draw different circles and arcs with different colors and with different fill styles .	<ul style="list-style-type: none"> ❖ Know the use of different graphics functions like ellipse(), arc(), setcolor(), setfillstyle() ❖ Use the different graphics functions and initgraph() ❖ Rectify the syntax errors ❖ Check the output for correctness and effect

			of various graphic functions.
30	Exercise on pie chart	Write a C program to draw piechart with different slices with different colors and with different fill styles .	<ul style="list-style-type: none"> ❖ Know the use of different graphics functions like pieslice(), setcolor(), setfillstyle() ❖ Use the different graphics functions and initgraph() ❖ Rectify the syntax errors ❖ Check the output for correctness and effect of various graphic functions.
31	Exercise on bar chart	Write a C program to draw bar and 3d bar charts with different colors and with different fill styles .	<ul style="list-style-type: none"> ❖ Know the use of different graphics functions like bar(), bar3d(), setcolor(), setfillstyle() ❖ Use the different graphics functions and initgraph() ❖ Rectify the syntax errors ❖ Check the output for correctness and effect of various graphic functions.
32	Exercise on text	Write a C program to display different texts with different fonts , styles and colors and sizes .	<ul style="list-style-type: none"> ❖ Know the use of different graphics functions like outtext(), outtextxy(), setcolor(), settextstyle() , textheight(), textwidth() ❖ Use the different graphics functions and initgraph() ❖ Rectify the syntax errors ❖ Check the output for correctness and effect of various graphic functions.
33	Exercise on text Animation	Write a C program to animate Your name on screen	<ul style="list-style-type: none"> ❖ Know the use of different graphics functions like outtext(), outtextxy(), setcolor(), settextstyle() , textheight(), textwidth(), cleardevice(), delay() ❖ Use the different graphics functions and initgraph() ❖ Rectify the syntax errors ❖ Check the output for correctness and effect of various graphic functions.
34	Exercise on Bouncing ball animation	Write a C program to animate bouncing ball till a key on keyboard is pressed	<ul style="list-style-type: none"> ❖ Know the use of different graphics functions like outtext(), outtextxy(), setcolor(), settextstyle() , textheight(), textwidth(), cleardevice(), delay(), kbhit(), circle(), setfillstyle(). ❖ Use the different graphics functions and initgraph() ❖ Rectify the syntax errors ❖ Check the output for correctness and effect of various graphic functions.

35	Exercise on Car Animation	Write a C program to draw a car animate car movement in left to right on the screen till any key on the keyboard is pressed.	<ul style="list-style-type: none">❖ Know the use of different graphics functions like all shape functions(),cleardevice(), delay(), kbhit(), circle(), setfillstyle().❖ Use the different graphics functions and initgraph()❖ Rectify the syntax errors❖ Check the output for correctness and effect of various graphic functions.
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**PHYSICS LAB PRACTICE
(C-20 CURRICULUM COMMON TO ALL BRANCHES)**

SubjectCode	SubjectTitle	Periodsperweek	Totalperiodsperyear
AG-109 A	Physics Laboratory	03	45

TIMESCHEDULE

S.No	Name of the Experiment	No.of Periods
1.	Hands on practice on Vernier Calipers	03
2.	Hands on practice on Screw gauge	03
3.	Verification of Parallelogram law of forces and Triangle law of forces	03
4.	Simple pendulum	03
5.	Velocity of sound in air – (Resonance method)	03
6.	Focal length and Focal power of convex lens (Separate & Combination) (Single	03
7.	Refractive index of solid using traveling microscope	03
8.	Boyle’s law verification	03
9.	Meter bridge	03
10.	Mapping of magnet lines of force and locate null points	03
	DEMONSTRATION EXPERIMENTS	
11.	Surface tension of liquid using traveling microscope	03
12.	Coefficient of viscosity by capillary method	03
	Revision	06
	Test	03
	Total	45

Objectives:

Upon completion of the course the student shall be able to

- 1.0 Practice with Vernier calipers to determine the volumes and areas of a cylinder and sphere and their comparison etc .
- 2.0 Practice with Screw gauge to determine thickness of a glass plate, cross sectional area of a wire and volumes of sphere and also their comparison etc
- 3.0 Verify the parallelogram law and Triangle law
- 4.0 Determine the value of acceleration due to gravity using Simple Pendulum
- 5.0 Determine the velocity of sound in air at room temperature and its value at zero degree centigrade.
- 6.0 Calculate the Focal length and focal power of convex lenses using distant object method , U-V method , U-V graph and $1/U - 1/V$ graph methods and their comparison.
- 7.0 Determine the refractive index of a solid using travelling microscope.
- 8.0 Verify the Boyle’s law employing a Quill tube.
- 9.0 Determine the specific resistance of material of a wire using Meter Bridge.

- 10.0 Drawing magnetic lines of force under N-S and N-N methods and locate null points.
 11.0 Determine the surface tension of a liquid using travelling Microscope (**Demo**)
 12.0 Determine the viscosity of a liquid using capillary method (**Demo**)

Competencies and Key competencies to be achieved by the student

Name of the Experiment	Competencies	Key competencies
1. Hands on practice on Vernier Calipers(03)	<ul style="list-style-type: none"> • Find the Least count • Fix the specimen in posit • Read the scales • Calculate the physical quantities of given object 	<ul style="list-style-type: none"> • Read the scales • Calculate the requisite physical quantities of given objects
2. Hands on practice on Screw gauge(03)	<ul style="list-style-type: none"> • Find the Least count • Fix the specimen in posit • Read the scales • Calculate thickness of glass plate and cross section of wire and other quantities 	<ul style="list-style-type: none"> • Read the scales • Calculate thickness of given glass plate • Calculate cross section of wire and other quantities
3. Verification of Parallelogram law of forces and Triangle law of forces(03)	<ul style="list-style-type: none"> • Fix suitable weights • Note the positions of threads on drawing sheet • Find the angle at equilibrium point • Construct parallelogram • Compare the measured diagonal • Construct triangle • Find the length of sides • Compare the ratios 	<ul style="list-style-type: none"> • Find the angle at equilibrium point • Constructing parallelogram • Construct triangle • Compare the ratios of force and length
4. Simple pendulum(03)	<ul style="list-style-type: none"> • Fix the simple pendulum to the stand • Adjust the length of pendulum • Find the time for number of oscillations • Find the time period • Calculate the acceleration due to gravity • Draw I-T and I-T² graph 	<ul style="list-style-type: none"> • Find the time for number of oscillations • Find the time period • Calculate the acceleration due to gravity • Draw I-T and I-T² graph

<p>5. Velocity of sound in air –Resonance method (03)</p>	<ul style="list-style-type: none"> • Arrange the resonance apparatus • Adjust the reservoir level for booming sound • Find the first and second resonating lengths • Calculate velocity of sound 	<ul style="list-style-type: none"> • Adjust the reservoir level • Find the first and second resonating lengths • Calculate velocity of sound at room temperature • Calculate velocity of sound at 0° C
<p>6. Focal length and Focal power of convex lens (Separate & Combination) (03)</p>	<ul style="list-style-type: none"> • Fix the object distance • Find the Image distance • Calculate the focal length and power of convex lens and combination of convex lenses • Draw u-v and $1/u - 1/v$ graphs 	<ul style="list-style-type: none"> • Calculate the focal length and power of convex lens • Draw u-v and $1/u - 1/v$ graphs
<p>7. Refractive index of solid using traveling microscope(03)</p>	<ul style="list-style-type: none"> • Find the least count of vernier on microscope • Place the graph paper below microscope • Read the scale • Calculate the refractive index of glass slab 	<ul style="list-style-type: none"> • Read the scale • Calculate the refractive index of glass slab
<p>8. Boyle's law verification (03)</p>	<ul style="list-style-type: none"> • Note the atmospheric pressure • Fix the quill tube to retort stand • Find the length of air column • Find the pressure of enclosed air • Find and compare the calculated value $P \times l$ 	<ul style="list-style-type: none"> • Find the length of air column • Find the pressure of enclosed air • Find the value $P \times l$

9. Meter bridge(03)	<ul style="list-style-type: none"> • Make the circuit connections • Find the balancing length • Calculate unknown resistance • Find the radius of wire • Calculate the specific resistance 	<ul style="list-style-type: none"> • Find the balancing length • Calculate unknown resistance • Calculate the specific resistance
10. Mapping of magnet lines of force(03)	<ul style="list-style-type: none"> • Draw magnetic meridian • Placed the bar magnet in NN and NS directions • Draw magnetic lines of force • Locate the neutral points along equatorial and axial lines 	<ul style="list-style-type: none"> • Draw magnetic lines of force • Locate the neutral points along equatorial and axial lines
11. Surface tension of liquid using traveling microscope(03)	<ul style="list-style-type: none"> • Find the least count of vernier on microscope • Focus the microscope to the lower meniscus & bent pin • Read the scale • Calculate height of liquid rise • Calculate the surface tension of water 	<ul style="list-style-type: none"> • Read the scale • Calculate height of liquid rise • Calculate the surface tension of water

Scheme	12.. Coefficient of viscosity by capillary method(03)	<ul style="list-style-type: none"> • Find the least count of vernier • Fix the capillary tube to aspiratory bottle • Find the mass of collected water • Find the pressure head • Calculate rate of volume of liquid collected • Find the radius of capillary tube • Calculate the viscosity of water using capillary method 	<ul style="list-style-type: none"> • Find the pressure head • Calculate rate of volume of liquid collected • Find the radius of capillary tube • Calculate the viscosity of water 	of
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Valuation for end Lab Practical Examination :

- A. Writing Aim, Apparatus, Formula, Graph, Precautions carries 10 (Ten) Marks
 B. For Drawing the table, taking Readings, Calculation work, Drawing the graph, finding result carries 15 (Fifteen) Marks
 C. Viva Voice 05 (Five) Marks

Total 30 (Thirty) Marks

➤ **Course outcomes**

Course Outcomes	CO1	Experiments with Vernier calipers, Screw gauge, Parallelogram law and Triangle law
	CO2	Experiments with Simple pendulum, Resonance apparatus (Velocity of sound in air)
	CO3	Experiments with Convex lens, Refractive index of solid by travelling microscope
	CO4	Experiments with quill tube (Boyles law verification), Meter bridge, Mapping of magnetic lines of force
	CO5	Experiments with Surface tension and Viscosity

➤ **COs-PO mapping strength (as per given table)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3			1	1	1	1
CO2	3	2	2		1		
CO3	3		2			1	2
CO4	3	2			2		
CO5	3		1	2		1	2

3 = strongly mapped 2= moderately mapped 1= slightly mapped

CHEMISTRY LABORATORY
(C-20 curriculum common to all Branches)

SubjectCode	SubjectTitle	Periodsperweek	Totalperiodsperyear
AG-109B	Chemistry Laboratory	03	45

CO1	Operate and practice volumetric apparatus and preparation of standard solution
CO2	Evaluate and judge the neutralization point in acid base titration
CO3	Evaluate the end point of reduction and oxidation reaction
CO4	Judge the stable end point of complex formation, stable precipitation
CO5	Judge operate and demonstrate and perform precise operations with instrument for investigation of water pollution parameters

PO CO mapping

Course code AG-109B	Chemistry Laboratory Cos;5				periods 45
	Mapped with CO No	CO periods addressing PO in Col 1 NO	%	Level 1,2,3	remarks
	CO1,CO2,CO3, CO4,CO5				>40% level 3 (highly addressed) 25% to 40% level2(moderately addressed 5% to 25% level1 (Low addressed < 5%(not addressed)
	CO1,CO2,CO3, CO4,CO5				
	CO1,CO2,CO3, CO4,CO5				
	CO2,CO3, CO4,CO5				

COs-POs mapping strength (as per given table)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	3		1				1		
CO2	2	3		2	2			1		
CO3	2	3		2	2			1		
CO4	2	3		2	2			1		
CO5	2	3		2	2			1		

3=strongly mapped

2= moderately mapped

1= slightly mapped

Note:
 The gaps in CO and PO mapping will be achieved by one or more appropriate activities from the following:
 i) Seminars ii) Tutorials iii) Guest Lectures iv) Assignments v) Quiz competitions vi) Industrial visit vii) Tech Fest viii) Mini project ix) Group discussions x) Virtual classes xi) Library visit for e-books

TIMESCHEDULE

S.No	Name of the Experiment	No.ofPeriods	Mapped with COs
1.	a) Recognition of chemical substances and solutions used in the laboratory by senses. b) Familiarization of methods for Volumetric analysis	03	CO1
2.	Preparation of Std Na_2CO_3 and making solutions of different dilution solution.	03	CO1
3.	Estimation of HCl solution using Std. Na_2CO_3 solution	03	CO2
4.	Estimation of NaOH using Std.HCl solution	03	CO2
5.	Estimation of H_2SO_4 using Std.NaOH solution	03	CO2
6.	Estimation of Mohr's Salt using Std. KMnO_4	03	CO3
7.	Determination of acidity of water sample	03	CO2
8.	Determination of alkalinity of water sample	03	CO2
9.	Determination of total hardness of water using Std. EDTA solution	03	CO4
10.	Estimation of Chlorides present in water sample	03	CO4
11.	Estimation of Dissolved Oxygen(D.O)in water sample	03	CO5
12.	Determination of pH using pH meter	03	CO5
13.	Determination of conductivity of water and adjusting ionic strength required level.	03	CO5
14.	Determination of turbidity of water	03	CO5
15.	Estimation of total solids present in water sample	03	CO5
	Total:	45	

Objectives:

Upon completion of the course the student shall be able to

- 1.0 Practice volumetric measurements (using pipettes, measuring jars, volumetric flask, burettes) and gravimetric measurements (using different types of balances), making dilutions, etc.To identify the chemical compounds and solutions by senses.
- 2.0 Practice making standard solutions with pre weighed salts and to make solutions of desired dilutions using appropriate techniques.
- 3.0 Conduct titrations adopting standard procedures and using Std. Na_2CO_3 solution for estimation of HCl
- 4.0 Conduct titrations adopting standard procedures and using Std. HCl solution for estimation of NaOH
- 5.0 Conduct titrations adopting standard procedures and using Std. NaOH solution for estimation of H_2SO_4
- 6.0 Conduct titrations adopting standard procedures and using Std. KMnO_4 solution for estimation of Mohr's Salt
- 7.0 Conduct titrations adopting standard procedures to determine the acidity of given samples of water (One ground water and one surface / tap water, and rain water if available)
- 8.0 Conduct titrations adopting standard procedures to determine the alkalinity of given samples of water (One ground

- water and one surface / tap water)
- 9.0 Conduct titrations adopting standard procedures to determine the total hardness of given samples of water (One ground water and one surface / tap water) using Std. EDTA solution
- 10.0 Conduct titrations adopting standard procedures to determine the chlorides present in the given samples of water and wastewater (One ground water and one surface / tap water)
- 11.0 Conduct the test using titrimetric / electrometric method to determine Dissolved Oxygen (D.O) in given water samples (One sample from closed container and one from open container / tap water)
- 12.0 Conduct the test on given samples of water / solutions (like soft drinks, sewage, etc.) to determine their pH using standard pH meter
- 13.0 Conduct the test on given samples of water / solutions
- To determine conductivity
 - To adjust the ionic strength of the sample to the desired value
- 14.0 Conduct the test on given samples of solutions (coloured and non coloured) to determine their turbidity in NTU
- 15.0 To determine the total solids present in given samples of water (One ground water and one surface / tap water)

Competencies and Key competencies to be achieved by the student

Name of the Experiment (No of Periods)	Competencies	Key competencies
Familiarization of methods for Volumetric analysis. Recognition of chemical substances And solutions (03)	-	--
Preparation of Std Na_2CO_3 and making solutions of different dilution(03)	<ul style="list-style-type: none"> ▪ Weighing the salt to the accuracy of .01 mg ▪ Measuring the water with volumetric flask, measuring jar, volumetric pipette and graduated pipette ▪ Making appropriate dilutions 	<ul style="list-style-type: none"> ▪ Weighing the salt to the accuracy of .01 mg ▪ Measuring the water with volumetric flask, measuring jar, volumetric pipette and graduated pipette ▪ Making appropriate dilutions
Estimation of HCl solution using Std. Na_2CO_3 solution (03)	<ul style="list-style-type: none"> ▪ Cleaning the glassware and rinsing with appropriate solutions 	<ul style="list-style-type: none"> ▪ Making standard solutions ▪ Measuring accurately the standard solutions and titrants ▪ Effectively Controlling the flow of the titrant ▪ Identifying the end point ▪ Making accurate observations
Estimation of NaOH using Std.HCl solution (03)	<ul style="list-style-type: none"> ▪ Making standard solutions ▪ Measuring accurately the standard solutions and titrants 	
Estimation of H_2SO_4 using Std.NaOH solution (03)	<ul style="list-style-type: none"> ▪ Filling the burette with titrant 	
Estimation of Mohr's Salt using Std. KMnO_4 (03)	<ul style="list-style-type: none"> ▪ Fixing the burette to the stand 	
Determination of acidity of water sample (03)	<ul style="list-style-type: none"> ▪ Effectively Controlling the flow of the titrant 	

Determination of alkalinity of water sample (03)	<ul style="list-style-type: none"> ▪ Identifying the end point ▪ Making accurate observations ▪ Calculating the results 	
Determination of total hardness of water using Std. EDTA solution (03)		
Estimation of Chlorides present in water sample (03)		
Estimation of Dissolved Oxygen(D.O) in water sample (By titration method) (03)		
Determination of pH using pH meter (03)	<ul style="list-style-type: none"> ▪ Familiarize with instrument ▪ Choose appropriate 'Mode' / 'Unit' ▪ Prepare standard solutions / buffers, etc. ▪ Standardize the instrument with appropriate standard solutions ▪ Plot the standard curve ▪ Make measurements accurately ▪ Follow Safety precautions 	<ul style="list-style-type: none"> ▪ Prepare standard solutions / buffers, etc. ▪ Standardize the instrument with appropriate standard solutions ▪ Plot the standard curve ▪ Make measurements accurately
Determination of conductivity of water and adjusting ionic strength to required level (03)		
Determination of turbidity of water (03)		
Estimation of total solids present in water sample (03)	<ul style="list-style-type: none"> ▪ Measuring the accurate volume and weight of sample ▪ Filtering and air drying without losing any filtrate ▪ Accurately weighing the filter paper, crucible and filtrate ▪ Drying the crucible in an oven 	<ul style="list-style-type: none"> ▪ Measuring the accurate volume and weight of sample ▪ Filtering and air drying without losing any filtrate ▪ Accurately weighing the filter paper, crucible and filtrate

SCHEME OF VALUATION

A) Writing Chemicals, apparatus ,principle and procedure

5M

B) Demonstrated competencies

20M

Making standard solutions

Measuring accurately the standard solutions and titrants

Effectively controlling the flow of the titrant

Identifying the end point

Making accurate observations

C) Viva-voce

5M

Total

30M

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-110 (common to all branches)	Computer Fundamentals Lab	3	90	40	60

Time schedule:

S.No.	Chapter/Unit Title	No. of sessions each of 3 periods duration	No.of Periods
1.	Computer hardware Basics	2	6
2.	Windows Operating System	2	6
3.	MS Word	8	24
4.	MS Excel	7	21
5.	MS PowerPoint	5	15
6.	Adobe Photoshop	6	18
Total periods		30	90

S.No.	Chapter/Unit Title	No.of Periods	CO's Mapped
1.	Computer hardware Basics	6	CO1
2.	Windows Operating System	6	CO1
3.	MS Word	24	CO2
4.	MS Excel	21	CO3
5.	MS PowerPoint	15	CO4
6.	Adobe Photoshop	18	CO5
Total periods		90	

Course Objectives	
	i)To know Hardware Basics ii)To familiarize operating systems iii)To use MS Office effectively to enable to students use these skills in future courses iv) To use Adobe Photoshop in image editing.

Course Outcomes	At the end of the course students will be able to		
	CO1	C-110.1	Identify hardware and software components
	CO2	C-110.2	Prepare documents with given specifications using word processing software
	CO3	C-110.3	Use Spread sheet software to make calculation and to draw various graphs / charts.
	CO4	C-110.4	Use Power point software to develop effective presentation for a given theme or topic.
	CO5	C-110.5	Edit digital or scanned images using Photoshop

CO-PO/PSO MATRIX

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
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AG-110.1	3	3	3	3	3	3	3	3	2	3
AG-110.2	3	3	3	3	3	3	3	3	2	3
AG-110.3	3	3	3	3	3	3	3	3	2	3
AG-110.4	3	3	3	3	3	3	3	3	2	3
AG-110.5	3	3	3	3	3	3	3	3	2	3
Average	3	3	3	3	3	3	3	3	2	3

3=Strongly mapped , 2=moderately mapped, 1=slightly mapped

Learning Outcomes:

I. Computer Hardware Basics

1. a).To Familiarize with Computer system and hardware connections
b).To Start and Shut down Computer correctly
c).To check the software details of the computer
2. To check the hardware present in your computer

II. Windows’s operating system

3. To Explore Windows Desktop
4. Working with Files and Folders
5. Windows Accessories: Calculator – Notepad – WordPad – MS Paint

III. Practice with MS-WORD

6. To familiarize with Ribbon layout of MS Word
Home – Insert- Page layout – References – Review- View.
7. To practice Word Processing Basics
8. To practice Formatting techniques
9. To insert a table of required number of rows and columns
10. To insert Objects, Clipart and Hyperlinks
11. To use Mail Merge feature of MS Word
12. To use Equations and symbols features

IV.Practice with MS-EXCEL

13. To familiarize with MS-EXCEL layout
14. To access and enter data in the cells
15. To edit a spread sheet- Copy, Cut, Paste, and selecting Cells
16. To use built in functions and Formatting Data
17. To create Excel Functions, Filling Cells
18. To enter a Formula for automatic calculations
19. To sort and filter data in table.
20. To present data using Excel Graphs and Charts.
21. To develop lab reports of respective discipline.
22. To format a Worksheet in Excel, Page Setup and Print

V. Practice with MS-POWERPOINT

23. To familiarize with Ribbon layout features of PowerPoint 2007.
24. To create a simple PowerPoint Presentation
25. To set up a Master Slide in PowerPoint
26. To insert Text and Objects
27. To insert a Flow Charts
28. To insert a Table
29. To insert a Charts/Graphs
30. To insert video and audio
31. To practice Animating text and objects
32. To Review presentation

VI. Practice with Adobe Photoshop

33. To familiarize with standard toolbox
34. To edit a photograph.
35. To insert Borders around photograph.
36. To change Background of a Photograph.
37. To change colors of Photograph.
38. To prepare a cover page for the book in your subject area.
39. To adjust the brightness and contrast of the picture so that it gives an elegant look.
40. To type a word and apply the shadow emboss effects.

Key competencies:

Expt No	Name of Experiment	Competencies	Key competencies
1 (a).	To familiarize with Computer system and hardware connections	<ol style="list-style-type: none"> a. Identify the parts of a Computer system: i). CPU ii). Mother Board iii) Monitor iv) CD/DVD Drive v) Power Switch vi) Start Button vii) Reset Button b. Identify and connect various peripherals c. Identify and connect the cables used with computer system d. Identify various ports on CPU and connect Keyboard & Mouse 	Connect cables to external hardware and operate the computer
1 (b).	To Start and Shut down Computer correctly	<ol style="list-style-type: none"> a. Log in using the password b. Start and shut down the computer c. Use Mouse and Key Board 	<ol style="list-style-type: none"> a. Login and logout as per the standard procedure b. Operate mouse & Key Board
1 (c).	To Explore Windows	<ol style="list-style-type: none"> a. Familiarize with Start Menu, 	<ol style="list-style-type: none"> a. Access application

	Desktop	<p>Taskbar, Icons and Shortcuts</p> <p>b. Access application programs using Start menu, Task manager</p> <p>c. Use Help support</p>	<p>programs using Start menu</p> <p>b. Use taskbar and Task manager</p>
2.	To check the software details of the computer	<p>a. Find the details of Operating System being used</p> <p>b. Find the details of Service Pack installed</p>	Access the properties of computer and find the details
3.	To check the hardware present in your computer	<p>a. Find the CPU name and clock speed</p> <p>b. Find the details of RAM and Hard disk present</p> <p>c. Access Device manager using Control Panel and check the status of devices like mouse and key board</p> <p>d. Use My Computer to check the details of Hard drives and partitions</p> <p>e. Use the Taskbar</p>	<p>a. Access device manager and find the details</p> <p>b. Type /Navigate the correct path and Select icon related to the details required</p>
4.	Working with Files and Folders	<p>a. Create folders and organizing files in different folders</p> <p>b. Use copy / paste move commands to organize files and folders</p>	<p>a. Create files and folders Rename , arrange and search for the required folder/file</p>
	Working with Files and Folders Continued....	<p>c. Arrange icons – name wise, size, type, Modified</p> <p>d. Search a file or folder and find its path</p> <p>e. Create shortcut to files and folders (in other folders) on Desktop</p> <p>f. Familiarize with the use of My Documents</p> <p>g. Familiarize with the use of Recycle Bin</p>	<p>b. Restore deleted files from Recycle bin</p>

5.	To use Windows Accessories: Calculator – Notepad – WordPad – MS Paint	<ul style="list-style-type: none"> a. Familiarize with the use of Calculator b. Access Calculator using Run command c. Create Text Files using Notepad and WordPad and observe the difference in file size d. Use MS paint and create .jpeg, .bmp files using MS Paint 	<ul style="list-style-type: none"> a. Use windows accessories and select correct text editor based on the situation. b. Use MS pain to create /Edit pictures and save in the required format.
6.	To familiarize with Ribbon layout of MS word. – Home – Insert- page layout- References-Review-View	<ul style="list-style-type: none"> a. Create/Open a document b. Use Save and Save as features c. Work on two Word documents simultaneously d. Choose correct Paper size and Printing options 	<ul style="list-style-type: none"> a. Create a Document and name appropriately and save b. Set paper size and print options
7.	To practice Word Processing Basics	<ul style="list-style-type: none"> a. Typing text b. Keyboard usage c. Use mouse (Left click / Right click / Scroll) d. Use Keyboard shortcuts e. Use Find and Replace features in MS- word f. Use Undo and Redo Features g. Use spell check to correct Spellings and Grammar 	<ul style="list-style-type: none"> a. Use key board and mouse to enter/edit text in the document. b. Use shortcuts c. Use spell check/ Grammar features for auto corrections.
8.	To practice Formatting techniques	<ul style="list-style-type: none"> a. Formatting Text b. Formatting Paragraphs c. Setting Tabs d. Formatting Pages e. The Styles of Word f. Insert bullets and numbers g. Themes and Templates h. Insert page numbers, header and footer 	<ul style="list-style-type: none"> a. Format Text and paragraphs and use various text styles. b. Use bullets and numbers to create lists c. Use Templates /Themes d. Insert page numbers date, headers and footers
9.	To insert a table of required number of rows and columns	<ul style="list-style-type: none"> a. Edit the table by adding the fields – Deleting rows and columns –inserting sub table – marking borders. Merging and splitting of cells in a Table b. Changing the background colour of the table c. Use table design tools 	<ul style="list-style-type: none"> a. Insert table in the word document and edit b. Use sort option for arranging data.

		<p>d. Use auto fit – fixed row/ column height/length – Even distribution of rows / columns features</p> <p>e. Convert Text to table and Table to Text</p> <p>f. Use Sort feature of the Table to arrange data in ascending/descending order</p>	
10.	To Insert objects, clipart and Hyperlinks	<p>a. Create a 2-page document. & Insert hyperlinks and t Bookmarks.</p> <p>b. Create an organization chart</p> <p>c. Practice examples like preparing an Examination schedule notice with a hyperlink to Exam schedule table.</p>	<p>a. Insert hyperlinks & Bookmarks</p> <p>b. Create organization charts/flow charts</p>
11.	To Use Mail merge feature of MS Word	<p>a. Use mail merge to prepare individually addressed letters</p> <p>b. Use mail merge to print envelopes.</p>	Use Mail merge feature
12.	To use Equations and symbols features.	<p>a. Explore various symbols available in MS Word</p> <p>b. Insert a symbol in the text</p> <p>c. Insert mathematical equations in the document</p>	Enter Mathematical symbols and Equations in the word document
13.	To Practice with MS-EXCEL	<p>a. Open /create an MS Excel spreadsheet and familiarize with MS Excel 2007 layout like MS office Button-</p> <p>b. Use Quick Access Toolbar- Title Bar- Ribbon-Worksheets- Formula Bar-Status Bar</p>	<p>a. Familiarize with excel layout and use</p> <p>b. Use various features available in toolbar</p>
14.	To access and Enter data in the cells	<p>a. Move Around a Worksheets- Quick access -Select Cells</p> <p>b. Enter Data-Edit a Cell-Wrap Text-Delete a Cell Entry-Save a File-Close Excel</p>	<p>a. Access and select the required cells by various addressing methods</p> <p>b. Enter data and edit</p>
15.	To edit spread sheet Copy, Cut, Paste, and selecting cells	<p>a. Insert and Delete Columns and Rows-Create Borders-Merge and Center</p> <p>b. Add Background Color-Change</p>	Format the excel sheet

		<p>the Font, Font Size, and Font Color</p> <p>c. Format text with Bold, Italicize, and Underline-Work with Long Text-Change a Column's Width</p>	
16.	To use built in functions and Formatting Data	<p>a. Perform Mathematical Calculations verify -AutoSum</p> <p>b. Perform Automatic Calculations-Align Cell Entries</p>	Use built in functions in Excel
17.	To enter a Formula for automatic calculations	<p>a. Enter formula</p> <p>b. Use Cell References in Formulae</p> <p>c. Use Automatic updating function of Excel Formulae</p> <p>d. Use Mathematical Operators in Formulae</p> <p>e. Use Excel Error Message and Help</p>	Enter formula for automatic calculations
18.	To Create Excel Functions, Filling Cells	<p>a. Use Reference Operators</p> <p>b. Work with sum, Sum if , Count and Count If Functions</p> <p>c. Fill Cells Automatically</p>	<p>a. Create Excel sheets involving cross references and equations</p> <p>b. Use the advanced functions for conditional calculations</p>
19.	To sort and filter data in table	<p>a. Sort data in multiple columns</p> <p>b. Sort data in a row</p> <p>c. Sort data using Custom order</p> <p>d. Filter data in work sheet</p>	<p>a. Refine the data in a worksheet and keep it organized</p> <p>b. Narrow a worksheet by selecting specific choice</p>
20.	To Practice Excel Graphs and Charts	<p>a. Produce an Excel Pie Chart</p> <p>b. Produce</p> <p>c. Excel Column Chart</p>	<p>a. Use data in Excel sheet to Create technical charts and graphs Produce Excel Line Graph</p> <p>b. Produce a Pictograph in Excel</p>
21.	To develop lab reports of respective discipline	Create Lab reports using MS Word and Excel	a. Insert Practical subject name in Header and page numbers in Footer
22.	To format a Worksheet in Excel, page setup and print	<p>a. Shade alternate rows of data</p> <p>b. Add currency and percentage</p>	<p>a. Format Excel sheet</p> <p>b. Insert headers</p>

		<ul style="list-style-type: none"> symbols c. Change height of a row and width of a column d. Change data alignment e. Insert Headers and Footers f. Set Print Options and Print 	& footers and print
23.	To familiarize with Ribbon layout & features of PowerPoint 2007.	<ul style="list-style-type: none"> Use various options in PowerPoint a. Home b. Insert c. Design d. Animation e. Slideshow f. View g. Review 	Access required options in the tool bar
24.	To create a simple PowerPoint Presentation	<ul style="list-style-type: none"> a. Insert a New Slide into PowerPoint b. Change the Title of a PowerPoint Slide c. PowerPoint Bullets d. Add an Image to a PowerPoint Slide e. Add a Textbox to a PowerPoint slide 	<ul style="list-style-type: none"> a. Create simple PowerPoint presentation with photographs/ClipArt and text boxes b. Use bullets option
25.	To Set up a Master Slide in PowerPoint and add notes	<ul style="list-style-type: none"> a. Create a PowerPoint Design Template b. Modify themes c. Switch between Slide master view and Normal view d. Format a Design Template Master Slide e. Add a Title Slide to a Design Template f. The Slide Show Footer in PowerPoint g. Add Notes to a PowerPoint Presentation 	<ul style="list-style-type: none"> a. Setup Master slide and format b. Add notes
26.	To Insert Text and Objects	<ul style="list-style-type: none"> a. Insert Text and objects b. Set Indents and line spacing c. Insert pictures/ clipart d. Format pictures e. Insert shapes and word art f. Use 3d features g. Arrange objects 	<ul style="list-style-type: none"> Insert Text and Objects Use 3d features
27.	To insert a Flow Chart / Organizational Charts	<ul style="list-style-type: none"> a. Create a Flow Chart in PowerPoint b. Group and Ungroup Shapes 	Create organizational charts and flow charts using smart art

		c. Use smart art	
28.	To insert a Table	<ul style="list-style-type: none"> a. PowerPoint Tables b. Format the Table Data c. Change Table Background d. Format Series Legend 	Insert tables and format
29.	To insert a Charts/Graphs	<ul style="list-style-type: none"> a. Create 3D Bar Graphs in PowerPoint b. Work with the PowerPoint Datasheet c. Format a PowerPoint Chart Axis d. Format the Bars of a Chart e. Create PowerPoint Pie Charts f. Use Pie Chart Segments g. Create 2D Bar Charts in PowerPoint h. Format the 2D Chart e. Format a Chart Background 	Create charts and Bar graphs, Pie Charts and format.
30.	To Insert audio & video, Hyperlinks in a slide Add narration to the slide	<ul style="list-style-type: none"> a. Insert sounds in the slide and hide the audio symbol b. Adjust the volume in the settings c. Insert video file in the format supported by PowerPoint in a slide d. Use automatic and on click options e. Add narration to the slide f. Insert Hyperlinks 	<ul style="list-style-type: none"> a. Insert Sounds and Video in appropriate format. b. Add narration to the slide c. Use hyperlinks to switch to different slides and files
31.	To Practice Animation effects	<ul style="list-style-type: none"> a. Apply transitions to slides b. To explore and practice special animation effects like Entrance, Emphasis, Motion Paths & Exit 	Add animation effects
32.	Reviewing presentation	<ul style="list-style-type: none"> a. Checking spelling and grammar b. Previewing presentation c. Set up slide show d. Set up resolution e. Exercise with Rehearse Timings feature in PowerPoint f. Use PowerPoint Pen Tool during slide show g. Saving h. Printing presentation (a) Slides 	<ul style="list-style-type: none"> a. Use Spell check and Grammar feature b. Setup slide show c. Add timing to the slides d. Setup automatic slide show

		(b) Hand-out	
33	To familiarize with standard toolbox	<ul style="list-style-type: none"> a. Open Adobe Photoshop b. Use various tools such as <ul style="list-style-type: none"> i. The Layer Tool ii. The Color & Swatches Tool iii. Custom Fonts & The Text Tool iv. Brush Tool v. The Select Tool vi. The Move Tool vii. The Zoom Tool viii. The Eraser ix. The Crop Tool x. The Fill Tool 	Open a photograph and save it in Photoshop
34	To edit a photograph	<ul style="list-style-type: none"> a. Use the Crop tool b. Trim edges c. Change the shape and size of a photo d. Remove the part of photograph including graphics and text 	a. Able to edit image by using corresponding tools.
35	To insert Borders around photograph	<ul style="list-style-type: none"> a. Start with a single background layer b. Bring the background forward c. Enlarge the canvas d. Create a border color e. Send the border color to the back f. Experiment with different colors 	Able to create a border or frame around an image to add visual interest to a photo
36	To change Background of a Photograph	<ul style="list-style-type: none"> a. open the foreground and background image b. Use different selection tools to paint over the image c. Copy background image and paste it on the foreground. d. Resize and/or drag the background image to reposition. e. In the Layers panel, drag the background layer below the foreground image layer. 	Able to swap background elements using the Select and Mask tool and layers.

37	To change colors of Photograph	a. Change colors using: i) Color Replacement tool ii) Hue/Saturation adjustment layer tool	Able to control color saturation
38	To prepare a cover page for the book in subject area	a. open a file with height 500 and width 400 for the cover page. b. apply two different colors to work area by dividing it into two parts using Rectangle tool. c. Copy any picture and place it on work area→ resize it using free transform tool. d. Type text and apply color and style e. Apply effects using blended options	Able to prepare cover page for the book
39	To adjust the brightness and contrast of picture to give an elegant look	a. open a file. b. Go to image→ adjustments→ Brightness/Contrast. c. adjust the brightness and contrast. d. Save the image.	Able to control brightness/contrast.
40	To type a word and apply the shadow emboss effects	a. open a file b. Select the text tool and type text. c. Select the typed text go to layer→ layer style→ blended option→ drop shadow, inner shadow, bevel and emboss→ contour→ satin→ gradient overlay d. Save the image.	Able to apply shadow emboss effects

Table specifying the scope of syllabus to be covered for unit tests

Unit Test	Learning outcomes to be covered
Unit test-1	From 1 to 8
Unit test-2	From 9 to 22
Unit test-3	From 23 to 40

I Year Internal Lab Examination
UNIT TEST - I
MODEL QUESTION PAPER
COMPUTER FUNDAMENTALS LAB

SCHEME: C-20
MAX MARKS:40

SUBJ CODE: AG-110
Time:90Min

1. Identify the internal hardware components of a PC and assemble them.
2. Identify the external components or peripherals of a PC and connect them.
3. Identify the components on motherboard.
4. Perform the process of placing processor on CPU slot.
5. Perform the process of removing and placing the RAM in the corresponding slot.
6. Identify the AGOS battery and test whether it is working it or not.
7. Find details of following:
 - a) Operating System being used.
 - b) Processor name
 - c) RAM
 - d) Hard disk
8. Create a folder by your name, search a file or folder and find its path.
9. Draw the National Flag using MS Paint.
10. Create a word document that contains TEN names of your classmates (boys-5 & girls-5) and perform the following tasks:
 - a) Save the document to your desktop.
 - b) Sort the names in each list alphabetically.
 - c) Set line spacing to 1.15.
 - d) Use bullet points for the names in both lists separately.

I Year Internal Lab Examination
UNIT TEST - II
MODEL QUESTION PAPER
COMPUTER FUNDAMENTALS LAB

SCHEME: C-20
MAX MARKS:40

SUBJ CODE:AG-110
Time:90Min

1. Write individually addressed letters to your friends about the Republic Day celebration using Mail Merge.
2. Create a Word document about your college and insert page numbers in footer and College Name in header.
3. Create your class time table using Tables in MS Word.
4. Create a 2-page document about your College & insert hyperlinks for courses offered in the college and insert Bookmarks next to College Name.
5. Write individually addressed letters to your friends (at least 5 members) to intimate the External Examination time table using Mail Merge.
6. Write an equation $\frac{(x+y)^2}{(x-y)^2} = \frac{x^2+2xy+y^2}{x^2-2xy+y^2}$ in MS word.
7. Create the organizational structure of your college in MS Word.
8. Create a spreadsheet by totalling marks of 3 or more subjects, then calculate percentage and hence find grade based on boundary conditions of FIVE students:
Grades O \geq 90%, A \geq 80%, B \geq 70%, C \geq 60%, D \geq 50%, E \geq 40%, F $<$ 40%
9. Create an Excel spreadsheet for the following data, making sure that the cell marked with Category (A1) is pasted in cell A1 in the spreadsheet and perform the questions below.

Category (A1)	Product Name	Quantity	Inventory	Price per Unit	Total Price
Office Supplies	Binder	2	20	12.99	25.98
Office Supplies	Pencil	20	20	0.99	
Electronics	Samsung 4K Smart TV	1	5	399.00	
Electronics	Bluetooth Speakers	4	5	44.49	

Computers	Lenovo X230 12in Laptop	2	2	279.90	
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a) Change the format of the “Total Price” column to “Currency” format.

b) Calculate Total Price by writing formula.

c) Turn on filtering for the table.

d) Sort the table by column “Category” from A to Z.

10. Create a spreadsheet to calculate Cumulative monthly attendance for a period of Three months.

**Year Internal Lab Examination
UNIT TEST - III
MODEL QUESTION PAPER
COMPUTER FUNDAMENTALS LAB**

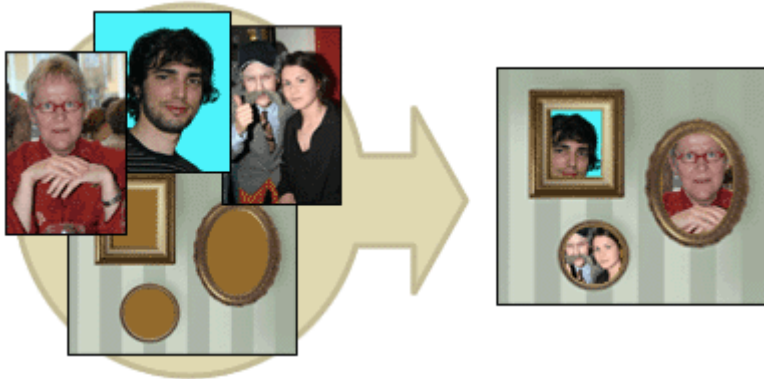
SCHEME: C-20

SUBJ CODE: AG-110

MAX MARKS:40

Time:90Min

1. Create a PowerPoint Presentation about your College in 5 slides only.
2. Create a PowerPoint Presentation on Computer Hardware in minimum 5 slides.
3. Create a PowerPoint Presentation on Computer Fundamentals with Entrance, Emphasis effects in minimum 5 slides.
4. Create a PowerPoint Presentation on any topic with special animation effects like Entrance, Motion Paths &Exit.
5. Resize the image using Photoshop.
6. Change the background of a Photograph.
7. Edit an image by using
 - a) Crop tool.
 - b) Resize the image
 - c) Save the new image with new name keeping original image as it is.
8. A Picture of two parrots (parrots.jpg) is given to you. Make anyone of one of the parrots in Black & White.
9. Convert a color image to monochrome and improve quality of photograph.
10. Copy three pictures and fit into the empty frames.



BOARD DIPLOMA EXAMINATIONS
DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
MODEL PRACTICAL QUESTION PAPER-YEAR END EXAM
COMPUTER FUNDAMENTALS LAB

SCHEME: C-20
MAX MARKS:60

SUBJ CODE:AG-110
TIME: 3HOURS

1. Identify the internal hardware components of a PC and assemble them.
2. Identify the external components or peripherals of a PC and connect them.
3. Write the procedure to create the files and folders
4. Write the procedure to access Calculator, Paint and Notepad application
5. Write the procedure to perform the following in MS Word
 - (a) Change the Font Size
 - (b) Change the Font Style
 - (c) Change the Text Size
6. Write the procedure to perform the following in MS Word
 - (a)Change the Font Color.
 - (b)Use Various Text Alignment Options.
 - (c)Format text in Bold, Italic and Underline.
7. Create the hierarchy of your family in MS Word.
8. Write the procedure to perform the following in MS Word:
 - (a) Insert a Table
 - (b) Add a Row
 - (c) Add a column
 - (d) Delete a Row
 - (e) Delete a column
9. Write the procedure to use Equation $\frac{(x+y)^2}{(x-y)^2} = \frac{x^2+2xy+y^2}{x^2-2xy+y^2}$ and Symbols.
10. Write the procedure to perform the following in MS Excel
 - (a) To Modify Column Width
 - (b) To Modify Row Height
 - (c) Format text in Bold, Italic, and Underline.
11. Write the procedure to create charts and Graphs in MS Excel.
12. Write the procedure to create simple Power Point Presentation on your college in Three slides.
13. Write the procedure to perform Animation on Text and Objects in your presentation.

14. Take a photographic image. Give a title for the image. Put the border. Write your names. Write the Name of Institution and Place.
15. Prepare a cover page for the book in your subject area. Plan your own design.
16. You are given a picture of a flower and associated background (Extract.jpg). Extract the Flower only from that and organize it on a background. Select your own background for organization.
17. You are given a picture (BrightnessContrast.jpg). Adjust the brightness and contrast of the picture so that it gives an elegant look.
18. You are given a picture (position.jpg). Position the picture preferably on a plain background of a color of your choice - Positioning include rotation and scaling.
19. Remove the arrows and text from the given photographic image (Filename: photo.jpg).
20. Type a word; apply the following effects. Shadow Emboss.

THIRD SEMESTER

**ANIMATION AND GRAPHICS ENGINEERING
SCHEME OF INSTRUCTIONS AND EXAMINATION
CURRICULUM-2020 (III Semester)**

Sub Code	Name of the Subject	Instruction Periods/Week		Total Periods Per Semester	Scheme Of Examinations			
		Theory	Practicals		Duration (hrs)	Sessional Marks	End Exam Marks	Total Marks
THEORY SUBJECTS								
AG-301	Mathematics –II	4		60	3	20	80	100
AG-302	Graphics Designing	5	-	75	3	20	80	100
AG-303	Elements of Film Technology	5	-	75	3	20	80	100
AG-304	2D Digital Animation	5	-	75	3	20	80	100
AG-305	3D animation and Graphics	5	-	75	3	20	80	100
PRACTICAL SUBJECTS								
AG-306	Graphics Designing Lab	-	3	45	3	40	60	100
AG-307	2D Digital Animation Lab	-	3	45	3	40	60	100
AG-308	3D animation and Graphics Lab	-	3	45	3	40	60	100
AG-309	2D Graphics Lab		3	45	3	40	60	100
AG-310	Mini Project		6	90	3	40	60	100
	Total	24	18	630		300	700	1000

AG-301 common with all branches

AG-303,304,307,309,310 common with DAME branch

C-20

ENGINEERING MATHEMATICS-II

Course Code	Course Title	No. of Periods/week	Total No. of periods	Marks for FA	Marks for SA
AG-301	Engineering Mathematics-II	4	60	20	80

S.No.	Unit Title	No. of periods	COs mapped
1	Indefinite Integration	22	CO1
2	Definite Integration and its applications	24	CO2
3	Differential Equations of first order	14	CO3
Total Periods		60	

Course Objectives	<ul style="list-style-type: none"> (i) To understand the concepts of indefinite integrals and definite integrals with applications to engineering problems. (ii) To understand the formation of differential equations and learn various methods of solving them.
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Course Outcomes	CO1	Integrate various functions using different methods.
	CO2	Evaluate definite integrals with applications.
	CO3	Obtain differential equations and solve differential equations of first order and first degree.

ENGINEERING MATHEMATICS – II

Learning Outcomes

Unit-I

C.O. 1 Integrate various functions using different methods.

L.O.1.1. Explain the concept of Indefinite integral as an anti-derivative.

1.2. State the indefinite integral of standard functions and properties of Integrals $\int (u + v) dx$ and $\int ku dx$ where k is constant and u, v are functions of x .

1.3. Solve integration problems involving standard functions using the above rules.

1.4. Evaluate integrals involving simple functions of the following type by the method of substitution.

i) $\int f(ax + b) dx$ where $f(x)dx$ is in standard form.

ii) $\int [f(x)]^n f'(x) dx$

iii) $\int f'(x)/[f(x)] dx$

iv) $\int f\{g(x)\} g'(x) dx$

1.5. Find the integrals of $\tan x$, $\cot x$, $\sec x$ and $\operatorname{cosec} x$ using the above.

1.6. Evaluate the integrals of the form $\int \sin^m x \cos^n x dx$ where m and n are suitable positive integers.

1.7. Evaluate integrals of suitable powers of $\tan x$ and $\sec x$.

1.8. Evaluate the Standard integrals of the functions of the type

i) $\frac{1}{a^2 + x^2}, \frac{1}{a^2 - x^2}, \frac{1}{x^2 - a^2}$

ii) $\frac{1}{\sqrt{a^2 + x^2}}, \frac{1}{\sqrt{a^2 - x^2}}, \frac{1}{\sqrt{x^2 - a^2}}$

iii) $\sqrt{x^2 - a^2}, \sqrt{x^2 + a^2}, \sqrt{a^2 - x^2}$

1.9. Evaluate the integrals of the type

$$\int \frac{1}{a+b\sin\theta} d\theta, \int \frac{1}{a+b\cos\theta} d\theta \text{ and } \int \frac{1}{a\cos\theta+b\sin\theta+c} d\theta.$$

1.10. Evaluate integrals using decomposition method.

1.11. Solve problems using integration by parts.

1.12 Use Bernoulli's rule for evaluating the integrals of the form $\int u.v dx$.

1.13. Evaluate the integrals of the form $\int e^x [f(x) + f'(x)] dx$.

Unit-II

C.O.2 Evaluate definite integrals with applications.

L.O.2.1. State the fundamental theorem of integral calculus

2.2. Explain the concept of definite integral.

2.3. Solve problems on definite integrals over an interval using the above concept.

2.4. State various properties of definite integrals.

2.5. Evaluate simple problems on definite integrals using the above properties.

Syllabus for Unit test-I completed

2.6. Explain definite integral as a limit of sum by considering an area.

2.7. Find the areas under plane curves and area enclosed between two curves using integration.

2.8. Obtain the mean value and root mean square value of the functions in any given interval.

2.9. Obtain the volumes of solids of revolution.

2.10. Solve some problems using Trapezoidal rule, Simpson's 1/3 rule for approximation of integrals.

Unit -III

C.O. 3 Form differential equations and solve differential equations of first order and first degree.

L.O.3.1. Define a Differential equation, its order and degree

3.2 Find order and degree of a given differential equation.

3.3 Form a differential equation by eliminating arbitrary constants.

3.4 Solve the first order and first degree differential equations by variables separable method.

3.5 Solve Homogeneous differential equation of first order and first degree.

3.6 Solve exact differential equation of first order and first degree.

3.7 Solve linear differential equation of the form $dy/dx + Py = Q$, where P and Q are functions of x or constants.

3.8 Solve Bernoulli's differential equation reducible to linear form.

3.9 Solve simple problems arising in engineering applications.

Syllabus for Unit test-II completed

Engineering Mathematics – II

CO/PO – Mapping

AG-301	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	2	2				3	1	2
CO2	3	3	3	3				3	3	3
CO3	3	3	3	3				3	3	3
Avg	3	2.6	2.6	2.6				3	2.3	2.6

3 = Strongly mapped (High), **2** = Moderately mapped (Medium), **1** = Slightly mapped (Low)

PO5: Appropriate quiz programme may be conducted at intervals and duration as decided by concerned teacher.

PO6: Seminars on applications of mathematics in various engineering disciplines are to be planned and conducted.

PO7: Such activities are to be planned that students visit library to refer standard books on Mathematics and latest updates in reputed national and international journals, attending seminars, learning mathematical software tools.

PSO1: An ability to understand the concepts of basic mathematical techniques and to apply them in various areas like computer programming, civil constructions, fluid dynamics, electrical and electronic systems and all concerned engineering disciplines.

PSO2: An ability to solve the Engineering problems using latest software tools, along with analytical skills to arrive at faster and appropriate solutions.

PSO3: Wisdom of social and environmental awareness along with ethical responsibility to have a successful career as an engineer and to sustain passion and zeal for real world technological applications.

C-20

Engineering Mathematics – II

PO- CO – Mapping strength

PO no	Mapped with CO no	CO periods addressing PO in column I		Level (1,2 or 3)	Remarks
		Number	%		
1	CO1, CO2, CO3	60	100%	3	>40% Level 3 Highly addressed 25% to 40% Level 2 Moderately addressed 5% to 25% Level 1 Low addressed <5% Not addressed
2	CO1, CO2, CO3	60	100%	3	
3	CO1, CO2, CO3	60	100%	3	
4	CO2, CO3	38	63.3%	3	
5					
6					
7					
PSO 1	CO1, CO2, CO3	60	100%	3	
PSO 2	CO1, CO2, CO3	40	66.6%	3	
PSO 3	CO1, CO2, CO3	48	75%	3	

ENGINEERING MATHEMATICS – II

COURSE CONTENTS**Unit-I****Indefinite Integration .**

1. Integration regarded as anti-derivative – Indefinite integrals of standard functions. Properties of indefinite integrals. Integration by substitution or change of variable. Integrals of $\tan x$, $\cot x$, $\sec x$, $\operatorname{cosec} x$. Integrals of the form $\int \sin^m x \cdot \cos^n x dx$, where at least one of m and n is odd positive integers. Integrals of suitable powers of $\tan x$, $\sec x$ and $\operatorname{cosec} x \cdot \cot x$ by substitution.

Evaluation of integrals which are reducible to the following forms:

$$\begin{aligned} \text{i)} & \frac{1}{a^2 + x^2}, \frac{1}{a^2 - x^2}, \frac{1}{x^2 - a^2} \\ \text{ii)} & \frac{1}{\sqrt{a^2 + x^2}}, \frac{1}{\sqrt{a^2 - x^2}}, \frac{1}{\sqrt{x^2 - a^2}} \\ \text{iii)} & \sqrt{x^2 - a^2}, \sqrt{x^2 + a^2}, \sqrt{a^2 - x^2} \end{aligned}$$

Integration by decomposition of the integrand into simple rational, algebraic functions.

Integration by parts, Bernoulli's rule and integrals of the form $\int e^x [f(x) + f'(x)] dx$.

Unit-II**Definite Integral and its applications:**

2. Definite integral-fundamental theorem of integral calculus, properties of definite integrals, evaluation of simple definite integrals. Definite integral as the limit of a sum. Area under plane curves – Area enclosed between two curves. Mean and RMS values of a function on a given interval Volumes of solids of revolution. Trapezoidal rule, Simpson's 1/3 rule to evaluate an approximate value of a definite integral.

Unit -III

Differential Equations:

3. Definition of a differential equation-order and degree of a differential equation- formation of differential equations-solutions of differential equations of first order and first degree using methods, variables separable, homogeneous, exact, linear differential equation, Bernoulli's equation.

Textbook:

Engineering Mathematics-II, a textbook for third semester diploma courses, prepared & prescribed by SBTET, AP.

Reference Books:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers.
2. Schaum's Outlines Differential Equations, Richard Bronson & Gabriel B. Costa
3. M.Vygodsky, Mathematical Handbook: Higher Mathematics, Mir Publishers, Moscow.

BLUE PRINT

R:

S. No	Chapter/ Unit title	No of Periods	Weighta ge allotted	Marks wise distribution of weightage				Question wise distribution of weightage				COs mappe d
				R	U	Ap	An	R	U	Ap	An	
1	Unit – I: Indefinite Integration	22	28	11	11	06	0	2	2	2	0	CO1
2	Unit – II: Definite Integration and its applications	24	33	11	03	11	08	2	1	2	1	CO2
3	Unit – III: Differential Equations of first order	14	19	03	03	03	10	1	1	1	1	CO3
Total		60	80	25	17	20	18	5	4	5	2	

Remembering Type : 25 Marks

U: understanding Type : 17 Marks

Ap: Application Type : 20 Marks

An: Analysing Type : 18 Marks

C-20

Engineering Mathematics – II

Unit Test Syllabus

Unit Test	Syllabus
Unit Test-I	From L.O 1.1 to L.O 2.5
Unit Test-II	From L.O 2.6 to L.O 3.9

UNIT TEST MODEL PAPERS

Unit Test I

C –20, AG-301

State Board of Technical Education and Training, A. P

First Year

Subject name: **Engineering Mathematics-II**

Sub Code: **AG-301**

Time : 90 minutes

Max.marks:40

Part-A

16Marks

Instructions: (1) Answer all questions.

(2) First question carries four marks and the remaining questions carry three marks each

1. Answer the following.

a. Evaluate $\int x^8 dx$ (CO1)

b. Evaluate $\int \frac{1}{\sqrt{4-x^2}} dx$. (CO1)

c. $\int e^x (f(x) + f'(x)) dx = e^x f(x) + c$ is true/false (CO1)

d. Evaluate $\int_0^{\frac{\pi}{2}} \cos x dx$ (CO2)

2. Evaluate $\int \left(3 \cos ec^2 x - 2 \tan x \sec x + \frac{1}{x} \right) dx$. (CO1)

3. Evaluate $\int \frac{\sin(\log x)}{x} dx$. (CO1)

4. Evaluate $\int e^x \sin 2x dx$. (CO1)

5. Evaluate $\int_0^{\frac{\pi}{2}} \sin^2 x dx$ (CO2)

Instructions: (1) Answer all questions.

(2) Each question carries eight marks

(3) Answer should be comprehensive and the criterion for valuation

is the content but not the length of the answer.

6. A) Evaluate $\int \frac{1}{5+4\cos x} dx$. (CO1)

or

B) Evaluate $\int \sin^4 x \cos^3 x dx$. (CO1)

7. A) Evaluate $\int \cos^{-1} \left(\frac{1-x^2}{1+x^2} \right) dx$. (CO1)

or

B) Evaluate $\int x^4 e^{2x} dx$. (CO1)

8. A) Evaluate $\int_0^{\frac{\pi}{2}} \cos 4x \cos x dx$

(CO2)

or

B) Evaluate $\int_0^{\frac{\pi}{2}} \frac{\sin^{10} x}{\sin^{10} x + \cos^{10} x} dx$ (CO2)

State Board of Technical Education and Training, A. P

First Year

Subject name: **Engineering Mathematics-II**Sub Code: **AG-301**

Time : 90 minutes

Max.marks:40

Part-A

16Marks

Instructions: (1) Answer all questions.

(2) First question carries four marks and the remaining questions carry three marks each

1. Answer the following.

a. Volume of the curve $y = f(x)$ over the interval $[a, b]$ when rotated about X-axis is _____
(CO2)b. Mean value of $f(x)$ over the interval $[a, b]$ is _____ (CO2)c. Order of differential equation $\frac{d^2y}{dx^2} + p^2y = 0$ is _____ (CO3)d. Integrating factor of $\frac{dy}{dx} + Py = Q$ is _____ (CO3)2. Find the mean value of $x^2 + 2x + 1$ over the interval $[1, 2]$ (CO2)3. Find the area enclosed by curve $x^2 = 4y$ between the lines $x = 2$ and $x = 4$ (CO2)4. Form the differential equation by eliminating the arbitrary constants from $y = A \cos 2x + B \sin 2x$.
(CO3)5. Solve $\frac{dy}{dx} = \sqrt{\frac{1-y^2}{1-x^2}}$. (CO3)

Part-B

3×8=24

Instructions: (1) Answer all questions.

(2) Each question carries eight marks

(3) Answer should be comprehensive and the criterion for valuation

is the content but not the length of the answer.

6. A) Find the area bounded between the curve $y = x^2 - 5x$ and the line $y = 4 - 2x$ (CO2)

Or

B) Find the R.M.S value of $\sqrt{\log x}$ between the lines $x = e$ to $x = e^2$ (CO2)

7. A) Find the volume of the solid obtained by revolving the ellipse $\frac{x^2}{16} + \frac{y^2}{25} = 1$ about x axis

(CO2)

or

B) Calculate the approximate value of $\int_0^6 \frac{1}{1+x} dx$ by taking $n = 6$ using Trapezoidal rule

(CO3)

8. A) Solve $(y^2 - 2xy)dx + (2xy + x^2)dy = 0$. (CO3)

or

B) Solve $x \frac{dy}{dx} + \frac{y}{x} = x^3 y^6$. (CO3)

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END EXAM MODEL PAPERS

STATE BOARD OF TECHNICAL EDUCATION, A.P

ENGINEERING MATHEMATICS AG- 301

TIME : 3 HOURS

MODEL PAPER- I

MAX.MARKS : 80M

PART-A

Answer All questions. Each question carries THREE marks. 10x3=30M

1. Evaluate $\int \left(2 \sin x - 3e^x + \frac{4}{1+x^2} \right) dx$. **CO 1**

2. Evaluate $\int e^x \sin e^x dx$. **CO 1**

3. Evaluate $\int \sin 3x \cos 2x dx$. **CO 1**

4. Evaluate $\int xe^x dx$. **CO1**

5. Evaluate $\int_0^1 \frac{1}{1+x^2} dx$. **CO 2**

6. Find the mean value of $y = x^2$ from $x=0$ to $x=1$ **CO 2**

7. Find the area of the region bounded by the curve $y = \sin x$ from $x=0$ to $x=\pi$
CO 2

8. Find the order and degree of the differential equation $\left(\frac{d^3y}{dx^3} \right)^2 - 3 \left(\frac{dy}{dx} \right)^2 - x^2 = 1$

CO3

9. Solve $\frac{dy}{dx} = \frac{1+y^2}{1+x^2}$ **CO3**

10. Solve $(x^2 + y)dx + (y^2 + x)dy = 0$. **CO3**

PART-B

Answer All questions. Each question carries EIGHT marks.

5x8=40M

11. A) Evaluate $\int \frac{3x+1}{(x-1)(x+3)} dx$. **CO1**

Or

B) Evaluate $\int \frac{1}{5+4\cos x} dx$. **CO1**

12. A) Evaluate $\int x \sin 3x \cos x dx$. **CO1**

Or

B) Evaluate $\int x^3 \cos x dx$. **CO1**

13. A) Evaluate $\int_0^1 \frac{x^3}{1+x^8} dx$. **CO2**

Or

B) Evaluate $\int_0^{\frac{\pi}{2}} \frac{1}{1+\tan^3 x} dx$. **CO2**

14. A) Find the area of the region bounded by the curves $y^2 = 4x$ and $x^2 = 4y$. **CO2**

Or

B) Find the R.M.S values of $\sqrt{27-4x^2}$ from $x=0$ to $x=3$ **CO2**

15. A) Find the volume of the solid generated by revolution of the ellipse $\frac{x^2}{16} + \frac{y^2}{25} = 1$

about X-axis

CO2

Or

B) Calculate the approximate value of $\int_1^{11} x^3 dx$ by using Simpson's 1/3rd rule by dividing the range into 10 equal parts. **CO2**

PART-C

Answer the following question. Question carries TEN marks.

1x10=10M

16. Solve $2 \sin x \frac{dy}{dx} - y \cos x = xy^3 e^x$. **CO3**

PART-A

Answer All questions. Each question carries THREE marks.

10x3=30M

1. Evaluate $\int \left(3e^x - 2\cos x + \frac{3}{x} \right) dx$. **CO 1**

2. Evaluate $\int \cos^2 2x dx$. **CO 1**

3. Evaluate $\int \frac{\tan^{-1} x}{1+x^2} dx$. **CO 1**

4. Evaluate $\int x \cos x dx$. **CO1**

5. Evaluate $\int_0^2 \frac{1}{\sqrt{4-x^2}} dx$. **CO2**

6. Find the mean value of $i = a \sin t$ over the complete wave. **CO2**

7. Find the volume generated by revolving the circle $x^2 + y^2 = 9$ from $x=0$ to $x=2$ about x-axis

CO2

8. Obtain the differential equation by eliminating the arbitrary constants A and B

from the curve $y = Ae^x + Be^{-x}$

CO3

9. Solve $\frac{dy}{dx} = e^{2x+y}$

CO3

10. Solve $\frac{dy}{dx} + \frac{y}{x} = x$ **CO3**

PART-B

Answer All questions. Each question carries EIGHT marks. 5x8=40M

11. A) Evaluate $\int \frac{1}{2x^2 + 3x + 5} dx$. **CO1**

Or

B) Evaluate $\int \sin^3 x \cos^5 x dx$. **CO1**

12. A) Evaluate $\int e^x \left(\frac{2 + \sin 2x}{1 + \cos 2x} \right) dx$. **CO1**

Or

B) Evaluate $\int e^{2x} x^4 dx$. **CO1**

13. A) Evaluate $\int_0^1 \frac{\sec^2 x}{(1 + \tan x)^2} dx$. **CO2**

Or

B) Evaluate $\int_0^{\frac{\pi}{2}} \log(1 + \tan \theta) d\theta$. **CO2**

14. A) Find the area bounded between the curves $y = x^2$ and the line $y = 3x + 4$. **CO3**

Or

B) Find the R.M.S value of $\sqrt{\log x}$ between the lines $x = e$ to $x = e^2$ **CO2**

15. A) Find the volume of right circular cone using integration. **CO2**

Or

B) Find the approximate value of π from $\int_0^1 \frac{1}{1+x^2} dx$ using Trapezoidal rule by dividing $[0,1]$ into 5 equal sub-intervals. **CO2**

PART-C

Answer the following question. Question carries TEN marks.

1x10=10M

16. Solve $xy^2 dy - (x^3 + y^3) dx = 0$ **CO3**

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-302	GRAPHIC DESIGNING	5	75	20	80

S.No.	Chapter/Unit Title	No.of Periods	CO's Mapped
1.	Photoshop Workspace and Work Flow	15	CO1
2.	Masking and Color Correction	15	CO2
3.	Illustrator user interface & Drawing Tools	15	CO3
4.	Designing Layout & printing process	15	CO4
5.	Designing for Media	15	CO5
Total Periods		75	

Course Objectives	<ul style="list-style-type: none"> • Understand the visual art and design • Expertise in typography , Page layout designing and Interface designing • Able to work with Logo designs, Coloring techniques and Advertisement designing • Capable of Working various designing software's • Able to handle publishing projects to design projects
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CO NO	COURSE OUTCOMES
CO1	AG-302.1 Use Photoshop Menus, shortcut keys, IDE environment and to work with various tools.
CO2	AG-302.2 Apply with colours and masking, layers, overlaying, images and sharpness along with applying filters and effects.
CO3	AG-302.3 Applying user interface & drawing tools and working images and symbols.
CO4	AG-302.4 Practice designing layouts and working with various printing processes.
CO5	AG-302.5 Develop Hard Print media documents such as newspapers, ads, banners etc..

COURSE OBJECTIVES

1.0 Photoshop Workspace and Work Flow

- 1.1. Define the terms Graphics, Photoshop
- 1.2. List elements of Photoshop Works pace
- 1.3. Describe the usage of panels and Menus.
- 1.4. List Tools and state their Uses
- 1.5. Explain the usage of Short Cut Keys
- 1.6. Explain the usage of Preset Manager
- 1.7. State the purpose of Ruler, Grid and Guides.
- 1.8. Changing Image Size and Resolution
- 1.9. Explain Creation, Opening and Importing of Images
- 1.10. Describe the Conversion of Images into Bitmap
- 1.11. Explain the Image Repair and Restoration
- 1.12. Describe Image Reshape and Transformation
- 1.13. State the purpose of Brushes and Patterns
- 1.14. List the Drawing Shapes and state their uses
- 1.15. Give the steps to practice Pen Tool
- 1.16. Explain the Painting

2.0 Masking and Color Correction

- 2.1. Define layer and state the uses
- 2.2. Describe the Operations on layers
 - 2.2.1. Selecting/un Selecting layers
 - 2.2.2. grouping/Un grouping layers
 - 2.2.3. Linking layers
 - 2.2.4. Moving layers
 - 2.2.5. Stacking layers
 - 2.2.6. Locking of Layers
 - 2.2.7. Masking/un masking of Layers

2.2.8.ClippingMasks

- 2.3. Explain Layer Effects and Styles
- 2.4. How to combine images with Auto-BlendedLayers
- 2.5. Write the steps to use overlaying images
- 2.6. Write the steps to use the Image Colour Corrections
- 2.7. State the purpose of Hue and Saturation
- 2.8. Describe the Exposure Blur and Sharpness
- 2.9. Define filter and list the types of filters
- 2.10. Write the steps to create montages
- 2.11. Explain the Saving feathered borders
- 2.12. Explain the Creating and saving paths
- 2.13. Write the steps to add and delete points
- 2.14. State the procedure to Converting selection to paths
- 2.15. Describe the Exporting paths to Quark
- 2.16. Introduction to Photoshop Filters-
- 2.17. State the Uses of filters in
 - 2.17.1. Blurring and sharpening
 - 2.17.2. Synthesizing texture
- 2.18. Creation of common file types
- 2.19. Write the steps for setting transparency
- 2.20. List types of Images for print
- 2.21. List types of Images for the web
- 2.22. State the Advantages of various formats
- 2.23. Write the steps to convert the image type
- 2.24. Explain the scanner type's controls

3.0 Illustrator the user interface & Drawing Tools:

- 3.1 Explain the Illustrator environment and Work area
- 3.2 Explain setting up a page
- 3.3 Explain viewing the document and working in artwork or preview modes
- 3.4 State the use of Grids, guides and objects

3.5 Explain following Guides operations

3.5.1 Adding and Deleting

3.5.2 Locking and Unlocking

3.5.3 Positioning

3.6. Practice to Draw and modify various basic shapes

3.7. Explain usage of pen and pencil tools

3.8. Explain following

3.8.1. Creation of path

3.8.2. Combining paths

3.8.3. Grouping paths

3.8.4. Applying SplineCurves

3.8.5. Compound Path

3.9. Apply Stroke and Fill colours

3.10. List types and state the uses of Paintbrushes

3.11. Write steps to Set up Text Attributes

3.12. Explain the Wrapping Paragraph and Character Styles

3.13. State steps to Use an illustrator Path to Mask

3.14. Give Steps to Creation of Custom Symbols Using Symbol Tools

3.15. Explain the process of Accessing Symbol Libraries

3.16. Describe the Manipulating and Duplicating Symbols

3.17. Give steps to Replacing All Instances of a Symbol

3.18. State the steps to Saving Default Symbols

3.19. Describe the 3D Effects and Visualizing

3.20. State use of the Opacity Masks

3.21. Explain the Clipping Masks

3.22. Explain the Graphic Styles Exporting Artwork

4.0. Designing Layout & printing process

4.1. State the terms designing and creativity

4.2. List the Steps in Designing

4.3. List the Steps in Creativity

- 4.4. Define the term Typography
- 4.5. List and Explain the Visual Ingredients of Graphic Design
- 4.6. List various Design Considerations
- 4.7. State Purpose and list Advantages of SymbolsLayout

- 4.8. State Purpose and list Advantages of Logos Layout
- 4.9. Describe the Layout Styles and Layout Components
- 4.10. Stages in Preparing a Layout
 - 4.10.1. Marking-Up;
 - 4.10.2. Dummy
 - 4.10.3. Explain any Case Study.
- 4.11. Define printing
- 4.12. Explain the process of printing design
- 4.13. List Types of Printing Processes
- 4.14. Explain the process of Printing in Letterpress
- 4.15. Explain the process of Printing in Offset
- 4.16. Explain the process of Printing in Gravure
- 4.17. Explain the process of Printing in Flexography
- 4.18. Explain the process of Printing in Screen Printing
- 4.19. ExplainNon-impact Printing
- 4.20. Give the Steps to Image Carrier Preparation For Different Types Of Printing Process

5.0 Designing for Media

- 5.1. Explain the process of Designing Newspapers
- 5.2. Describe the process of Designing Bookletswith an Example
- 5.3. Explain the process of Designing Magazines
- 5.4. Demonstrate the process of Designing Business Publications
- 5.5. Explain the process of Designing Banners& Posters
- 5.6. Describe the process of Designing Advertisement

- 5.7. Demonstrate the process of Designing Pamphlets (like polycet campaign)
- 5.8. Explain the process of Designing Transit
- 5.9. Explain the process of Designing Interactive Web and Maps
- 5.10. Explain Relationship between designer, customer and printer
- 5.11. Explain Selection and co-Ordination of Production Process
- 5.12. List the Limitations of Printing Process
- 5.13. Explain the process of Binding and finishing

COURSE CONTENT

1. Photoshop Workspace and Work Flow

Basics of Works pace– Panels and Menus - Tools and Uses – Short Cut Keys – Preset Manager – Ruler – Grid and Guides – Image Size and Resolution – Creation, Opening and Importing of Images - Conversion of Images into Bitmap – Repair and Restoration – Reshape and Transformation – Brushes and Patterns – DrawingShapes – Pen Tool and their Uses – Painting

2. Masking and Color Correction

Basics of Layers – ManagingSelecting, grouping, Linking, Moving, Stacking and Locking of Layers – Masking of Layers and Editing – LayerswithClipping Masks – Layer Effects and Styles – Combining images with Auto-BlendedLayers – Overlayingimages –Image Colour Corrections - Hue and Saturation – Exposure Blur and Sharpness

Filters and Effects: Creating montages-Savingfeatheredborders – Creating and savingpaths – Adding and deleting points-Convertingselction to paths – Exportingpaths to Quark – Introduction to Photoshop Filters-Tips on usingfilters-Blurring and sharpening –Synthesizing texture- Creatingcommon file types – Setting transparency – Images for print-Images for the web – Advantages of various formats – Converting the image type – Overview of scanner types controls

3. Illustrator user interface &Drawing Tools:

Illustrator environment and Work area –Page setup – Viewing the document and working in artwork or preview modes – Grids, guides, objects
 – Adding and using guidelines - locking and unlocking, positioning – Drawing and modifying basic shapes –Using the pen and pencil tools – to create paths- Combining, Grouping – SplineCurves – Compound Path – Applying Stroke and Fill colours - Filling –Using paintbrushes

Working With Images &Symbols: SettingText Attributes – WrappingParagraph and Character Styles – Using an illustrator Path to Mask - Creation of Custom SymbolsUsing Symbol Tools
 - Accessing Symbol Libraries-Manipulating and Duplicating Symbols - Replacing All Instances of a Symbol - Saving Default Symbols - 3D Effects and Visualizing - Opacity Masks - Clipping Masks - Graphic Styles Exporting Artwork

4. Designing Layout & printing process

Basic Concepts Of Designing, Creativity, Steps In Creativity; Typography; Visual Ingredients Of Graphic Design; Design Consideration; Symbols And Logos Layout – Purpose & Advantages; Layout Styles; Layout Components; Stages In Preparing A Layout; Marking-Up; Dummy, Case Studies.

Printing process: Types Of Process – Letterpress, Offset, Gravure, Flexography, Screen Printing And Nonimpact Printing Processes; Introduction To Image Carrier Preparation For Different Types Of Printing Process

5. Designing for Media

5.1 Designing for Newspapers, Booklets, Magazines, and Business Publications, Banners & Posters, Advertising, Pamphlets, Transit, Interactive, Web and Maps. Case Studies. Design management & production planning: Relationship between designer, customer and printer; selection and co-Ordination of Production Process; Limitation of Printing Process, Binding, finishing

CO-PO/PSO MATRIX

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
AG-302.1	1	1	1	1	1		2	1	3	
AG-302.2	2	2	2	1	1	2	2	1	3	
AG-302.3	2	3	3	1	3	2	3	1	3	3
AG-302.4	2	3	2	1	1	2	3	1	3	3
AG-302.5	2	3	2	1	3		3	1	3	3
Average	1.8	2.4	2	1	1.8	2	2.6	1	3	3

3=strongly mapped, 2=moderately mapped, 1=slightly mapped

REFERENCE BOOKS:

1. Adobe Photoshop cs4 or higher, by Jennifer smith, Focal press, 2010 second edition
2. Photoshop bible cs5, by Brad dayley, Oriley publication, 2011 first Edition or latter.
3. Photoshop cs5 illustrator, by Chirsbotello, Delmar learine, 2010 Second Edition or higherversions

Model Blue print

S.No	Chapter/Unit title	No.of periods	Weightage Allocated	Marks Wise Distribution of Weightage				Question wise Distribution of Weightage				CO's Mapped
				R	U	A p	A n	R	U	A p	A n	
1	Photoshop Workspace and Work Flow	15	14	3	11			1	2			CO1
2	Masking and Color Correction	15	14	3	3	8	10	1	1	1	*	CO2
3	Illustrator user interface & Drawing Tools	15	14	3	3	8	10	1	1	1	*	CO3
4	Designing Layout & printing process	15	14	3	3	8	10	1	1	1	*	CO4
5	Designing for Media	15	14	3	3	8	10	2	1		*	CO5
	Total	75	70 + 10(*)					6	6	3	1	

Note: Part-C: 10 marks single analytical question may be chosen from any or combination of starred chapters

Table specifying the scope of syllabus to be covered for unit tests

Unit Test	Learning outcomes to be covered
Unit test-1	From 1.1 to 3.11
Unit test-2	From 3.12 to 5.13

DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
MODEL PAPER
GRAPHIC DESIGNING
UNIT TEST-1

SCHEME: C-20SUBJ CODE: AG-302

MAX MARKS: 40

TIME: 90Minutes

PART-A

16Marks

Instructions: 1) Answer all questions

2) First question carries 4marks, and each question of remaining carries 3marks.

1. a)Photoshop is also called ----- (CO1)
- b)Background layer present in the Photoshop (True/False) (CO2)
- c) shortcut for Create new layer() (CO2)
- 1) Ctrl-Shift-O 2) Ctrl-Shift-N3) Ctrl-Shift-P 4) Ctrl-Shift-M
- d) Show/Hide Brushes panel(CO3)
1)F5 2)F6 c)F7 4)F9
- 2)Define the terms Graphics and Photoshop (CO1)
- 3)Define layer and state the uses (CO2)
- 4) List Steps to Apply Stroke and Fill colours (CO3)
- 5)Define filter and list the types of filters (CO2)

PART-B

3X8=24Marks

Instructions:1) Answer all questions

2) Each question carries 8 Marks

3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

6. a)Explain various panels and Menus (CO1)
- Or
- b) Explain Creation, Opening and Importing of Images (CO1)

7. a) Explain Layer Effects and Styles (CO2)
- Or
- b) Explain the scanner type's controls (CO2)
8. a) Explain viewing the document and working in artwork or Preview modes (CO3)
- Or
- b) . Explain usage of pen and pencil tools (CO3)

**BOARD DIPLOMA EXAMINATIONS
DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
MODEL PAPER – YEAR END EXAMINATION
GRAPHIC DESIGNING
SCHEME: C-20SUBJ CODE: AG-302**

MAX MARKS:80

TIME: 3HOURS

PART-A

10X3=30Marks

Note: Answer all questions

1. Define the terms Graphics, Photoshop (CO1)
2. List elements of Photoshop Works pace (CO1)
3. Define layer and state the uses (CO2)
4. List types of Images for print (CO2)
5. List types and state the uses of Paintbrushes (CO3)
6. State use of the Opacity Masks (CO3)
7. Define the term Typography (CO4)
8. Define printing (CO4)
9. List the Limitations of Printing Process (CO5)
10. Define term a) poster b) binding (CO5)

PART-B

5x8=40Marks

Note: Answer all questions

11. A.Explain various panels and Menus (CO1)

OR

11. B.Explain Creation, Opening and Importing of Images (CO1)

12. A.Explain Layer Effects and Styles (CO2)

OR

12.B.Explain following operation layers

a)Linking b) Moving c) Stacking d) Locking (CO2)

13. A.Explain the Wrapping Paragraph and Character Styles (CO3)

OR

13.B.. Explain a) Creation of path b) Combining paths (CO3)

14A.List and Explain the Visual Ingredients of Graphic Design (CO4)

OR

14. B. Describe the Layout Styles and Layout Components (CO4)

15. A.Explain the process of Designing Magazines (CO5)

OR

15. B. Explain the process of Binding and finishing (CO5)

PART-C

1X10=10Marks

16. Give the Step by step process to Design Polycet campaign banner with at least 3 lines of information with at least two images applying different Colours and sizes

(CO5)

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-303	Elements of Film Technology	5	75	20	80

S.No.	Chapter/Unit Title	No.of Periods	CO's Mapped
1.	VISUAL COMMUNICATION	15	CO1
2.	PRE SHOOTING	15	CO2
3.	PRODUCTION DESGIN	15	CO3
4.	SHOOTING	15	CO4
5.	POSTO SHOOTING	15	CO5
Total Periods		75	

Course Objectives	<ul style="list-style-type: none"> • Understand the film history , • Apply Script writing techniques and story writing techniques • Able to make documentary films and short films • Able To Handle Production Unit • Expert in handling cameras & techniques and to play role of director.
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CO NO	COURSE OUTCOMES
CO1	AG-303.1 Use various types of visual communication techniques and methods.
CO2	AG-303.2 Describe pre-shooting activities
CO3	AG-303.3 Apply the production design methodologies
CO4	AG-303.4 Apply the activities of shooting process
CO5	AG-303.5 Apply Post shooting activities.

CO-PO/PSO MATRIX

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
AG-303.1	1	2	2	1	2	1	2	1	2	2
AG-303.2	2	2	2	2	3	3	2	2	3	2
AG-303.3	2	3	3	3	3	2	2	2	3	3
AG-303.4	2	3	3	3	3	2	3	1	3	3
AG-303.5	2	3	3	3	3	3	3	2	3	3
Average	1.8	2.6	2.6	2.4	2.8	2.2	2.4	1.6	2.8	2.6

3=Strongly mapped , 2=moderately mapped, 1=slightly mapped

Learning Outcomes:

1. VISUAL COMMUNICATION

- 1.1. Define communication.
- 1.2. State the importance of human and visual communication.
- 1.3. Explain basics of communication.
- 1.4. List functions of communication.
- 1.5. Explain functions of communication.
- 1.6. List types of Communication.
- 1.7. Explain types of Communication.
- 1.8. Define the term visual communication.
- 1.9. Describe verbal communication.
- 1.10. Explain nonverbal communication.
- 1.11. Explain inter personal relationships.
- 1.12. What is mass communication.
- 1.13. Describe mass communication.
- 1.14. State the importance of Group communication.
- 1.15. Explain group communication.
- 1.16. Explain visual communications.
- 1.17. List visual vocabulary.
- 1.18. Explain visual vocabulary.

2. Pre Shooting.

- 2.1. Define script
- 2.2. List the characters of a good script.
- 2.3. List and explain the elements of a script.
- 2.4. Write a sample script.
- 2.5. What is script analysis.
- 2.6. Explain the process of script analysis.
- 2.7. Classify the genre of the film.
- 2.8. Explain various genre of film.
- 2.9. Explain social or fantasy genre of film.
- 2.10. Explain the process of generating
- 2.11. Explain the process of assessing the characters based on profession and backgrounds.

- 2.12. Explain the process of assessing the characters based on jeweler.
- 2.13. Explain the process of assessing the characters based on costumes.
- 2.14. Explain the process of assessing the characters based on transportation system.
- 2.15. Explain the history (research) of assessing characters based on profession and background.
- 2.16. Explain the history (research) of assessing characters based on jewels.
- 2.17. Explain the history (research) of assessing characters based on costumes.
- 2.18. Explain the history (research) of assessing characters based on transportation Systems.
- 2.19. Explain the importance of visiting Museums, Libraries in pre-shooting.
- 2.20. Explain the importance of Internet, old maps and films in pre shooting.
- 2.21. Describe the channelizing the findings of visiting Museums, Libraries, Internet, old maps and films.
- 2.22. Explain the concept of collection of materials.
- 2.23. Define the term anachronism and artifact.
- 2.24. Explain the process of avoiding anachronisms Important to discard artifacts non – pertaining to the periods and genre of the film
- 2.25. Explain the process of assisting the director to finalize casting.

3. PRODUCTION DESGIN:

- 3.1. Define the term location.
- 3.2. List types of locations.
- 3.3. State the purpose of location.
- 3.4. What is location hunting.
- 3.5. State the need of location hunting.
- 3.6. State the roles of Film Director.
- 3.7. State the roles of cinematographer.
- 3.8. Explain Location hunting process with Director and cinematographer.
- 3.9. Describe the Identification of location suitable to provide backdrop on the scenes .
- 3.10. Define the terms Set and set erection.
- 3.11. State the need of set erection.
- 3.12. Describe the process of Erection of sets.
- 3.13. Describe the process of surrealistic and dreamy sets for song sequences
- 3.14. Define the terms Sketch and diagram.
- 3.15. State the need of sketch.
- 3.16. State the need of Diagram.
- 3.17. Describe the preparations of sketches and diagrams.
- 3.18. Define the terms color and tone of the film.
- 3.19. Determining the color and tone of the film.
- 3.20. Explain selection of properties in accordance with the tone and color of the films

- 3.21. Define the Film Budget.
- 3.22. State the purpose of the Film Budget.
- 3.23. Explain Estimating the budget.

4. SHOOTING:

- 4.1. Define term Shooting.
- 4.2. Define the terms Backdrop.
- 4.4. List the properties of backdrop and scenes.
- 4.5. Explain Providing Backdrops and properties which enhance the mood of the scene to be shot
- 4.6. List narrative strategies.
- 4.7. Explain narrative strategies.
- 4.8. What is location scouting.
- 4.9. Explain the location scouting
- 4.10. Define the term casting actor.
- 4.11. Describe role of casting actors .
- 4.12. Define the term Motivating actor.
- 4.13. Describe the role of motivating actors.
- 4.14. Describe the process of getting the performance from actors.
- 4.15. How to use .cinematographer as Director's eye.
- 4.15. State the purpose of the dynamization of space and time .
- 4.16.Explain the process of dynamization of space and time.
- 4.19. List and explain various kinds of continuity.
- 4.20. Define the term shot.
- 4.21.Determining the field of each shot and creativity.
- 4.22.List latest technologies with regard to Graphics, Animation and special Effects.
- 4.24. Explain Blue/Green mat shooting.
- 4.25. State the purpose of miniature.
- 4.25. Explain the Preparationof miniatures.
- 4.26. State the purpose of plaster casts.
- 4.27. Explain the preparation of plaster casts.
- 4.28. State the purpose of clay models.
- 4.29. Explain the process of preparation of clay models.

5. POST SHOOTING:

- 5.1. List the members of Post production team.
- 5.2.Explain the job roles of Post Production Team members.
- 5.3.LIST THE STAGES OF Post production.
- 5.4.Define Editing.

- 5.5.Explain the process of Editing.
- 5.6.Define Dubbing.
- 5.7.Explain the process of Dubbing.
- 5.8.Define Re-Recording.
- 5.9.Explain the process of Re-recording.
- 5.10. Define Mixing.
- 5.11. Explain the process of imposing Sound and Special effects.
- 5.12. Explain the process of Mixing.
- 5.13. What is First copy and how to release First copy.
- 5.14. What is the role of Censorship body.
- 5.15. Explain the roles and responsibilities of Censorship .
- 5.16. Explain the tasks involved in making Release arrangements.
- 5.17. State the importance of maintaining relationship with media.
- 5.18. Explain the process of Maintaining relationship with media .
- 5.19. Define the terms publicity and promotion.
- 5.20. Explain the process of Publicity and promotion.

COURSE CONTENT

1. VISUAL COMMUNICATION : Basics of communication - functions and types of communication – verbal communication – nonverbal communication – Interpersonal relationships – Mass communication – Group communication – Visual communications– Visual vocabulary
2. PRE SHOOTING: Script analysis – Categorizing the genre of the film, social or fantasy – assessing the characters, their profession and backgrounds, jewelry, costumes, Transportation systems etc. – Research based on the above – visiting Museums, Libraries, Internet, old maps and films – Channelize the findings – collection of materials – Avoiding Anachronisms: Important to discard artifacts non – pertaining to the periods and genre of the film. Assisting the Director to finalize casting
3. PRODUCTION DESIGN: Location hunting with Director and cinematographer – Identification of location suitable to provide backdrop on the scenes – Erection of sets wherever required – surrealistic and dreamy sets for song sequences – preparations of sketches and diagrams – Determining the color and tone of the film – selection of properties in accordance with the tone and color of the films – Estimating the budget.

4. SHOOTING: Providing Backdrops and properties which enhance the mood of the scene to be shot – Narrative strategies – location scouting – casting actors – motivating actors – getting the performance – cinematographer as Director’s eye –dynamisation of space and time – various kinds of continuity– Determining the field of each shot and creatively.– Knowledge of latest technology with regard to Graphics, Animation and special Effects – Blue/Green mat shooting – Preparationof miniatures, plaster casts, clay models
5. POST SHOOTING: Editing, Dubbing, Re-recording, Sound, Special effects, Mixing etc. – First copy – Censorship – Release arrangements. Relationship with media – Publicity and promotion

Reference Books:

1. Directing Film techniques and Aesthetics, by Michael Rabiger, - Big picture media, 2010 5th edition
2. Shot By Shot, by Steven D.Katz, Columbia university press, 2006 3rd edition
3. Film Language, by Christian Metz , Chaplin book publishers 2002 2nd edition

Model Blue Print.

S.No.	Chapter/Unit title	No.of periods	Weightage Allocated	Marks Wise Distribution of Weightage				Question wise Distribution of Weightage				CO's Mapped
				R	U	A p	An	R	U	Ap	An	
1	VISUAL COMMUNICATION	15	14	3	11			1	2			CO1
2	PRE SHOOTING	15	14	3	3	8	10	1	1	1	*	CO2
3	PRODUCTI ON DESGIN	15	14	3	3	8		1	1	1	*	CO3
4	SHOOTING	15	14	3	11		10	1	2	1	*	CO1
5	POSTO SHOOTING	15	14	6	8		10	2	1	1	*	CO5
	Total	75	70 + 10(*)					6	7	4		

Note: Part-C: 10 marks single analytical question may be chosen from any or combination of starred chapters

Table specifying the scope of syllabus to be covered for unit tests

Unit Test	Learning outcomes to be covered
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Unit test-1	From 1.1 to 3.12
Unit test-2	From 3.13 to 5.14

DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
MODEL PAPER
Elements of Film Technology
UNIT TEST-1
SCHEME: C-20 SUBJ CODE:AG-303

MAX MARKS:40

TIME: 90Minutes

PART-A

16Marks

- Instructions: 1) Answer all questions
2) First question carries 4marks, and each question of remaining carries 3marks.

- 1.a) **Communication** is simply the act of transferring information from one place, person or group to another. (True/False) (CO1)
- b) The person who act as creative lead of the **film is called as** _____. (CO3)
- c) Step by step procedure to solve problem is ----- (CO2)
- d) Which one of the following is not a Script Element. [] (CO2)
- a) Scene heading b) action c) dialogue d) singing
- 2) List any three types of Communication (CO1)
- 3) What is script analysis. (CO2)
- 4) List any three genre of the film.? (CO2)

5) Write about Location Hunting process.. (CO3)

PART-B

3X8=24Marks

Instructions: 1) Answer all questions

2) Each question carries 8 Marks

3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

6. a) Explain nonverbal Communication. (CO1)

Or

b) Explain Mass communication. (CO1)

7. a) Explain the process of assessing the characters based on profession and backgrounds. (CO2)

Or

b) Explain the process of assisting the director to finalize casting. (CO2)

8. a) Describe the Identification of location suitable to provide backdrop on the scenes (CO3)

Or

b) Describe the process of surrealistic and dreamy sets for song sequences (CO3)

BOARD DIPLOMA EXAMINATIONS
DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
MODEL PAPER – YEAR END EXAMINATION
ELEMENTS OF FILM TECHNOLOGY
SCHEME: C-20 SUBJ CODE:AG-303

MAX MARKS:80

TIME: 3HOURS

PART-A

10X3=30Marks

Note: Answer all questions

1. What is communication. (CO1)

2. List any three functions of communication. (CO1)

3. Define Script. (CO2)

4. List various genre of the film. (CO2)

5. Define the terms sketch and diagram. (CO3)

6. State the purpose of film budget. (CO3)

7. What is backdrop? (CO4)

8. State the purpose of Miniature. (CO4)
9. Define Editing. (CO5)
10. What is the role of Censorship body. (CO5)

PART-B

5x8=40Marks

Note: Answer all questions

11. A.Explain interpersonal relationships. (CO1)

OR

- 11.B Explain about Group Communication. (CO1)

- 12.A.Explain the process of script analysis. (CO2)

OR

- 12.B. Explain the process of assessing the characters based on profession and backgrounds. (CO2)

- 13.A.Explain Location hunting process with Director and cinematographer.. (CO3)

OR

- 13.B. Explain selection of properties in accordance with the tone and color of the films (CO3)

- 14.A.Explain Providing Backdrops and properties which enhance the mood of the scene to be shot (CO4)

OR

- 14.B. Explain Blue/Green mat shooting. (CO4)

15.A. Explain the process of Editing..

(CO5)

OR

15.B.Explain the process of imposing Sound and Special effects. (CO5)

PART-C

1X10=10Marks

16. Explain how to provide publicity and promotion to the short film created by you on traditional marriages in India. (CO2)

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-304	2D DigitalAnimation	5	75	20	80

S.No.	Chapter/Unit Title	No.of Periods	CO's Mapped
1.	FLASH INTRODUCTION	20	CO1
2.	DIGITAL CONVERSION	10	CO1,CO2
3.	INTRODUCTION TOANIMATION	15	CO1,CO2,CO3
4.	FLASH APPLICATIONS	15	CO1,CO2,CO3,CO4
5.	CHARACTER ANIMATION	15	CO1,CO2,CO3,CO4,CO5
Total Periods		75	

Course Objectives	<ul style="list-style-type: none"> • describe the work flow of digital 2d animation • Handling various 2d software's like Flash with animation principles and color theory • Creating Background & layout • Handling scanning & processing along with Character design • Working with key roles of 2-D animation, composing and debugging • Describe animatingusing various characters designs
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CO NO	COURSE OUTCOMES
CO1	AG-304.1 Explain IDE and tools of Flash and to work with color styles and drawing modes.
CO2	AG-304.2 Creating characters by applying various backgrounds and sequences
CO3	AG-304.3 Demonstrate timeline aspects , key frAGes and motions in producing animations.
CO4	AG-304.4 Applying Symbols and animation effects
CO5	AG-304.5 Animating various characters and exporting images and videos.

CO-PO/PSO MATRIX

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	2	2			1	2	3	1
CO2	2		3	2				3	2	
CO3	2		2	2				3	3	
CO4		3	2	2	2	2	3	3	3	3
CO5		2	3	2	2		3	3		3
AVERAGE	2	2.3	2.4	2	2	2	2.3	2.8	2.75	2.3

3=Strongly mapped , 2=moderately mapped, 1=slightly mapped

Learning Outcomes

1.0 Flash Introduction

- 1.1 Introduction to Flash
- 1.2 Explain the components of IDE
- 1.3 Describe flash workspace
- 1.4 State the usage of Tools panel
 - 1.4.1 selection (move),
 - 1.4.2 free transform (scale, rotate),
 - 1.4.3 line,
 - 1.4.4 lasso,
 - 1.4.5 magic wand,
 - 1.4.6 shape,
 - 1.4.7 fill,
 - 1.4.8 gradient,
 - 1.4.9 erase,
 - 1.4.10 pencil,
 - 1.4.11 pen,
 - 1.4.12 brush and more.
- 1.5 Quote shortcut keys to select or perform various actions of tools
- 1.6 working with objects
 - 1.6.1 creating objects
 - 1.6.2 Modifying objects
 - 1.6.3 Moving objects
- 1.7 Explain the importance of flash timeline and its effects
- 1.8 Describe the features of timeline.
- 1.9 Describe library and its features
- 1.10 Discuss the uses and importance of color palette
- 1.11 Discuss about color mixing and its uses
- 1.12 Explain different solid colors
- 1.13 Explain menus
- 1.14 Explain the process of tracing an object
- 1.15 List various drawing modes
- 1.16 Explain drawing modes
- 1.17 Define color gradients or *color* transitions
- 1.18 Discuss about Gradient adjustment
- 1.19 Discuss about bitmap images .
- 1.20 Discus about creation of bitmap files.
- 1.21 Discuss the steps to create pattern
- 1.22 Describe the flash document settings.

2.0 Digital Conversion

- 2.1 Describe the terms scanning, import, import as sequence, cleanup, Quick Trace
- 2.2 Explain the usage of brush too with its properties - smooth, shape, size and color
- 2.3 Explain the usage of Paint Bucket tool with properties - stroke, style, scale, width and drag fill
- 2.4 Describe paint bucket cut-color
- 2.5 Explain the steps to create realistic effects.
- 2.6 Explain the process of adding lights and shadows to the scene.

- 2.7 Describe character designing and character build
- 2.8 Explain the process of creating background
- 2.9 Explain the process of creating environment lighting
- 2.10 Differentiate between grid and guide.
- 2.11 Define Perspective Grid and
- 2.12 Explain the steps to add perspective grids in flash animation file

3.0 Introduction to Animation

- 3.1 List the properties of timeline
- 3.2 Explain properties of timeline
- 3.3 List timeline menus.
- 3.4 Explain timeline menus.
- 3.5 Define the terms frame, key-frame, blank key frame and differentiate between them
- 3.6 Write the steps to insert key frame or blank key frame
- 3.7 Discuss about motion tween, shape motion Tween and differentiate
- 3.8 Describe layer with its importance
- 3.9 State the purpose of motion guide layer
- 3.10 Write the procedure to copy frame and motion
- 3.11 Describe how to do image scaling and squeezing in Flash.
- 3.12 Describe clip animation
- 3.13 Describe frame-by-frame animation
- 3.14 Write the procedure to create frame by frame animation (5)
- 3.15 Describe tweening animation
- 3.16 Write the procedure to create tween based animation
- 3.17 Explain different editing modes
- 3.18 Describe primary and secondary action
- 3.19 Explain 12 principles of animation.

4.0 Flash Applications

- 4.1 Define symbol in flash
- 4.2 List various symbols
- 4.3 Differentiate among symbols
- 4.4 Explain different symbols and differentiate
- 4.5 Explain the procedure to edit a symbol in symbol-editing mode.
- 4.6 Write the steps to create graphic symbol in flash
- 4.7 Write the steps to create movie clip symbol in flash
- 4.8 Write the steps to create button symbol in flash
- 4.9 Write the steps to modify already existing symbol
- 4.10 Explain the steps to duplicate symbol
- 4.11 Explain the steps to swap symbol
- 4.12 Write the procedure to create symbol based animation
- 4.13 Describe the concept of creating multiple actions
- 4.14 List the effects that can be added to timeline and explain them
- 4.15 Explain the procedure to create timeline effects- Blur Effect, Transition Effect, Drop Shadow Effect, Expand Effect, Transform Effect, Drop Shadow Effect, Explode Effect
- 4.16 Explain the procedure to create timeline fade on and fade out effects

5.0 Character Animation

- 5.1 Describe the concept of character design
- 5.2 State the importance of character design
 - 5.3 Write the steps to build a character
 - 5.4 Explain the procedure to separate elements of a built character..
 - 5.5 Explain the steps for adding poses in symbols
 - 5.6 Describe the concept of rigging
 - 5.7 Differentiate between rigging and animation.
 - 5.8 Explain the procedure to apply character rigging constraints
 - 5.8.1 Joints
 - 5.8.2 Apply Constrains
 - 5.8.3 Shape hints
 - 5.8.4 Ease In
 - 5.8.5 Ease Out
 - 5.8.6 Walk
 - 5.8.7 Run
 - 5.8.8 Jump
 - 5.8.9 Push
 - 5.8.10 Pull
 - 5.8.11 Loop Action
 - 5.8.12 Play Once
 - 5.8.13 Select Frame
 - 5.8.14 Facial Expressions
 - 5.8.15 Eye Blink
 - 5.8.16 Dialogue
 - 5.8.17 Audio sync
 - 5.9 Explain the process of exporting image and video
 - 5.10 Explain the process of exporting video as sequence of image
 - 5.11 Explain the process of exporting settings
 - 5.12 Explain the steps to take output in flash

COURSE CONTENT

1. Flash Introduction

Introduction- IDE- Tools Panel – Uses of Tool and Properties - working with Objects — Timeline – Library – Color mixing– Different solid Colors– Menus –Object tracing -Drawing mode – Gradient adjustment – Bitmap – Pattern Creation – Document settings

2. Digital Conversion

Scanning – Import – Import as Sequence – Clean up – Quick Trace – Brush tool Properties – Smooth – Shape – Size – Color apply – Paint Bucket Properties – Cut Color – Realistic – Light and Shade – Character designing – Character Build – Back ground Creation – Environment Lighting – Perspective – Grid – Guide

3. Introduction to Animation

Time line Properties – Timeline Menus – Key frame – Insert Key frame – Blank Key Frame – Create Motion Tween – Shape Motion Tween –layer- Motion Guide Layer – Copy Frame and Motion – Clip Animation – Frame by frame animation – Different Edit Modes –primary and secondary avtions-12 principles of animation-

4. Flash Applications

Symbols Introduction – Types of symbols – Symbol Edit Mode – Create symbol – Re Modified Symbol – Duplicate Symbol – Swap Symbol – Symbol Based Animation – Create Multiple Action – Adding Effects to Time line – Transition – Blur – Glow – Fade On – FadeOut

5. Character Animation

Character Design – Character Build – Separate Elements - Adding Poses in Symbol – Rigging – Apply Joints – Apply Constrains – Shape hints – Ease In – Ease Out – Walk – Run – Jump – Push – Pull – Loop Action – Play Once – Select Frame – Facial Expressions – Eye Blink – Dialogue – Audio sync – Export as Image and Video – Export as Sequence – Export Settings – Take Output

REFERENCE BOOKS

1. Adobe flash professional cc class room book, by Adobe creative team, Adobe press, 2013 - First Edition
2. Adobe flash professional, by Adobe creative team, Adobe press, 2012 - First Edition
3. Action script 3.0 adobe cs5 pro, by Adobe creative team, Adobe press, 2010 - First Edition

Blue print

S.No.	Chapter/Unit title	No.of periods	Weightage Allocated	Marks Wise Distribution of Weightage				Question wise Distribution of Weightage				CO's Mapped
				R	U	Ap	An	R	U	Ap	An	
1	FLASH INTRODUCTION	20	17	11	6			2	2			CO1
2	DIGITAL CONVERSION	10	11	3	8			1	1		*	CO1,CO2
3	INTRODUCTION TOANIMATION	15	14		3	11	10		1	2	*	CO1,CO2,CO3
4	FLASH APPLICATIONS	15	14		11	3	10		2	1	*	CO1,CO2,CO3,CO4
5	CHARACTER ANIMATION	15	14		6	8	10		2	1	*	CO1,CO2,CO3,CO4,CO5
	Total *	75	70 +10*	14	34	22	*10	4	7	4	1	

Note: Part-C: 10 marks single analytical question may be chosen from any or combination of starred chapters

Table specifying the scope of syllabus to be covered for unit tests

Unit Test	Learning outcomes to be covered
Unit test-1	From 1.1 to 3.9
Unit test-2	From 3.10 to 5.12

DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
MODEL PAPER
2D DIGITAL ANIMATION
UNIT TEST-1

SCHEME: C-20
MAX MARKS:40

SUBJ CODE:AG-304
TIME: 90Minutes

PART-A

16Marks

Instructions:1) Answer all questions

2) First question carries 4marks, and each question of remaining carries 3marks

1. CO1
- A. **Lasso tool** too is useful for drawing freeform segments of a **selection** border.
- B. JPG stands for
- a) Joint Photographic Experts Group b) Joint Photographic Group
c) Joint Photo Graph c) Joint Photo Group
- C. This area in Flash is similar to the clipboard in Microsoft Office applications.
- a) Dashboard b) Layers Panel
c) Library Panel d) Property Inspector
- D. These are frames that are significant. It is the basis for tweened animation.
- a) Keyframes b) Special Frames
c) Master Frame None of the above
2. State the usage of Tools menu CO1
3. Differentiate between GRID and GUIDE CO1
4. List various Drawing modes CO2
5. State the purpose of motion guide layer CO2

PART-B

3X8=24Marks

Instructions: 1) Answer all questions

2)Each question carries 8 Marks

3)Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer

6. Explain the process to create pattern in flash CO5
Or
Explain the gradient tool with its types CO2

7. Explain purpose of paint bucket with its options(Gap size option, Lock fill option, & Transform Fill option) CO3

Or

What are the benefits of layers in flash? Explain in detail. CO4

8. Discuss the difference between shape tweening and motion tweening? CO5

Or

Describe how to do image scaling and squeezing in Flash.

BOARD DIPLOMA EXAMINATIONS
DIPLOMA IN ANIMATION AND MULTIMEDIA ENGINEERING
MODEL PAPER – YEAR END EXAMINATION
2D DIGITAL ANIMATION

SCHEME: C-20
MAX MARKS:80

SUBJ CODE:AG-304
TIME: 3 HOURS

PART-A

Note: Answer all questions. Each question carries 3 marks

10 X 3=30M

- | | | | |
|----|---|---|-----|
| 1. | What are the components of flash workspace | 3 | CO1 |
| 2. | List any three functions of library | 3 | CO1 |
| 3. | List any three bitmap images | 3 | CO2 |
| 4. | State the importance of paint bucket | 3 | CO2 |
| 5. | Differentiate between primary and secondary actions | 3 | CO2 |
| 6 | Define the term key frame with its importance. | 3 | CO4 |
| 7 | List various symbols | 3 | CO5 |
| 8 | Write the steps to duplicate symbol | 3 | CO5 |
| 9 | Write the steps to reuse character design | 3 | CO3 |
| 10 | Differentiate between rigging and animation | 3 | CO3 |

PART-B

Note: 1. Answer all the question and making use of internal choice.

2. Each question carries 8 marks

5 X 8=40M

- | | | | |
|--------|--|---|-----|
| 11(a). | Explain any four tools of tools panel with their properties | 8 | CO1 |
| | OR | | |
| 11(b). | Explain importance of timeline and its effects | 8 | CO1 |
| 12(a). | Explain any the steps to create realistic effects | 8 | CO3 |
| | OR | | |
| 12(b). | Explain the steps to add perspective grids in flash animation file | 8 | CO3 |
| 13(a). | Explain the procedure to create tween based animation | 8 | CO2 |
| | OR | | |

13b). Explain the differences between Motion tween and shape tween	8	CO2
14(a). List the effects that can be added to timeline and explain them	8	CO3
Or		
14(b). Explain the procedure to create any two timeline effects	8	CO3
15(a). Explain the procedure to apply any four character rigging constraints	8	CO5
(OR)		
15(b). Explain the process of exporting video as sequence of image	8	CO5

PART-C1 X10=10M

16. Write the steps to develop antweening animation with different symbols for 20sec
10M CO5

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-305	3D Animation & Graphics	5	75	20	80

S.No.	Chapter/Unit Title	No.of Periods	CO's Mapped
1.	Introduction To 3Ds MAX	15	CO1
2.	Modeling Techniques	15	CO2
3.	Material&Shadingnetwork	15	CO3
4.	Rigging&Animation	15	CO4
5.	Lighting &Rendering	15	CO5
Total Periods		75	

Course Objectives	<ul style="list-style-type: none"> • To familiarize with 3Ds MAX software • To understand Modeling Techniques • To understand Material&Shadingnetwork • To understand Rigging • To understand Lighting&Rendering
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CO NO	COURSE OUTCOMES
CO1	AG-305.1 Use the user interface Menus, tool bars of 3Ds MAX software, keyboard shortcuts.
CO2	AG-305.2 Design surfaces and Modelling techniques
CO3	AG-305.3 Apply Material&Shadingnetwork, mappings
CO4	AG-305.4 Practice Animation tools, Curve Editor, Character studio

Course Objectives:

1.0 INTRODUCTION TO 3DS MAX

- 1.1. Define user interface
- 1.2. List and explain MAX software user interface elements
- 1.3. List the Preferences and settings and explain them.
- 1.4. Explain steps in Project Work Flow
- 1.5. Explain four types of View Ports
- 1.6. List and state the purpose of Menu Bar
- 1.7. List and state the purpose of Toolbars
- 1.8. Explain Quad Bars
- 1.9. List and state the use of Navigation Controls
- 1.10. Describe the Command Panel
- 1.11. List types of Selection Commands
- 1.12. State the steps used for Selection of objects.
- 1.13. List Geometric Primitives
- 1.14. Explain the Architectural Objects
- 1.15. State the purpose of Compound Objects
- 1.16. Explain Animation & Time Controls
- 1.17. List and explain the purpose of various Display Controls
- 1.18. List and state the purpose of Key Board Short Cuts

2.0 MODELING TECHNIQUES

- 2.1. Explain the procedure of Working with Primitives and Shapes
- 2.2. State the purpose of Surface Modeling.
- 2.3. Explain about Subdivision Surface.
- 2.4. Describe the Graphite Modeling Tools.
- 2.5. Explain about Editable Poly Surface.

- 2.6. Explain about Editable Mesh Surface
- 2.7. State the use of Patch Objects
- 2.8. Define the NURBS Modeling
- 2.9. Explain the NURBS Modeling
- 2.10 . Explain about Low Res &High Level Polygon Modeling
- 2.11. State the purpose of Set & Props Modelling.
- 2.12. Explain Set& Props Modelling
- 2.13. State the purpose ofVehicle modelling.
- 2.14. Explain the procedure of Vehicle modelling

3.0. MATERIAL&SHADINGNETWORK

- 3.1. Explain Material Editor
- 3.2. List steps to open Material/Map Browser
- 3.3. Classify the Types of Material.
- 3.4. List and State the purpose of shaders
- 3.5. Define map and state steps to add map
- 3.6. Explain 2D and 3D Maps
- 3.7. State the purpose of Compositor Maps
- 3.8. List steps to apply Ray Trace Mapping
- 3.9. Explain types of Texture Mapping
- 3.10. Explain Working with UVS
- 3.11. List steps to Unwrap UVS
- 3.12 . DefineAlpha Mapping
- 3.13 . Steps to apply Texture For Gaming
- 3.14 . List Steps to apply High Resolution Texturing
- 3.15 . Explain 3Ds MAX Custom Shader.

4.0 RIGGING & ANIMATION

- 4.1 .Define 3D Animation Concepts
- 4.2 .Explain 3D Animation Methods

- 4.3 .Identify animation tools
- 4.4 .Explain various types of Animation Constraints
- 4.5 .Draw and Explain **hierarchical structure**
- 4.6 .State the purpose of Kinematics
- 4.7 .State the steps to apply Wire Parameters
- 4.8 .List types of Animation Utility
- 4.9 .State the use of components of Character Studio
- 4.10 .State the purpose of Physique Interface
- 4.11 .List Types Of Camera
- 4.12 .Explain Camera Tracker
- 4.13 .List steps to apply Set/Auto Key Mode
- 4.14 State the use of Motion Panel
- 4.15 .Define Nonlinear Animation
- 4.16 .List different method to open Curve Editor
- 4.17 .Explain Dope Sheet
- 4.18 .Steps to apply Motion Mixer
- 4.19 .Explain animating character with CAT Tools.

5.0 LIGHTING & RENDERING

- 5.1 .List types of Standard Lights
- 5.2 .List Types of Shadows
- 5.3 .List Photometric Lights
- 5.4 .State the purpose of Common Lighting Rollouts
- 5.5 .List the advantages and disadvantages of the Shadow types.
- 5.6 .Explain the Sunlight and Daylight Systems.
- 5.7 .List the steps to change the Environment background
- 5.8 . List the steps to apply Atmosphere effects
- 5.9 .List the types of Exposure Controls
- 5.10. State the purpose of Default Scan Line Render
- 5.11. Explain various types of Render Settings
- 5.12. List steps to apply Mental Ray Render Setup
- 5.13. List steps to apply I-ray Render Setup
- 5.14. State the steps to adding backgrounds and filters using Video Post

5.15. Explain Mass FX simulations.

COURSE CONTENT

1. **Introduction to 3ds Max** - User Interface – Preference & Setting – Project Work Flow – General View Port Concepts – Menu Bars – Toolbars – Quad Bars – Navigation Controls – Command Panel – Selection Commands Objects Creating – Geometric Primitives – Architectural Objects – Compound Objects – Animation & Time Controls – Display Controls – Key Board Short Cuts.
2. **MODELING TECHNIQUES** - Working With Primitives & Shapes – Surface Modeling – Subdivision Surface – Graphite Modeling Tools – Editable Poly Surface – Editable Mesh Surface – Patch Objects – NURBS Modeling – Low Res & High Level Polygon Modeling – Set & Props Modeling – Vehicle Modeling.
3. **MATERIAL & SHADING NETWORK** - Material Editor – Material/Map Browser – Types of Material – Map & Shader – 2D & 3D Maps – Compositor Maps – Ray Trace Mapping – Types of Texture Mapping – Working With UVS – Unwrap UVS – Alpha Mapping – Texture For Gaming – High Resolution Texturing – 3Ds MAX Custom Shader.
4. **RIGGING & ANIMATION:** 3D Animation Concepts Method – Animation Constraint – Hierarchies – Kinematics – Wire Parameters – Animation Utility – Character Studio – Physique Interface – Types Of Camera – Camera Tracker – Animation Concepts – Set/Auto Key Mode – Motion Panel – Nonlinear Animation – Curve Editor – Dope Sheet – Motion Mixer – CAT Tools.
5. **LIGHTING & RENDERING** :Standard Lights – Types Of Shadow – Photometric Lights – Common Lighting & Rollouts – Shadow Controls – Sunlight & Daylight System – Environment And Atmosphere Control – Exposure Control – Default Scan Line Render – Render Settings – Mental Ray Render Setup – I-ray Render Setup – Video Post – Mass FX.

6. CO-PO/PSO MATRIX

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
AG-305.1	1		1			1	2	2	2	
AG-305.2	1	2	1	2		1	2	2	2	
AG-305.3	1	2		2	2	2	3	1	3	3
AG-305.4	1	3	3	3	2	2	3	1	3	3
AG-305.5	1	3	3	3	2	2	3	1	3	3
Average	1	2.5	2	2.5	2	1.6	2.6	1.4	2.6	3

7. 3=strongly mapped, 2=moderately mapped, 1=slightly mapped

REFERENCE BOOKS

1. 3ds Max Modeling for Games Andrew Gahan Autodesk Media Entertainment 2008 - First Edition
2. 3ds Max Architectural Visualization Brain L.Smith Autodesk Media Entertainment 198 First Edition
3. 3ds Max bible Kelly L. Murdock Autodesk Media Entertainment 2012- First Edition

Model Blue print

S.No	Chapter/Unit title	No.of periods	Weightage Allocated	Marks Wise Distribution of Weightage				Question wise Distribution of Weightage				CO's Mapped
				R	U	A p	A n	R	U	A p	A n	
1	Introduction To 3Ds MAX	15	14	3	11			1	2			CO1
2	Modeling Techniques	15	14	3	3	8	10	1	1	1	*	CO2
3	Material&Shadingnetwork	15	14	3	3	8	10	1	1	1	*	CO3

	k												
4	Rigging&Ani mation	15	14	3	3	8	10	1	1	1	*	CO4	
5	Lighting &Rendering	15	14	3	3	8	10	2	1		*	CO5	
	Total	75	70 + 10(*)					6	6	3	1		

Note: Part-C: 10 marks single analytical question may be chosen from any or combination of starred chapters

Table specifying the scope of syllabus to be covered for unit tests

Unit Test	Learning outcomes to be covered
Unit test-1	From 1.1 to 3.7
Unit test-2	From 3.8 to 5.15

**DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
MODEL PAPER
3D ANIMATION & GRAPHICS
UNIT TEST-1
SCHEME: C-20SUBJ CODE: AG-305**

MAX MARKS: 40

TIME: 90Minutes

PART-A

16Marks

Instructions: 1) Answer all questions
2) First question carries 4marks, and each question of remaining carries 3marks.

1. a) Access points where users interact with designs is called as ----- (CO1)

b) Geometric primitives are present in the 3D Max.(TRUE/FALSE) (CO2)

- c) Shortcut key to open material editor is (CO3)
- 1) O 2) N 3) M 4) P
- d) Keyboard shortcut to Hide shapes is (CO3)
- 1)Shift+S2)Ctrl+S c)Alt+S 4)Alt+shift+S
- 2)List tool bars in 3D Max (CO1)
- 3)State the purpose of surface modeling (CO2)
- 4) State the steps to add map (CO3)
- 5)State the use of Patch Objects (CO2)

PART-B

3X8=24Marks

Instructions:1) Answer all questions
 2) Each question carries 8 Marks
 3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

6. a) Explain 3D Max software user interface elements (CO1)
- Or
- b) Explain Architectural Objects (CO1)
7. a) Explain about Low Res & High Level Polygon Modeling (CO2)
- Or
- b). Explain the procedure of Vehicle modelling (CO2)
8. a) Explain Material Editor (CO3)
- Or
- b) . Explain 2D and 3D Maps (CO3)

**BOARD DIPLOMA EXAMINATIONS
 DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
 3D ANIMATION & GRAPHICS
 MODEL PAPER – YEAR END EXAMINATION
 SCHEME: C-20SUBJ CODE: AG-302**

MAX MARKS:80

TIME: 3HOURS

PART-A10X3=30Marks

Note: Answer all questions

1. Listtypes of Selection Commands (CO1)
- 2.State the purpose of Compound Objects (CO1)
3. Define the NURBS Modelling (CO2)

- | | |
|--|-------|
| 4. State the purpose of Surface Modelling | (CO2) |
| 5. Define Alpha Mapping | (CO3) |
| 6. List types of Texture Mapping | (CO3) |
| 7. List Types of Camera | (CO4) |
| 8. State the use of Motion Panel | (CO4) |
| 9. Give the steps to change the Environment background | (CO5) |
| 10. List steps to apply I-ray Render Setup | (CO5) |

PART-B

5x8=40Marks

Note: Answer all questions

- | | |
|---|-------|
| 11. a) explain various MAX software user interface elements | (CO1) |
|---|-------|

OR

- | | |
|----------------------------------|-------|
| 11. b) Explain the Command Panel | (CO1) |
|----------------------------------|-------|

- | | |
|--|-------|
| 12. a) Explain about Editable Poly Surface | (CO2) |
|--|-------|

OR

- | | |
|---|-------|
| 12. b) Explain the procedure of Vehicle modelling | (CO2) |
|---|-------|

- | | |
|-------------------------------|-------|
| 13. a) Explain 2D and 3D Maps | (CO3) |
|-------------------------------|-------|

OR

- | | |
|---------------------------------|-------|
| 13. b) Explain Working with UVS | (CO3) |
|---------------------------------|-------|

- | | |
|---|-------|
| 14. a) Draw and Explain hierarchical structure | (CO4) |
|---|-------|

OR

- | | |
|-------------------------------|-------|
| 14. b) Explain Camera Tracker | (CO4) |
|-------------------------------|-------|

- | | |
|---|-------|
| 15. a) . Explain various types of Render Settings | (CO5) |
|---|-------|

OR

15. b).State the steps to adding backgrounds and filters using Video Post (CO5)

PART-C

1X10=10Marks

16. Write steps to animate human character with CAT Tools. (CO5)

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-306	GRAPHIC DESIGNING LAB	3	45	40	60

GUIDE LINES:

- ☒ All the exercises provided in the list of practical's should be completed and submitted during the semester examination.
- ☒ In order to develop skill in mastering creativity, every student should be made to practice thoroughly.
- ☒ The external examiners are requested to ensure that a single practical oriented question should not be given to more than three students while admitting a batch of 30 students during Board Examination.

Required Infrastructure (Software, Hardware and other Equipment) to be procured as per C-20:

SNO	Hardware / Equipment Needed	Software Needed
1	<p>Desktop Systems:</p> <p>Configuration:</p> <ol style="list-style-type: none"> 1. Processor :: AMD Ryzen 9 3900X Or any other equivalent intel/Motorola etc.. processor or Above 2. Mother Board: AMD 400/500 or its equivalent or above 3. RAM: 8GB(or above) dual channel DDR4 4. HDD: 500GM (SSD)/1TB(or above) 5. Graphics Card: Aorus GeForce RTX 2080 Ti Xtreme (or equivalent) 6. Monitor: 17" or above 7. Multimedia Devices like Mic, Head Phones / Speakers , USB Web camera or USB Digital Video Camera 8. Color Photo Scanner and Printer 	<p>1. Operating System: Microsoft Windows 10 professional-64 bit (Minimum)</p> <p>2.Animation and Graphics Software</p> <ol style="list-style-type: none"> a. Adobe master collection cs6 (or Above) b. Autodesk MAYA c. Autodesk 3DS MAX.

S No	Chapter/ Unit Title	No. of Periods	COs Mapped
1.	Photoshop Workspace and Work Flow	6	CO1
2.	Masking and Color Correction	6	CO2
3.	Illustrator user interface & Drawing Tools	9	CO3
4.	Designing Layout & printing process	9	CO4
5.	Designing for Media	15	CO5
	Total	45	

COURSE OBJECTIVES	Upon completion of the course the student shall be able to
	<ol style="list-style-type: none"> 1. Installation of Photoshop CS5/CS6 software. 2. Practice all menus, tools in Photoshop layout and exercise various options like present manager, image related operations ... etc. 3. Practice various options like pen tool, brushes, patterns and painting. 4. Exercise on layers operations like linking, masking, grouping etc. 5. Practice image colour correction, hue and saturation, feathering and filters etc. 6. Installation of Photoshop Illustrator CS5 software 7. Practice page settings, paths, shapes, 3D effects and opacity etc. 8. Exercise various layouts and printing processes like letter press, offset flexography etc. 9. Practice various designing medias like news papers, magazines, poster ,advertisements, banners etc 10. Practice printing, binding and finishing.

CO No		COURSE OUTCOMES
		After completion of this course the student will be able to
CO 1	AG-306.1	Practice usage of Photoshop CS5/CS6 software IDE after installation and configuration.
CO 2	AG-306.2	Practice patterns, paintings, masking, color correction and filters
CO 3	AG-306.3	Use Adobe Illustrator software to use drawing tools,3D effects and opacity
CO 4	AG-306.4	Practice different design layouts and printing process

CO 5	AG-306.5	Develop design-medias for news papers, magazines, poster ,advertisements, banners etc
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CO-PO/PSO MATRIX

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
AG-306.1	1	1	1	1	1		2	1	2	
AG-306.2	2	2	2	1	1	2	2	1	2	
AG-306.3	2	3	3	1	3	2	3	1	2	2
AG-306.4	2	3	2	1	1	2	3	1	3	2
AG-306.5	2	3	2	1	3		3	1	3	2
Average	1.8	2.4	2	1	1.8	2	2.6	1	2.4	2

3=strongly mapped, 2=moderately mapped, 1=slightly mapped

LEARNING OUTCOMES:

1. Practice user interface options of Photoshop layout.
2. Exercise on various image related operations like size, resolution, colour changeoverlying etc.
3. Exercise on drawing shapes
4. Exercise using pen tool and painting
5. Exercise on image colour correction
6. Exercise on blurring and sharpness
7. Practice Illustrator environment and work area
8. Exercise on strokes and fill colours
9. Exercise on opacity mask and clipping mask
10. Create a digital advertisement of an educational institution.
11. Create a sticker for CD/DVD cover set
12. Design a poster/pamphlet in Photoshop
13. Design corporate logos using Adobe Illustrator
14. Design a newspaper using Adobe Illustrator
15. Create character and background designs using Adobe Illustrator
16. Create a brochure design for cell phones at your own concept in Adobe Illustrator

The competencies and key competencies to be achieved by the student

S.No.	Name of the experiment	Objectives	Key Competencies
1	Practice user interface options of Photoshop layout.	Identify the different options of Menu bar, tool bar in Photoshop layout	<ul style="list-style-type: none"> ❖ Practice the different options in Menu bar, ❖ Practice the tools on tool bar
2	Exercise on various image related operations like size, resolution, colour changeoverlying etc.	Identify the various image options in Photoshop	<ul style="list-style-type: none"> ❖ Practice Photoshop image options
3	Exercise on Drawing shapes	Identify various drawing shapes	<ul style="list-style-type: none"> ❖ Practice Drawingshapes
4	Exercise using pen tool and painting	Identify pen tool and painting tool	<ul style="list-style-type: none"> ❖ Practice Pen and Painting tools ❖ Differentiate between copy and painting
5	Exercise on image colour correction	Identify various image colour options	<ul style="list-style-type: none"> ❖ Practice on various image colour options
6	Exercise on blurring and sharpness	Identify blurring and sharpness tools	<ul style="list-style-type: none"> ❖ Practice blurring and sharpness tools
7	Practice Illustrator environment and work area	Identify the different options of Menu bar, tool bar in Illustrator	<ul style="list-style-type: none"> ❖ Practice different options in Menu bar, tool bar in Illustrator ❖ Practice IDE of Illustrator.
8	Exercise on strokes and fill colours	Identify strokes and fill colours	<ul style="list-style-type: none"> ❖ Practicestrokes and fill colours
9	Exercise on opacity mask and	Identify various tools to opacity mask and	<ul style="list-style-type: none"> ❖ Practice opacity mask and clipping mask

	clipping mask	clipping mask	
10	Create a digital advertisement of an educational institution.	Identify different tools necessary for advertisement like background colour, foreground colour, shapes etc	<ul style="list-style-type: none"> ❖ Identify different tools ❖ Practice color settings, shape tools and pathfinder
11	Create a sticker for CD/DVD cover set	Identify different tools necessary for advertisement like shadows, reflections offset path etc	<ul style="list-style-type: none"> ❖ Practice shades, reflections, offset path etc ❖ Know the use of sticker
12	Design a poster/pamphlet in Photoshop	Identify different tools necessary for poster like typographic, shadows etc	<ul style="list-style-type: none"> ❖ Know various options related to poster creation ❖ Practice typographic, shades etc Know the use of poster
13	Design corporate logos using Adobe Illustrator	Identify different tools necessary for logo like text, shapes and colours etc	<ul style="list-style-type: none"> ❖ Know various options related to logo creation ❖ Practice text, shapes, colors etc ❖ Know the usage of logo
14	Design a newspaper using Adobe Illustrator	Identify different tools necessary for newspaper like text, shapes, colours and alignments etc	<ul style="list-style-type: none"> ❖ Know various options related to newspaper creation ❖ Practice text, shapes, colours etc
15	Create character and background designs using Adobe Illustrator	Identify different tools necessary for character and background like pen, shapes, colours, opacity, stroke etc	<ul style="list-style-type: none"> ❖ Practice various options related to character creation and background ❖ Practice pen, shapes, colours, opacity and strokes etc
16	Create a brochure design for cell phones at your own concept in Adobe Illustrator	Identify different tools necessary for brochure like text, layouts, guides, etc	<ul style="list-style-type: none"> ❖ Know various parts of brochure ❖ Practice text, layouts, guides etc ❖ Designing a brochure

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-307	2D Digital Animation Lab	3	45	40	60

GUIDE LINES:

- All the exercises provided in the list of practical's should be completed and submitted during the semester examination.
- In order to develop skill in mastering creativity, every student should be made to practice thoroughly.
- The external examiners are requested to ensure that a single practical oriented question should not be given to more than three students while admitting a batch of 30 students during Board Examination.

S No	Chapter/ Unit Title	No. of Periods	COs Mapped
1.	DIGITAL CONVERSION	5	CO1,CO2
2.	INTRODUCTION TO ANIMATION	10	CO1,CO2,CO4
3.	FLASH APPLICATIONS	10	CO1,CO2,,CO3,CO4
4.	CHARACTER ANIMATION	20	CO1,CO2,CO3,CO4,CO5
	Total	45	

COURSE OBJECTIVES	<p>Upon completion of the course the student shall be able to</p> <ol style="list-style-type: none"> 8. Practice on Edit, test, playback flash animation designs 9. Apply usage of tools, objects and animation effects. 10. Design animations using timeline, different tweening methods, symbols, libraries with various drawing modes 11. Develop animation using character design and background settings 12. Create animation using character rigging constraints, frame by frame 13. Develop animation with different poses of character
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CO No		COURSE OUTCOMES
CO 1	AG-307.1	Perform Edit, test and playback of designed animation
CO 2	AG-307.2	Designing various symbols and objects using tools and library
CO 3	AG-307.3	Developing animations using symbols and objects with timeline
CO5	AG-307.4	Designing animations with backgrounds, effects of timeline
CO5	AG-307.5	Applying character rigging constraints on various animations

CO-PO/PSO MATRIX

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
AG-307.1	2			2	3		2	3	2	
AG-307.2	2	2	3	2	3		2	2		
AG-307.3	2	2	3	2	2		2	2		
AG-307.4	2	2	3	2	3	2	2			1
AG-307.5	2	3	2	3	3	1	2			2
Average	2	2.25	2.75	2.2	2.8	1.5	2	2.33	2	1.5

3=Strongly mapped , 2=moderately mapped, 1=slightly mapped

LEARNING OUTCOMES:

1. Design the back ground of nature environment for animation clip.
2. Create the ball bouncing using frame by frame animation techniques (10sec).
3. Create the web jingles with the given reference and concepts.
4. Design the character for animation with thereference
5. Create flight animation in 3 different shots for 20sec.
6. Create the car animation with proper background for 20sec.
7. Design your character and animate the facial expression for 10sec.
8. Create character animation by apply rigging constraints like walk, run, jump, pull and push
9. Create 2D animation using moving guide layer and masking
10. Develop Animation based on symbols at least for 10sec

The competencies and key competencies to be achieved by the student

S.No.	Name of the experiment	Objectives	Key Competencies
1	Design the background of nature environment for animationclip.	Develop animation Develop background Combine both	Identify the required suitable background nature environment Mix with animation
2	Create the ball bouncing using frame by frame animation techniques (10sec).	Design frames with ball in different angles Set timeline as required Animate frames	identify the no of frames required arrange in sequence to Animate frame by frame set the timeline for 10 sec accordingly playback
3	Create the web jingles with the given reference andconcepts.	Create web jingles Apply given references	Identify the given reference with suitable concepts Create the web jingles
4	Design the character for animation with thereference	Design the required suitable character Apply reference Use timeline and animate	identify the given references use the designed character set timeline for required period of animation playback
5	Create flight animation in 3 different shots for 20sec.	Design or choose flight image with matching posses Set timeline for 20sec Arrange flight frames in sequence, playback	Identify 3 different posses of flight Arrange frames in order Use time line and playback

6	Create the car animation with proper background for 20sec.	Design car image Chose required background Set timeline for 20sec Animate	Identify suitable background Use the timeline and set time for 20sec playback
7	Create character animation by apply rigging constrains like walk, run, jump, pull and push	Design character Develop different symbols with required rigging constraints Create and arrange frames	Identify and arrange the sequence of frames Animate for the required period
8	Create 2D animation using moving guide layer and masking	Create the moving guide layer Apply masking Design the suitable 2D animation	Use the moving guide layer Apply suitable mask Design suitable 2D animation playback
9	Develop Animation based on symbols at least for 10sec	Design the required symbols Set timeline for 10sec Apply animation on symbols	Use the symbols and library Use the timeline Playback for 10sec

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-308	3D ANIMATION AND GRAPHICS LAB	3	45	40	60

Required Infrastructure(Software, Hardware and other Equipment) to be procured as per C-20:

SNO	Hardware / Equipment Needed	Software Needed
1	<p>Desktop Systems:</p> <p>Configuration:</p> <p>9. Processor :: AMD Ryzen 9 3900X Or any other equivalent intel/Motorola etc.. processor or Above</p> <p>10. Mother Board: AMD 400/500 or its equivalent or above</p> <p>11. RAM: 8GB(or above) dual channel DDR4</p> <p>12. HDD: 500GM (SSD)/1TB(or above)</p> <p>13. Graphics Card: Aorus GeForce RTX 2080 Ti Xtreme (or equivalent)</p> <p>14. Monitor: 17" or above</p> <p>15. Multimedia Devices like Mic, Head Phones / Speakers , USB Web camera or USB Digital Video Camera</p> <p>16. Color Photo Scanner and Printer</p>	<p>1. Operating System: Microsoft Windows 10 professional-64 bit (Minimum)</p> <p>2.Animation and Graphics Software</p> <p>d. Adobe master collection cs6 (or Above)</p> <p>e. Autodesk MAYA</p> <p>f. Autodesk 3DS MAX.</p>

S.No.	Chapter/Unit Title	No.of Periods	CO's Mapped
1.	Introduction To 3Ds MAX	9	CO1
2.	Modeling Techniques	6	CO2
3.	Material&Shadingnetwork	9	CO3
4.	Rigging&Animation	9	CO4
5.	Lighting &Rendering	12	CO5
Total Periods		45	

Course Objectives	<ul style="list-style-type: none"> • To familiarize with 3Ds MAX software • To understand Modeling Techniques • To understand Material&Shadingnetwork • To understand Rigging • To understand Lighting&Rendering
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CO NO		COURSE OUTCOMES
CO1	AG-308.1	Practice the user interface Menus, tool bars of 3Ds MAX software, keyboard shortcuts.
CO2	AG-308.2	Design surfaces and Modelling techniques
CO3	AG-308.3	Develop animations using Material&Shadingnetwork, mappings
CO4	AG-308.4	Practice Animation tools, Curve Editor, Character studio in developing 3D animations.
CO5	AG-308.5	Use Lighting, Rendering, filters and FX simulations on 3D animations.

8. CO-PO/PSO MATRIX

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
AG-308.1	1		1			1	2	2	2	
AG-308.2	1	2	1	2		1	2	2	2	
AG-308.3	1	2		2	2	2	3	1	3	2
AG-308.4	1	3	3	3	2	2	3	1	3	2
AG-308.5	1	3	3	3	2	2	3	1	3	3
Average	1	2.5	2	2.5	2	1.6	2.6	1.4	2.6	2.3

9. 3=strongly mapped, 2=moderately mapped, 1=slightly mapped

Learnig outcomes:

1. Installation of 3Ds max studio and practice IDE.
2. Practice commands, menus and toolbars.
3. Create 3d geometric objects like cone, cylinder, sphere, and cube.
4. Create an Exterior Set modeling with given reference Image.
5. Model the interior set with given reference image.
6. Practice editable poly surfaces and Editable mesh surfaces.
7. Create vehicle modeling application using a bike.
8. Texture the given exterior model with PSD.
9. Texture the given set model with bitmap file using material editor
10. Practice ray trace mapping for an exterior setup like a tree.
11. Create your college logo animation
12. Create animation application to rotate a globe on inclined stand.
13. Create the lighting for exterior with mental ray lighting system.
14. Create the lighting for interior with I-ray render lighting system.
15. Create a 3D animation application to add backgrounds and filters using Video Post

The competencies and key competencies to be achieved by the student

S.No.	Name of the experiment	Objectives	Key Competencies
1	Installation of 3Ds max studio and practice IDE.	Identify different options of IDE in 3D Max	❖ Practice IDE options
2	Practice commands, menus and toolbars.	Identify commands, menus and tool bars	❖ Practice commands, menus and tool bars
3	Create 3d geometric objects like cone, cylinder, sphere, and cube.	Identify different Geometric objects	❖ Practice geometric objects
4	Create an Exterior Set modeling with given reference Image.	Identify exterior modeling tools	❖ Practice exterior modeling tools like shading, layers etc ❖ Practice types of images importing in to 3D max
5	Model the interior set with given reference image.	Identify interior modeling tools	❖ Practice interior modeling tools like shading, layers etc ❖ Practice types of images importing in to 3D max
6	Practice editable poly surfaces and Editable mesh surfaces.	Identify editable poly surfaces and mesh surface tools	❖ Practice editable poly surface tools and editable mesh surface tools like vertices, edges, borders, polygon etc
7	Create vehicle modeling application using a bike.	Identify vehicle modeling tools	❖ Practice vehicle modelling tools like vertices, edges, borders, polygon, connect, etc
8	Texture the given exterior model with PSD	Identify various texture images	❖ Practice various materials and textures etc
9	Texture the given set model with bitmap file using material editor	Identify material editor options	❖ Practice material editor options and importing bitmap images
10	Practice ray trace mapping for reflective and refractive surfaces.	Identify ray trace map option	❖ Practice material editor options and ray trace map options
11	Create Your college logo animation	Design your college logo	❖ Practice shapes, colors and rendering options
12	Create animation application to rotate a globe on inclined stand.	Animate the globe with rotate options	❖ Practice rotation of object options
13	Create the lighting for exterior with mental ray lighting system.	Identify mental ray render lighting tools	❖ Practice mental ray render lighting options
14	Create the lighting for interior with I-ray render lighting system.	Identify I-ray render lighting tools	❖ Practice I-ray render lighting options
15	Create a 3D animation	Identify background tool,	❖ Practice Video Post

application to add backgrounds and filters using Video Post	filters and video post options	options
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Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-309	2D GRAPHICS LAB	3	45	40	60

GUIDE LINES:

- The theory topics given below are to be taught as part of this Lab.
- All the exercises provided in the list of practical's should be completed and submitted during the semester examination.
- In order to develop skill in mastering creativity, every student should be made to practice thoroughly.
- The external examiners are requested to ensure that a single practical oriented question should not be given to more than three students while admitting a batch of 30 students during Board Examination.

Required Infrastructure (Software, Hardware and other Equipment) to be procured as per C-20:

SNO	Hardware / Equipment Needed	Software Needed
1	<p>Desktop Systems:</p> <p>Configuration:</p> <p>17. Processor :: AMD Ryzen 9 3900X Or any other equivalent intel/Motorola etc.. processor or Above</p> <p>18. Mother Board: AMD 400/500 or its equivalent or above</p> <p>19. RAM: 8GB(or above) dual channel DDR4</p> <p>20. HDD: 500GM (SSD)/1TB(or above)</p> <p>21. Graphics Card: Aorus GeForce RTX 2080 Ti Xtreme (or equivalent)</p> <p>22. Monitor: 17" or above</p>	<p>1. Operating System: Microsoft Windows 10 professional-64 bit (Minimum)</p> <p>2. Animation and Graphics Software</p> <p>g. Adobe master collection cs6 (or Above)</p> <p>h. Autodesk MAYA</p> <p>i. Autodesk 3DS MAX.</p>

23.	Multimedia Devices like Mic, Head Phones / Speakers , USB Web camera or USB Digital Video Camera	
24.	Color Photo Scanner and Printer	

LIST OF Animation Exercise

Theory content:

1. **Animation Production Techniques:** Animation Principles with light box, Flip book Animation theory, Character sketching, Different Character styles, Color Models, Foregrounds and Back Grounds, Movements of elements, Pivot Based and joint Movement, Different Functions and poses of human, Lip sink
2. **Important Application of Lightbox:** Key Poses, In-Between, Timing, Retouch up of drawing , Clean up, Dope sheets, Walk, Run and Jump, Flexibility, Acting, Body language, Change of Expressions, Formation of Story Board , Camera movements and Angles, Recording, Finalizing of Story Board, Animatic creation with Audio Narration, View output

Learning Outcomes:

S No	Chapter/ Unit Title	No. of Periods	COs Mapped
1.	Basics of	6	CO1
2.	Environment Lighting	9	CO2
3.	Mental ray Lighting Setup	9	CO3
4.	Mental ray Rendering Techniques	12	CO4
5.	V ray Lighting Work Flow	9	CO5
	Total	45	

COURSE OBJECTIVES	<p>Upon completion of the course the student shall be able to</p> <ol style="list-style-type: none"> 1. Introduction to animation principles. 2. Sketching characters with different styles. 3. Working with foregrounds and backgrounds.
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	<ul style="list-style-type: none"> 4. Practicing movement of elements and poses. 5. Practicing walk, run, jump sequences . 6. Practicing body part movements and expressions. 7. Creation and finalising storyboards. 8. Adding audio narration to animation sequences.
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CO No		COURSE OUTCOMES
CO 1	AG-309.1	Working with comic characters animation
CO 2	AG-309.2	Developing Backgrounds for story board animation sequences.
CO 3	AG-309.3	Working with motion cycles of parts of comic characters
CO 4	AG-309.4	Develop story boards and Audio narration.
CO 5	AG-309.5	Working with change of expressions and camera movement.

CO-PO/PSO MATRIX

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
AG-309.1	2	2	1	1		1		1	1	
AG-309.2	1	1	3	2	3	1	2		2	2
AG-309.3		2	3	1		3	1	1	1	3
AG-309.4	1	2	2	2	3		2	1	3	2
AG-309.5			3	2			1			2
Average	1.3	1.7	2.4	1.6	3	1.6	1.5	1	1.7	2.25

3=Strongly mapped , 2=moderately mapped, 1=slightly mapped

Learning Outcomes.

1. Practice drawing basic shapes in 2d.
2. Practice drawing diagrams of animals, humans, birds etc..
3. Design any two comic character for 2d animation process with proper poses
4. Create the two nature BG for your story board animation sequence(3min)
5. Create the ball bounce animation with stretch & squash (3min)
6. Create the normal walk cycle for your own character(2cycles)
7. Create the tail animation for any character for (2min)
8. Create run cycle for any own cartoon character(3min)

9. Create any five facial expression of your characters for (1min)
10. Create Hair movement for your character.(1 min)
11. Create jumping sequence of your character (3 min)
12. Create eye lid animation of your character (2 min).
13. Create eye brow movement of your character (2 min)
14. Create lip movement of your character (1 min).
15. Practice eye ball movement of your character(1 min)

The competencies and key competencies to be achieved by the student

S.No.	Name of the experiment	Objectives	Key Competencies
1	Practice drawing basic shapes in 2d.	Working with basic shapes	<ul style="list-style-type: none"> ❖ Working with basic drawing elements ❖ viewoutput
2	Practice drawing diagrams of animals, humans, birds etc..	Creation of drawings	<ul style="list-style-type: none"> ❖ Combining various shapes to form a drawing ❖ View output
3	Design any two comic character for 2d animation process with proper poses	Create characters with different poses.	<ul style="list-style-type: none"> ❖ Identifying characters ❖ Identifying poses ❖ Generate animation sequence. ❖ View output
4	Create the two nature BG for your story board animation sequence(3min)	Creation of different Backgrounds	<ul style="list-style-type: none"> ❖ Using backgrounds ❖ Working with storyboard. ❖ View output
5	Create the ball bounce animation with stretch & squash (3min)	Working with bouncing objects.	<ul style="list-style-type: none"> ❖ Identify bouncing sequence ❖ Using stretch and squash. ❖ Working with timing ❖ Working with angles. ❖ View output

6	Create the normal walk cycle for your own character(2cycles)	Working with walk cycles.	<ul style="list-style-type: none"> ❖ Identify movement sequences. ❖ Using timing and angles. ❖ Sound narration. ❖ View output
7	Create the tail animation for any character for (2min)	Working to move Body elements .	<ul style="list-style-type: none"> ❖ Identify movement of body elements. ❖ Identify poses. ❖ View output
8	Create run cycle for any own cartoon character(3min)	Work with run cycles.	<ul style="list-style-type: none"> ❖ Identify running sequences. ❖ Using timing and angles. ❖ Sound narration. ❖ View output
9	Create any five facial expression of your characters for (1min)	Identify Facial expressions	<ul style="list-style-type: none"> ❖ Identify change of expressions ❖ Using timing and angles. ❖ Sound narration. ❖ View output
10	Create Hair movement for your character.(1 min)	Identify body part elements	<ul style="list-style-type: none"> ❖ Identify change of expressions ❖ Using timing and angles. ❖ Sound narration. ❖ View output
11	Create jumping sequence of your character (3 min)	Generation of jump sequences.	<ul style="list-style-type: none"> ❖ Identify jump sequences ❖ Identify change of expressions. ❖ Using timing and angles. ❖ Sound narration. ❖ View output
12	Create eye lid animation of your character (2 min).	<i>Identify body element movement</i>	<ul style="list-style-type: none"> ❖ Identify structure of eye lid with other parts. ❖ View output

13	Create eye brow movement of your character (2 min)	Identify Body elements.	<ul style="list-style-type: none"> ❖ Identify the structure of brow construction. ❖ Working with angles and timings. ❖ Sound narration ❖ View output
14	Create lip movement of your character (1 min).	Practice lipsink.	Identify lip sinking with narrated sound.
15	Practice eye ball movement of your character(1 min)		<ul style="list-style-type: none"> ❖ Identify the structure of eye ball construction. ❖ Identify poses ❖ Working with angles and timings. ❖ Sound narration ❖ View output

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-310	Mini Project	6	90	40	60

Guidelines:

1. Students have to be divided into groups consisting of 4 to 6 members.
2. Each group has to develop a Miniproject by applying the knowledge acquired during previous and current semesters.
3. They have to approach nearby TV studios, Film Industries, Photo and Video Studios , Multimedia centers , DTP centres, Printing presses to collect the information and the Day to day Short term Projects related to Photography, Animation, Print Media and Visual media.
4. They have to be in a position to develop Visiting Cards, Logos, Invitation cards, Brochures, News papers, banners, Hotel Menu cards etc..
5. Develop Book covers for Various Local Publishers.
6. Any other local Animation and Multimedia related Jobs have to be taken up.
7. They have to Produce the Project report at the end of the semester.
8. They should conduct minimum three seminars/Workshops to explain the progressive development of their project with co project members and the staff.

IV SEMESTER

**DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
SCHEME OF INSTRUCTIONS AND EXAMINATION**

CURRICULUM-2020

(IV Semester)

Sub Code	Name of the Subject	Instruction Periods/Week		Total Periods Per Semester	Scheme Of Examinations			
		Theory	Practicals		Duration (hrs)	Sessional Marks	End Exam Marks	Total Marks
THEORY SUBJECTS								
AG-401	Mathematics III	3	-	45	3	20	80	100
AG-402	Digital Photography	5	-	75	3	20	80	100
AG-403	3D modelling and Texturing	5	-	75	3	20	80	100
AG-404	Web Designing	5	-	75	3	20	80	100
AG-405	3D lighting and Rendering Techniques	5	-	75	3	20	80	100
PRACTICAL SUBJECTS								
AG-406	3D modelling and Texturing lab	-	3	45	3	40	60	100
AG-407	Digital Photography Lab	-	3	45	3	40	60	100
AG-408	Communication Skills	-	3	45	3	40	60	100
AG-409	3D lighting and Rendering Techniques lab	-	3	45	3	40	60	100
AG-410	Networking and Web Designing Lab *Note: Develop a Mini project with Web Designing	-	7	105	3	40	60	100
	Total	23	19	630	-	300	700	1000

AG-401&408 common with all branches

AG-403,404,405,406,409,410 common with DAME branch

AG402 is common with AM-305, AG-407 is common with AM-308

C-20

ENGINEERING MATHEMATICS-III

Course Code	Course Title	No. of Periods/week	Total No. of periods	Marks for FA	Marks for SA
AG-401	Engineering Mathematics-III	3	45	20	80

S.No.	Unit Title	No. of periods	COs mapped
1	Higher order Linear Differential equations with constant coefficients	15	CO1
2	Laplace Transforms	18	CO2
3	Fourier Series	12	CO3
Total Periods		45	

Course Objectives	<ul style="list-style-type: none"> (i) To learn the principles of solving differential equations of second and higher order. (ii) To comprehend the concept of Laplace transformations and inverse Laplace transformations. (iii) To understand the concept of Fourier Series expansion of functions.
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Course Outcomes	CO1	Solve homogeneous and non-homogeneous differential equations of second and higher order.
	CO2	Find Laplace and inverse Laplace transforms of various functions.
	CO3	Expand given functions as Fourier series and half- range Fourier Sine and Cosine series.

ENGINEERING MATHEMATICS – III

Learning Outcomes

Unit-I

Differential Equations of higher order

C.O. 1 Solve homogeneous and non-homogeneous differential equation of second and higher order.

L.O 1.1 Solve Differential equations of the type $(aD^2 + bD + c)y = 0$ where a, b, c are real numbers and provide examples.

1.2 Solve higher order homogeneous differential equations with constant coefficients and provide examples.

1.3 Define complementary function, particular Integral and general solution of a non-homogeneous differential equation.

1.4 Describe the methods of solving $f(D)y = X$ where $f(D)$ is a polynomial of n^{th} order and X is a function of the forms $k, e^{ax}, \sin ax, \cos ax, x, x^n$ and their linear combinations where n is a positive integer, with examples.

Unit-II

Laplace Transforms

C.O. 2 Find Laplace and inverse Laplace transforms of various functions.

L.O. 2.1 Define Laplace Transform and explain the sufficient conditions of existence of Laplace Transform

2.2. Obtain Laplace transforms of standard functions and solve simple problems.

2.3 Write the properties of Laplace Transform – Linearity property, First shifting theorem (without proof) and Change of Scale property and solve simple problems.

2.4. Write the Laplace Transform of unit step function and second shifting theorem (without proof) and solve simple problems.

2.5. Write formulae for Laplace transform of functions with multiplication by t^n and division by t, Laplace transform of derivatives, evaluation of some definite integrals using Laplace Transforms and solve simple problems.

Syllabus for Unit test-I completed

2.6 Define inverse Laplace Transform, obtain inverse Laplace Transforms of standard functions and solve simple problems.

2.7 Write linearity property, first and second shifting theorems (without proof), change of scale property of inverse Laplace transform and solve simple problems.

2.8 Write inverse Laplace transforms of derivatives and integrals and solve simple problems.

2.9 Write inverse Laplace transforms of functions with multiplication by s and division by s and solve simple problems.

2.10 Write inverse Laplace transforms of functions using partial fractions and solve some simple problems.

2.10 Define convolution of two functions, state convolution theorem (without proof) and solve simple problems.

Unit-III

Fourier series

C.O. 3 Expand given functions as Fourier series and half- range Fourier Sine and Cosine series

L.O. 3.1 Define the orthogonality of functions in an interval.

3.2 Define Fourier series of a function in the intervals $(c, c + 2\pi)$ and $(c, c + 2l)$ and write the Euler's formulae for determining the Fourier coefficients.

3.3 Write sufficient conditions for the existence of Fourier series expansion of a function.

3.4 Find Fourier series of simple functions in the range $(0, 2\pi)$ and $(-\pi, \pi)$

3.5 Write Fourier series for even and odd functions in the interval $(-\pi, \pi)$ and $(-l, l)$ expand simple functions.

3.6 Write Fourier series expansion of a function over the interval $(0, 2l)$ and $(-l, l)$ and expand simple functions.

3.7 Write half-range Fourier sine and cosine series of a function over the interval $(0, \pi)$ and $(0, l)$ and expand simple functions.

Syllabus for Unit test-II completed

Engineering Mathematics – III

CO/PO - Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	1	1				2	3	2
CO2	3	3	3	3				3	3	3
CO3	3	3	3	3				3	3	3
Avg	3	2.66	2.33	2.33				2.66	3	2.66

3 = Strongly mapped (High), **2** = Moderately mapped (Medium), **1** = Slightly mapped (Low)

Note:

PO5: Appropriate quiz programme may be conducted at intervals and duration as decided by concerned teacher.

PO6: Seminars on applications of mathematics in various engineering disciplines are to be planned and conducted.

PO7: Such activities are to be planned that students visit library to refer standard books on Mathematics and latest updates in reputed national and international journals, attending seminars, learning mathematical software tools.

PSO1: An ability to understand the concepts of basic mathematical concepts and to apply them in various areas like computer programming, civil constructions, fluid dynamics, electrical and electronic systems and all concerned engineering disciplines.

PSO2: An ability to solve the Engineering problems using latest software tool, along with analytical skills to arrive at faster and appropriate solutions.

PSO3: Wisdom of social and environmental awareness along with ethical responsibility to have a successful career as an engineer and to sustain passion and zeal for real world technological applications.

C-20

Engineering Mathematics – III

PO- CO – Mapping strength

PO no	Mapped with CO no	CO periods addressing PO in column I		Level (1,2 or 3)	Remarks
		No	%		
1	CO1, CO2, CO3	45	100%	3	>40% Level 3 Highly addressed
2	CO1, CO2, CO3	37	82.2%	3	
3	CO1, CO2, CO3	32	71.1%	3	
4	CO1, CO2, CO3	32	71.1%	3	
5					25% to 40% Level 2 Moderately addressed
6					
7					
PSO 1	CO1, CO2, CO3	37	82.2%	3	5% to 25% Level 1 Low addressed
PSO 2	CO1, CO2, CO3	45	100%	3	
PSO 3	CO1, CO2, CO3	36	80%	3	
					<5% Not addressed

ENGINEERING MATHEMATICS – III

(Common Subject)

Course Content

Unit I: Differential Equations of higher order

1. Solve Homogenous linear differential equations with constant coefficients of order two and higher with emphasis on second order.
2. Solve Non-homogenous linear differential equations with constant coefficients of the form $f(D)y = X$ where X is in the form $k(\text{constant}), e^{ax}, \sin ax, \cos ax, x^n$, where n is a positive integer, finding complimentary function, particular integral and general solution.

Unit II: Laplace Transforms

3. Definition, sufficient conditions for existence of LT, LT of elementary functions, linearity property, state first shifting theorem, change of scale property, multiplication by t^n , division by t , LT of derivatives and integrals, LT of unit step function, state second shifting theorem, inverse Laplace transforms- state shifting theorems and change of scale property, multiplication by s^n and division by s , derivatives, integrals, examples of inverse LT using partial fractions, state convolution theorem with simple examples.

Unit III: Fourier series

4. Orthogonality of trigonometric functions, Representation of a function in Fourier series over the interval $(c, c + 2\pi)$ and $(c, c + 2l)$, Euler's formulae, sufficient conditions for existence of Fourier series expansion of a function, Fourier series expansion of basic functions limited to $k(\text{constant}), x, x^2, \sin ax, \cos ax, e^{ax}$ and their combinations over the intervals $(0, 2\pi), (-\pi, \pi), (0, 2l), (-l, l)$, Fourier series for even and odd functions over $(-\pi, \pi)$ and $(-l, l)$, Fourier half-range sine and cosine series over $(0, \pi)$ and $(0, l)$

Textbook:

Engineering Mathematics-I, a textbook for first year diploma courses, prepared & prescribed by SBTET, AP.

Reference Books:

1. B.S.Grewal, Higher Engineering Mathematics, Khanna Publishers
2. M.R. Spiegel, Schaum's Outline of Laplace Transforms, Schaums' Series
3. M.Vygodsky, Mathematical Handbook: Higher Mathematics, Mir Publishers, Moscow.

Blue print

S. No	Chapter/ Unit title	No of Periods	Weightage allotted	Marks wise distribution of weightage				Question wise distribution of weightage				COs mapped
				R	U	Ap	An	R	U	Ap	An	
1	Unit – I Higher order Linear Differential equations with constant coefficients	15	28	11	11	3	3	2	2	1	1	CO1
2	Unit - II Laplace Transforms	18	33	11	11	11	0	2	2	2	0	CO2
3	Unit - III Fourier Series	12	19	3	3	3	10	1	1	1	1	CO3
Total		45	80	25	25	17	13	5	5	4	2	

R: Remembering Type : 25 Marks

U: understanding Type : 25 Marks

Ap: Application Type : 17 Marks

An: Analysing Type : 13 Marks

C-20

Engineering Mathematics – III

Unit Test Syllabus

Unit Test	Learning Outcomes to be Covered
Unit Test-I	From LO 1.1 to 2.5
Unit Test-II	From LO 2.6 to 3.7

Unit Test I

C –20, AG-401

State Board of Technical Education and Training, A. P

First Year

Subject name: **Engineering Mathematics-II**

Sub Code: **AG -401**

Time : 90 minutes

Max.marks:40

Part-A

16Marks

Instructions: (1) Answer all questions.
(2) First question carries four marks and the remaining questions carry three marks each

- Answer the following:
 - Write the auxiliary equation for given differential equation $(D^2 + 4)y = 0$ (CO1)
 - For given differential equation $f(D)y = 0$, if roots of auxiliary equation are 1,-1,then $y =$ _____ (CO1)
 - $L\{e^{3t}\} =$ _____ (CO2)
 - $L\{f(t)\} = \bar{f}(s)$ then $L\{e^{at} f(t)\} = \bar{f}(s+a)$: State TRUE/FALSE (CO2)
- Solve $(D^2 - 2D + 1)y = 0$. (CO1)
- Find the particular integral of $(D^2 + D + 4)y = e^x$ (CO1)
- Evaluate $L\{(t-1)^2\}$ (CO2)
- Evaluate $L\{t^2 + 2\cos t + 3\sin t\}$ (CO2)

Part-B

3×8=24

- Instructions:** (1) Answer **all** questions.
(2) Each question carries **eight** marks
(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

6. A) Solve $(D^4 - 5D^2 + 4)y = 0$. (CO1)

or

B) Solve $(D^2 + D - 6)y = 1 + e^{-3x}$. (CO1)

7. A) Solve $(D^2 + 3D + 2)y = x^2 + \sin x$. (CO1)

or

B) Solve $(D^2 - D)y = 2e^x + 3\cos x$. (CO1)

8. A) Evaluate $L\{e^{3t} \cos^2 t\}$ (CO2)

or

B) Evaluate $L\{e^t (t+1)^2\}$ (CO2)

Unit Test II

C-20, AG-401

State Board of Technical Education and Training, A. P

First Year

Subject name: **Engineering Mathematics-II**

Sub Code: **AG-401**

Time : 90 minutes

Max.marks:40

Part-A

16Marks

Instructions: (1) Answer **all** questions.
(2) First question carries **four** marks and the remaining questions carry **three** marks each

1. Answer the following:

a. $L\{f(t)\} = \bar{f}(s)$ then $L\{tf(t)\} = -\frac{d}{ds}(\bar{f}(s))$: State TRUE/FALSE (CO2)

b. $L^{-1}\left\{\frac{1}{s-3}\right\} = ?$ (CO2)

c. $L^{-1}\left\{\frac{1}{s^2+a^2}\right\} = ?$ (CO2)

d. Write the Fourier series for the function $f(x)$ in the interval $c < x < c + 2\pi$. (CO3)

2. Evaluate $L\{te^t\}$. (CO2)

3. Evaluate $\int_0^{\infty} e^{-3t} \sin 4t dt$. (CO2)

4. Evaluate $L^{-1}\left\{\frac{3}{s+4} + \frac{2}{s^2+16} - \frac{s}{s^2-4}\right\}$. (CO2)

5. Evaluate Fourier coefficient a_0 for $f(x)$ in the interval $(-\pi, \pi)$. (CO3)

- Instructions:** (1) Answer all questions.
(2) Each question carries eight marks
(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

6. A) Evaluate $L\{te^{-t} \cos t\}$. (CO2)

or

B) Evaluate $L\left\{\frac{\cos at - \cos bt}{t}\right\}$. (CO2)

7. A) Evaluate $L^{-1}\left\{\frac{s}{(s+1)(s^2+1)}\right\}$. (CO2)

or

B) Evaluate $L^{-1}\left\{\frac{s}{(s-1)^4}\right\}$. (CO2)

8. A) Obtain the Fourier series for the function $f(x) = e^x$ in the interval $(0, 2\pi)$. (CO3)

or

B) Obtain the half range Fourier cosine series of $f(x) = x^2$ in $(0, 1)$. (CO3)

END EXAM MODEL PAPER

STATE BOARD OF TECHNICAL EDUCATION, A.P
ENGINEERING MATHEMATICS –AG- 401

TIME : 3 HOURS MODEL PAPER- I MAX.MARKS : 80M

PART-A

Answer All questions. Each question carries THREE marks.

10x3=30M

1. Solve $(D^2 - 3D + 2)y = 0$. CO 1
2. Solve $(D^2 + D + 1)y = 0$. CO 1
3. Find the particular integral of differential equation $(D^2 + 4)y = \sin 2x$. CO 1
4. Find the particular integral of differential equation $(D^2 + 3D + 2)y = e^{3x}$. CO 1
5. Find $L\{2e^{3t} + \sin 3t + \cosh t\}$. CO2
6. Find $L\{e^t \cos 4t\}$. CO2
7. Find $L^{-1}\left\{\frac{1}{s^2} + \frac{4}{s^2 + 4} + \frac{3s}{s^2 - 9}\right\}$. CO2
8. Find the value of a_0 in the Fourier expansion of $f(x) = e^x$ in the interval $(0, 2\pi)$. CO3
9. Find the Fourier coefficients of $f(x)$ in the interval $(-\pi, \pi)$. CO3
10. Find the value of a_1 in the half range cosine series of $f(x) = k$ in the interval $(0, \pi)$. CO3

PART-B

Answer All questions. Each question carries EIGHT marks. 5x8=40M

11. A) Solve $(D^3 - 6D^2 + 11D - 6)y = 0$. CO 1

Or

B) Solve $(D^2 - 9)y = e^{3x} + e^{-3x}$. CO 1

12. A) Solve $(D^2 - 4D + 4)y = \sin 3x$. CO1

Or

B) Solve $(D^2 + 2D + 2)y = x^2 + x + 1$. CO1

13. A) Evaluate $L\{te^t \cos t\}$. **CO2**

Or

B) Evaluate $L\{t^2 \cos 2t\}$. **CO2**

14. A) Evaluate $L\left\{\frac{\sin 5t \sin t}{t}\right\}$. **CO2**

Or

B) Evaluate $\int_0^{\infty} \frac{\sin t}{t} dt$. **CO2**

15. A) Find $L^{-1}\left\{\frac{1}{s(s+1)(s+2)}\right\}$. **CO2**

Or

B) Using convolution theorem find $L^{-1}\left\{\frac{s}{(s^2+1)(s^2+4)}\right\}$. **CO2**

PART-C

Answer the following question. Question carries TEN marks. 1x10=10M

16. Find the Fourier expansion of $f(x) = x + x^2$ in the interval $(-\pi, \pi)$ and hence deduce

$$\text{that } \frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \dots = \frac{\pi^2}{12}.$$

CO3

STATE BOARD OF TECHNICAL EDUCATION, A.P
ENGINEERING MATHEMATICS – AG-401

TIME : 3 HOURS

MODEL PAPER- 2

MAX.MARKS : 80M

PART-A

Answer All questions. Each question carries THREE marks. 10x3=30M

1. Solve $(D^2 + 4D + 4)y = 0$. **CO 1**
2. Solve $(D^2 + 9)y = 0$. **CO 1**
3. Find the particular integral of differential equation $(D^2 - 4D + 3)y = e^{4x}$. **CO 1**
4. Find the particular integral of differential equation $(D^2 - 4D - 5)y = \cos 2x$. **CO 1**
5. Find $L\{2 - e^{-2t} + \sinh 6t\}$. **CO2**
6. Find $L\{e^{-2t}t^2\}$. **CO2**
7. Find $L^{-1}\left\{\frac{1}{s^2} + \frac{4}{s^2 + 4} + \frac{3s}{s^2 - 9}\right\}$. **CO2**
8. Find the value of a_0 in the Fourier expansion of $f(x) = x + x^2$

in the interval $(-1,1)$.

CO3

9. Write Euler's formula of Fourier expansion of $f(x)$ in the interval $(c, c + 2\pi)$. **CO3**
10. Find the value of a_1 in the half range cosine series of $f(x) = \pi$ in the interval $(0, \pi)$.

CO3

PART-B

Answer All questions. Each question carries EIGHT marks. 5x8=40M

11. A) Solve $(D^3 + 1)y = 0$. **CO 1**

Or

B) Solve $(D^2 + D - 6)y = e^{3x} + e^{-3x}$. **CO 1**

12. A) Solve $(D^2 - 3D + 2)y = \cos 3x$. **CO1**

Or

B) Solve $(D^2 + 2D + 1)y = 2x + x^2$. **CO1**

13. A) Evaluate $L\{e^{3t} \cos^2 t\}$. **CO2**

Or

B) Evaluate $L\{t^2 \cos 2t\}$. **CO2**

14. A) Evaluate $L\left\{\frac{e^{-at} - e^{-bt}}{t}\right\}$. **CO2**

Or

B) Using Laplace transforms evaluate $\int_0^{\infty} \cos 3t dt$. **CO2**

15. A) Find $L^{-1}\left\{\log\left(\frac{s^2+1}{(s-1)^2}\right)\right\}$. **CO2**

Or

B) Using convolution theorem find $L^{-1}\left\{\frac{1}{(s^2+1)(s+1)}\right\}$. **CO2**

PART-C

Answer the following question. Question carries TEN marks. 1x10=10M

16. Find the Fourier expansion of $f(x) = (\pi - x)^2$ in the interval $0 < x < 2\pi$ and hence

deduce that $\frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \dots = \frac{\pi^2}{6}$.

CO3

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-402	DigitalPhotography	5	75	20	80

S.No.	Chapter/Unit Title	No.of Periods	CO's Mapped
1.	BASIC OF PHOTOGRAPHY	15	CO1,CO2,CO5
2.	DIGITAL PHOTOGRAPHY	15	CO2,CO3
3.	IMAGE COMPOSITION	15	CO2,CO4,CO5
4.	DIGITAL IMAGING	15	CO1,CO2,CO3
5.	CONCEPT PHOTOGRAPHY	15	CO1,CO2,CO4
Total Periods		75	

Course Objectives	<ul style="list-style-type: none"> • Describe Camera Mechanism and various equipment in digital photography • apply lighting techniques in handling various photo shoots along with projecting various styles in photo graphic • Analyse various image format handlings& uses • Apply Digital color correction &grading techniques • Printing & photo sharing
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CO NO	COURSE OUTCOMES
CO1	AG-402.1 Distinguish the relationship between human eye and camera and basic principles of Photography.
CO2	AG-402.2 Practicing Digital camera Functions.
CO3	AG-402.3 Illustrate various image composing techniques.
CO4	AG-402.4 Explain digital imaging principles
CO5	AG-402.5 Explain industrial Applications of photography techniques and documentation.

Course Objectives:

1. Basic Photography

- 1.1 Define the term Camera
- 1.2 Differentiate between Human Eye and Camera
- 1.3 Relate human eye and camera.
- 1.4 Define the term Photography.
- 1.5 Explain about history and development of Photography.

- 1.6 List different types of camera
- 1.7 state its importance of different camera.
- 1.8 State the purpose of Lens.
- 1.9 List different types of Lens
- 1.10 state their usage of lens
- 1.11 State the importance of Light.
- 1.12 List and explain different types of Lights.
- 1.13 Define the term filter.
- 1.14 State the need of filter.
- 1.15 List different types of Filters and explain their usage.
- 1.16 Define is film with its need
- 1.17 List different types of Films.
- 1.18 Explain the terms Speed, Size & Temperature with respect to film.
- 1.19 What is reversal film?
- 1.20 Describe Reversal Films.
- 1.21 Explain about manipulation of Color
- 1.22 Explain about manipulation of Light.
- 1.23 Explain about Black and white Photography
- 1.24 Explain about Color Photography
- 1.25 Describe Negatives.
- 1.26 List and explain Color materials.
- 1.27 Explain color Processing
- 1.28 Explain Printing.

2. Digital Camera Functioning

- 2.1 Define Digital Camera
- 2.2 Define Digital Still Camera.
- 2.3 Define Digital SLR Camera
- 2.4 Explain operation of Digital SLR Camera
- 2.5 Explain the functions and operation of Digital Camera
- 2.6 Explain functions of major Components of Digital Camera with neat diagram
- 2.7 List and explain modes of digital Camera.
- 2.8 List and explain Advantages of digital camera.
- 2.9 Describe Light Meter and explain its Usage.
- 2.10 Describe Flash.
- 2.11 List types of Flash
- 2.12 Explain the purpose of flash
- 2.13 State the importance of Electronic Flash
- 2.14 Explain the process of selecting Flash Mode Setup for Digital Imaging

- 2.15 List and explain Desktop Computer Components needed for Digital camera functioning.
- 2.16 List and explain Data Storage and Transfer Options.
- 2.17 List the Software used for Digital Processes.
- 2.18. Explain features of any two software used for digital process.

3. IMAGE COMPOSITION

- 3.1 List Basic Techniques for Better Image.
- 3.2 Define Aperture and state it's Usage?
- 3.3 Describe Shutter Speed?
- 3.4 Explain Usage of shutter speed.
- 3.5 Describe Depth of Field?
- 3.6 Define Focal Length.
- 3.7 Describe Exposure Meter
- 3.8 Explain the terms Basic Lighting, Key Light and Fill Light.
- 3.9 Define Low Key and High Key Picture.
- 3.10 Describe Rule of Third.
- 3.11 Describe Angle of View.
- 3.12 Explain Different Angles of a Camera.
- 3.13 List various Perspectives of camera angle?
- 3.14 Explain Over the Shoulder Shot (OSS) picture format
- 3.15 Describe the term lighting
- 3.16 Explain indoor and outdoor lightening
- 3.17 Describe the terms Exposing, Focusing.
- 3.18 Explain the Types of lighting
- 3.19 Describe about Controlling lights

4. Digital Imaging

- 4.1 Define the terms Light room ,LightRoom Workspace and Palettes
- 4.2 Explain Special effects techniques in digital imaging
- 4.3 Describe about motion pictures.
- 4.4 Define the terms manipulation of image, framing and trimming.
- 4.5 Explain the process of Choosing Color and Color grading Brush Shape.
- 4.6 Explain the Operations and Usage of Art Marks tool and Art Layers,
- 4.7 Explain the Operations and Usage of, Layer Mark and Create Layer,
- 4.8 Explain the Operations and Usage of Fill Tool and Trashcan
- 4.9 Explain the Operations and Usage of Cloning, Clone Align and Art Filter
- 4.10 Explain the Operations and Usage of Plug ins, Rule of Thumb and Kerning Leading.
- 4.11 Explain about various Formats of Digital Image on Various Media.

5. Concept Photography

- 5.1 Describe Photo journalism.
- 5.2 State the importance of Advertising Photography.
- 5.3 Explain about Industrial Photography
- 5.4 List and explain the Architectural Photography Documents
- 5.5 Explain about the Visual story telling
- 5.6 Explain Stop motion Photography Techniques
- 5.7 Explain the process of Creating Photography Albums

CO-PO/PSO MATRIX

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	1	2					2		
CO2	3	3	1	3				2		
CO3	2	2	3	2	3	2	2	2	2	2
CO4	2	2	2			2	2	2		2
CO5	3	3	1	3				2		
Avg	2	2	3	2	3	2	2	2		2

3=Strongly mapped, 2=moderately mapped, 1=slightly mapped

COURSE CONTENT:

1. BASIC OF PHOTOGRAPHY

Human Eye and Camera - Basics of Camera - Define Photography. Brief History and Development of Photography. Camera –Types- Usage. Lens- Types Usage. Lights- Types- Usage. Filters –Types- Usage. Film – Types. Film- Speed and Size Temperature, Speed etc., Reversal Films.– Manipulation of Color and Light.– Black and White and Color Photography – Negatives – Color materials, Processing and Printing.

2. DIGITAL CAMERA FUNCTIONING

Define –Digital- Digital Still Camera. Digital SLR Camera – () Camera operations Types. Working with Digital Camera – Major Components and Functions, Camera Operation, Mode, Advantages. Light Meter- Usage. Flash - Types-Usage- Electronic Flash – Selection of Right Flash Mode Setup for Digital Imaging-Windows. Desktop Computer Components- Data Storage and Transfer Options. Software for Digital Processes.

3. IMAGE COMPOSITION

Basic Techniques for Better Image. – Aperture-Usage. – Shutter- Speed- Usage. Depth of Field. – Focal Length.– Exposure Meters –Basic Lighting- Key Light-Fill Light.– Low Key and High Key Picture– Rule of Third. – Angle of View. Different Angles of a Camera – High Angle – Eye Level Angles – Low Angles - Long Shot (LS) – Medium Shot (MS) – Close-up (CU) – Perspectives – Over the Shoulder Shot (OSS Picture Format)– Understanding lighting-indoor and outdoor, – Exposing and Focusing, Types of lighting, – Natural and Artificial Lights, – Controlling lights,

4. DIGITAL IMAGING

Light room. Light Room Workspace. Palettes, Special effects techniques- motion pictures etc., manipulation of image, framing & trimming. Choosing Color, Color grading Brush Shape. Operations and Usage of Tools- Art

Marks, Art Layers, – Layer Mark, Create Layer, – Fill Tool, Trashcan, Cloning, – Clone Align, Art Filter –, Plug ins, Rule of Thumb, Kerning Leading.– Image Various Formats Digital Image on VariousMedia.

5. CONCEPT PHOTOGRAPHY

Photo journalism, – Advertising Photography - Industrial Photography- Architectural Photography Documents- Visual story telling- Stop motion Photography Techniques- Creating Photography Albums

REFERENCE BOOKS

1. Understanding Exposure: How to Shoot Great Photographs with a Film or Digital Camera, by Bryan Peterson, Am photo Books, August 1st 2004 Second Edition
2. The Wonders of Photography, by Dennis P Curtin, Watson-Gustily, 2009 Fifth Edition
3. The Basic Photography Guide for Photograph, by Langfords, Courier Dover Publications, 2000 - First Edition
4. The Digital Photography, by Scott Kelby, Watson-Gustily , 2002- Second Edition

Model Blue Print:

S.No	Chapter/Unit title	No.of periods	Weightage Allocated	Marks Wise Distribution of Weightage				Question wise Distribution of Weightage				CO's Mapped
				R	U	A p	An	R	U	A p	An	
1	BASIC OF PHOTOGRAPHY	20	17	3	14			1	3			CO1,CO3,CO4
2	DIGITAL PHOTOGRAPHY	15	14	3	11			1	2			CO2
3	IMAGE COMPOSITION	15	14		6	8	10		2	1	*	CO1,CO3
4	DIGITAL IMAGING	15	14	3	3	8	10	1	1	1	*	CO1,CO4,CO5
5	CONCEPT PHOTOGRAPHY	10	11		3	8	10		1	1	*	CO1,CO2,C05
	Total	75	70 + 10(*)	9	37	24	10	3	9	3	1	

Note: Part-C: 10 marks single analytical question may be chosen from any or combination of starred chapters

Table specifying the scope of syllabus to be covered for unit tests

Unit Test	Learning outcomes to be covered
Unit test-1	From 1.1 to 3.2
Unit test-2	From 3.3 to 5.7

DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
MODEL PAPER
Digital Photography
UNIT TEST-1

SCHEME:C-20 :: SUB CODE:AG-402

MAX MARKS:40

TIME: 90Minutes

PART-A

16Marks

Instructions: 1) Answer all questions
2) First question carries 4marks, and each question of remaining carries 3marks.

1. a) A photograph is a type of raster image. (True/False) (CO1)
- b) ----- is equipment that is used to record images. (CO2)
- c) The rule of thirds involves mentally dividing up your image using 2 horizontal lines and ----- vertical lines (CO2)
- d) Which is a memory device used with digital cameras? (CO2)
- A. Sd card B. Memory stick
- C. Floppy disk D. All of the above
- 2) State the importance of Light. (CO1)
- 3) List different modes of Digital Camera. (CO2)
- 4) What is the need of Exposure Meter (CO3)
- 5) Write about Negatives in Photography (CO1)

PART-B

3X8=24Marks

Instructions: 1) Answer all questions
2) Each question carries 8 Marks
3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

6. a) Explain about history and development of Photography. (CO1)
- Or
- b) Explain about Black and white Photography (CO1)
7. a) Draw and Explain functions of major Components of Digital Camera (CO2)
- Or
- b) Explain the process of selecting Flash Mode Setup for Digital Imaging. (CO2)
8. a) Explain Different Angles of a Camera. (CO3)
- Or
- b) Explain the Types of lighting (CO3)

**BOARD DIPLOMA EXAMINATIONS
DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
MODEL PAPER – YEAR END EXAMINATION
DIGITAL PHOTOGRAPHY**

SCHEME:C-20 :: SUB CODE:AG-402

MAX MARKS:80

TIME: 3HOURS

PART-A

10X3=30Marks

Note: Answer all questions

- | | |
|--|-------|
| 1. Define the term Camera | (CO1) |
| 2.State the need of filter. | (CO1) |
| 3.List different types of Lens | (CO1) |
| 4. Define Digital Still Camera. | (CO2) |
| 5.Describe Flash. | (CO2) |
| 6.What is Aperture and state it's Usage? | (CO3) |
| 7.Describe Exposure Meter | (CO3) |
| 8. Define the terms Light room, Light Room Workspace | (CO4) |
| 9.Describe about motion pictures. | (CO4) |
| 10. What is Photo journalism | (CO5) |
| 10. What is Advertising Photography | (CO5) |

PART-B

Note: Answer all questions**5x8=40Marks**

- | | |
|---|-------|
| 11. A.Explain about ColorPhotography | (CO1) |
| OR | |
| 11.B. ExplainPrinting in Photography. | (CO1) |
| 12.A. Explain operation of Digital SLR Camera | (CO2) |
| OR | |
| 12.B. Explain Desktop Computer Components needed for Digital camera functioning | (CO2) |
| 13.A.Explain Different Angles of a Camera. | (CO3) |

OR

13.B. Explain indoor and outdoor lightening. (CO3)

14.A.Explain about Special effects techniques in digital imaging (CO4)

OR

14.B.Explain the process of Choosing Color and Color grading Brush Shape. (CO4)

15.A.Explain about Industrial Photography (CO5)

OR

15.B.Explain the process of Creating Photography Albums (CO5)

PART-C

1X10=10Marks

16. Create a Photo Album from Digital Pictures Using FlipHTML5 (CO5)

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-403	3D Modelling and Texturing	5	75	20	80

S.No.	Chapter/Unit Title	No.of Periods	CO's Mapped
1.	Maya Interface & Workflow	15	CO1
2.	Low Polygon Modelling Techniques	10	CO2
3.	Advance Modelling Techniques	20	CO3
4.	Texturing Work Flow	15	CO4
5.	Advance Texturing Techniques	15	C05
Total Periods		75	

Course Objectives	<ul style="list-style-type: none"> • To familiarize with User interface tools in MAYA software. • To develop modelling techniques for Polygon using Polygon tools and set model. • To develop 3D modelling techniques • To understand Mapping Techniques in texturing. • To apply character texturing techniques
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Course Outcomes	At the end of the course the student able to learn following:		
	CO1	AG-403.1	Describes various User interface tools in MAYA software
	CO2	AG-403.2	Develop different Logos and sample models using Polygon modelling Techniques
	CO3	AG-403.3	Develop a picture using 2D/3D Modelling techniques
	CO4	AG-403.4	Apply different mapping Techniques.
	CO5	AG-403.5	Apply different character texturing Techniques

CO-PO/PSO Matrix:

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
AG-403.1	3					1		3	1	1
AG-403.2	2	2	2	1		3		1	3	1
AG-403.3	3	1		1		1	1		1	1
AG-403.4	1		2	2	1		1	2	1	2
AG-403.5	3		2		1	1	1	2		2
Average	2.4	1.5	2	1.3	1	1.5	1	2	1.5	1.4

3=Strongly mapped , 2=moderately mapped, 1=slightly mapped

Learning Outcomes:

1.0 MAYA INTERFACE&WORKFLOW

- 1.1. Identify Menu bar and Status bar in Maya layout.
- 1.2. State the need of Shelves in Maya layout.
- 1.3. Study about Toolbox tools to move, scale and rotate object.
- 1.4. Describe viewport in Maya layout.
- 1.5. Explain navigation controls in Maya layout.
- 1.6. Explain the importance of Channel Box in Maya layout.
- 1.7. Describe Layer Editor in Maya layout.
- 1.8. Explain Attribute Editor in Maya layout.
- 1.9. Explain Time & Range Slider options in Maya layout.
- 1.10. Check the various playback options in Maya layout.
- 1.11. Explain command help lines in Maya.
- 1.12. State the need of outliner in Maya.
- 1.13. Describe save preferences in Maya layout
- 1.14. Demonstrate Export and Import options in Maya.
- 1.15. Study various Project Folder Setting in Maya interface.
- 1.16. Explain different types of Curves in Maya.
- 1.17. Explain about various Curve Editing Tools.
- 1.18. Explain Curve Fillet and Rebuild Curves.
- 1.19. Explain about NURBS Surfaces.
- 1.20. Describe the necessity of object and component in Maya.
- 1.21. Explain the process of Revolve in Maya.
- 1.22. State the need of Loft in Maya.
- 1.23. Explain briefly Planar concept in Maya
- 1.24. Explain Extrude concept.
- 1.25. Describe Brail and Bevel tools in Maya.
- 1.26. State the need of NURBS Boolean in Maya.
- 1.27. Explain Sculpt Geometry Tools in Maya.
- 1.28. Describe Stitching & Fillet techniques in Maya.

2.0 LOW POLYGON MODELLING TECHNIQUES:

- 2.1. Study the purpose of Polygons Primitives Object & Component.
- 2.2. Describe Polygon Selection– Combine and Group.
- 2.3. State the need of Extract in polygon modeling.
- 2.4. Explain the concept of Booleans in polygon modeling.
- 2.5. Explain Triangulate & Quad angulate.
- 2.6. Explain Component Selection Tools.
- 2.7. Explain Component Editing Tools.
- 2.8. Explain various Split & Bevel Tools.
- 2.9. Describe Poke & Wedge Face with examples.
- 2.10. Explain different Chamfers & Split Tools.
- 2.11. Explain various Sculpt Geometry Tools.
- 2.12. Develop Logos for various examples like your college, branch, city... etc.
- 2.13. Develop a Simple Models according to your ideology by using various polygon modelling techniques.

3.0 ADVANCE MODELLING TECHNIQUES

2D MODEL PROCESS:

- 3.1. Study about basic Anatomy Needs for Character Model.
- 3.2. Explain Model sheet preparation in 2D modelling.
- 3.3. Explain the rules to draw Model Sheet in different views.
- 3.4. Explain the Conditions of Model Sheet Preparation in 2D modelling.
- 3.5. Describe the steps to prepare model sheet in Front View and Side View.
- 3.6. Explain the Concept of Characters in 2D modeling.
- 3.7. Explain Pose Studies in 2D modeling.
- 3.8. Mention the rules to draw Rapid Sketches in 2D modeling.
- 3.9. Explain Character Blocking in 2D modeling.
- 3.10. State the need of Polygon Nodes in 2D modeling.
- 3.11. Explain Mesh concept with examples in 2D modeling.
- 3.12. Mention the steps to Avoid Triangle in 2D modeling.
- 3.13. Describe Basic Shapes Making in 2D modeling.
- 3.14. Create Low Resolution Model in 2D modeling.
- 3.15. Explain Poly Count in 2D modeling.
- 3.16. Mention the steps to Reduce Poly Count in 2D modeling.

3D MODEL PROCESS:

- 3.17. Know how to set Model Sheets in 3D modeling.
- 3.18. Explain the concept of Image Planes in modeling with examples.
- 3.19. Explain how to create the following
 - 3.19.1. Body Parts
 - 3.19.2. Arms
 - 3.19.3. Legs
 - 3.19.4. Fingers

- 3.19.5. Toe
- 3.20. Describe PolygonNormal's concept in 3D modeling.
- 3.21. Explain Sculpting Meshes in 3D modeling.
- 3.22. State the need of Fine Tuning in 3D modeling.
- 3.23. Give the steps to create Portrait Model in 3D modeling.
- 3.24. Describe the Head Blocking concept in 3D modeling.
- 3.25. Explain the steps to create Meshes in 3D modeling.
- 3.26. State the need of Polygon Editing Tools in 3D modeling.
- 3.27. Explain how to use Polygon Tools in 3D modeling.
- 3.28. Explain the steps to create
 - 3.28.1. Male Head
 - 3.28.2. Female Head
 - 3.28.3. Child
 - 3.28.4. Old Man
 - 3.28.5. Realistic Head and Cartoon Head
 - 3.28.6. Ear and Inner Eye
 - 3.28.7. Inner Mouth, Teeth and Tongue
 - 3.28.8. Polygon Hair

4.0 TEXTURING WORK FLOW

- 4.1. Know about Hyper Shade in Texturing.
- 4.2. State the need of networking concept in Texturing.
- 4.3. Explain Texture mapping with different examples.
- 4.4. Explain about File Texture.
- 4.5. Describe Texture Resolution concept in Texturing.
- 4.6. Explain about Texture Filtering.
- 4.7. Explain the following Mapping Methods in Texturing.
 - 4.7.1. Projection Mapping
 - 4.7.2. Stencil Mapping
 - 4.7.3. Label Mapping
 - 4.7.4. Bump Mapping
- 4.8. Describe 2D & 3D Texture Positioning with examples.
- 4.9. Explain following Mapping types
 - 4.9.1. Planar Mapping
 - 4.9.2. Cylindrical Mapping
 - 4.9.3. Spherical Mapping.
- 4.10. Explain about Mapping Manipulators in Texturing.
- 4.11. Explain Layered Textures with examples.
- 4.12. State the need of Unwrapping in Texturing.
- 4.13. Describe UV Texture Editor.
- 4.14. Explain the steps to create UV Files.
- 4.15. Explain different UV Edit Tools.
- 4.16. Explain the purpose of UV Snap Shot in Texturing.
- 4.17. Explain about Photoshop Edit tool.
- 4.18. Explain Blending Modes in Texturing.
- 4.19. Describe various Painting Techniques in Texturing.

- 4.20. Explain how to use various Brushes in Texturing.
- 4.21. Write the steps to create PSD Network.
- 4.22. Explain the process of reloading Maya.
- 4.23. State the need of Color Correction in Texturing.
- 4.24. Describe Painting Techniques in Texturing.
- 4.25. Explain the steps to create Bump Map and Specular Map in Texturing.

5.0 ADVANCE TEXTURING TECHNIQUES

- 5.1. Explain character texturing techniques.
- 5.2. Explain Normalize concept in Texturing.
- 5.3. Describe about Rotate concept in Texturing.
- 5.4. Explain about Map UV Border in Texturing.
- 5.5. State the purpose of Relax concept in Texturing.
- 5.6. Describe about Untold in Texturing.
- 5.7. Explain about Layout in Texturing.
- 5.8. Explain the steps to cut UV Edges, Split and Move in Texturing.
- 5.9. State the purpose of UV Snap Shot in Texturing.
- 5.10. Explain the concept of Texturing in Photoshop.
- 5.11. Explain the steps to painting Skin Tone in Texturing.
- 5.12. Explain different Brush Techniques in Texturing.
- 5.13. Explain the steps to create the Depth in Texturing.
- 5.14. Describe various Coloring Techniques in Texturing.
- 5.15. Explain the process to update With Maya.
- 5.16. Explain the steps to creating Bump Map.
- 5.17. Write the process to create PSD File to Jpeg Texture / PNG Texture.
- 5.18. Explain the steps to exporting Mesh in Texturing.
- 5.19. Describe about Z-brush Interface.
- 5.20. Explain about Preferences Setting.
- 5.21. Explain about High- Resolution Texture Files.
- 5.22. Describe various Spotlight Tools.
- 5.23. Explain different Spotlight Techniques.
- 5.24. Explain how to work with RGB & MRGB Channels.
- 5.25. Explain about RGB Intensity.
- 5.26. Explain Z Texturing Character in Texturing.
- 5.27. Explain Setting Texture Resolution in Texturing.
- 5.28. State the steps to create Displacement Mapping and Normal Map in Texturing.

COURSE CONTENT:

- 1. Maya interface & workflow** – Menu Bars- Status Bar – Shelves –Toolbox -Viewport & Navigation Controls - Channel Box – Layer Editor –Attribute Editor –Time & Range Slider –Playback Options – Command & Help Lines – Outliner – Save Preferences – Export & Import – Project Folder Setting – Intro to Curves –Types Of Curves – Curve Editing Tools – Curve Fillet – Rebuild Curves – Nurbs Surfaces – Object & Component –

Revolve – Loft – Planar & Extrude – Brail & Bevel – Nurbs Boolean –Sculpt Geometry Tool – Stitching & Fillet .

2. LOW POLYGON MODELLING TECHNIQUES:

Polygons Primitives – Object &Component – Polygon Selection– Combine, Group, Extract& Booleans– Triangulate &Quad angulate– Component Selection Tools – Component Editing Tools – Split & Bevel Tools – Poke & Wedge Face – Chamfers & Split Tools Sculpt Geometry Tool -Logos & Simple Models

3. ADVANCE MODELLING TECHNIQUES

2D MODEL PROCESS: Anatomy Needs For Character Model – Model Sheet Preparation – Conditions Of Model Sheet Preparation Draw Model Sheet – Front View – Side View – Designing Concept Characters – Pose Studies – Rapid Sketches– Character Blocking – Polygon Nodes – Mesh – Avoid Triangle – Basic Shapes Making – Create Low Resolution Model – Poly Count – Reduce Poly Count

3D MODEL PROCESS: Model Sheets –Image Planes – Blocking With Primitives – Creating Body Parts – Creating Arms & Legs – Creating Fingers & Toe – PolygonsNormal's– Sculpting Meshes – Fine Tuning-Create Portrait Model – Head Blocking – Create Meshes – Needs Of Polygon Editing Tools – How To Use Polygon Tools – Male Head – Female Head – Child – Old Man – Realistic Head – Cartoon Head – Ear – Inner Mouth – Teeth – Tongue - Inner Eye – Polygon Hair

4. TEXTURING WORK FLOW

Hyper Shade & Networking – Intro to Texture mapping– File Texture – Texture Resolution – Texture Filtering –Mapping Methods– Projection Mapping – Stencil Mapping – Label Mapping – Bump Mapping –2D &3D Texture Positioning –Mapping types-Planar Mapping – Cylindrical Mapping –Spherical Mapping– Mapping Manipulators –Layered Textures

Unwrapping – UV Texture Editor – Create UV Files – UV Edit Tools – UV Snap Shot – Photoshop Edit tool –Blending Modes – Painting Techniques – Using Various Brushes – Creating PSD Network – Reloading Maya – Color Correction – Painting Techniques – Create Bump Map – Specular Map

5. ADVANCE TEXTURING TECHNIQUES

Character texturing Techniques-Normalize, Rotate– Map UV Border, Relax, Untold, Layout – Cut UV Edges, Split, Move– UV Snap Shot – Texturing In Photoshop – Painting Skin Tone – Brush Techniques – Create The Depth – Coloring Techniques – Update With Maya – Creating Bump Map –Create PSD File To Jpeg Texture / PNGTexture

Exporting Mesh – Z-brush Interface – Preferences Setting – High- Resolution Texture Files – Spotlight Tools – Spotlight Techniques – Working With RGB & MRGB Channels – RGB Intensity – Z Texturing Character – Setting Texture Resolution – Create Displacement Mapping –Normal Map.

REFERENCE BOOKS

1. Mastering Maya AERIC KELLER WILEY INDIA PVT LTD 2009 - First Edition
2. Autodesk Maya Techniques Marc – André ignanodon neoreel Autodesk media Entertainment 2008 First Edition
3. Maya with Photoshop Daniel gray BPB Publications 2007- First Edition

Model Blue Print:

S.No	Chapter/Unit title	No.of periods	Weightage Allocated	Marks Wise Distribution of Weightage				Question wise Distribution of Weightage				CO's Mapped
				R	U	A p	A n	R	U	A p	A n	
1	Maya Interface & Workflow	15	14	3	11			1	2			CO1
2	Low Polygon Modelling Techniques	10	11	3		8		1		1		CO2
3	Advance Modelling Techniques	20	17	3	6	8		1	2	1		CO3
4	Texturing Work Flow	15	14	3	11		10	1	2		*	CO4
5	Advance Texturing Techniques	15	14	6	8		10	2	1		*	CO5
	Total	75	70 + 10(*)					6	7	2		

Note: Part-C: 10 marks single analytical question may be chosen from any or combination of starred chapters

Table specifying the scope of syllabus to be covered for unit tests

Unit Test	Learning outcomes to be covered
Unit test-1	From 1.1 to 3.16
Unit test-2	From 3.17 to 5.28

**DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
MODEL PAPER
3D MODELLING AND TEXTURING
UNIT TEST-1
SCHEME: C-20SUBJ CODE:AG-403**

MAX MARKS:40

TIME: 90Minutes

PART-A16Marks

Instructions: 1) Answer all questions

2) First question carries 4marks, and each question of remaining carries 3marks.

1. a) Triangulation is the decomposition of a polygonal area into a set of triangles. (True/False) (CO2)
- b) NURBS stands for ----- (CO1)
- c) ----- is an animation technique in which key poses are created to establish timing and placement of characters and props in a given scene or shot. (CO3)
- d) Which one of the following is a type of curve in MAYA [] (CO1)
 - I) Fillet Curve II) Rebuild Curve III) Both I & II IV) None
- 2) State the importance of Viewport in MAYA software. (CO1)
- 3) What is curve and list any two types of curves. (CO1)
- 4) List various Sculpt geometry tools used in polygon modelling techniques. (CO2)

5) Write about rapid sketches. (CO3)

PART-B

3X8=24Marks

Instructions:1) Answer all questions

2) Each question carries 8 Marks

3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

6. a) Explain about various Curve Editing Tools. (CO1)

Or

b) Explain Time & Range Slider options in Maya layout. (CO1)

7. a) List and Explain Component Selection Tools. (CO2)

Or

b) Explain about Chamfers & Split Tools. (CO2)

8. a) Write the Conditions of Model Sheet Preparation in 2D modeling. (CO3)

Or

b) Explain about Polygon Nodes in detail. (CO3)

**BOARD DIPLOMA EXAMINATIONS
DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
MODEL PAPER – YEAR END EXAMINATION
3D MODELLING AND TEXTURING
SCHEME: C-20SUBJ CODE:AG-403**

MAX MARKS:80

TIME: 3HOURS

PART-A

Note: Answer all questions

10X3=30Marks

1. Write briefly about Revolve in MAYA technology. (CO1)

2. List out the Toolbox tools used in MAYA software. (CO1)

3. What are the various Sculpt geometry tools used in polygon modelling techniques. (CO2)

4. State the purpose of Pose studies? (CO3)

5. Write briefly about rapid sketches. (CO3)

6. What is fine tuning in 3D. (CO3)

7. State about 2D & 3D Texture Positioning. (CO4)

8. List various Mapping types. (CO4)
9. State about UV Snap Shot. (CO5)
10. Explain briefly how to exporting Mesh. (CO5)

PART-B

Note: Answer all questions

5x8=40Marks

11. A. Explain about various Curve Editing Tools. (CO1)
OR
B. Explain Time & Range Slider options in Maya layout. (CO1)
12. A. State and Explain Component Editing Tools. (CO2)
OR
B. Explain about various Chamfers & Split Tools. (CO2)
13. A. Explain the Conditions of Model Sheet Preparation in 2D modelling. (CO3)
OR
B. Explain the steps to use Polygon Tools in 3D. (CO3)
14. A. Explain about Mapping Manipulators in detailed. (CO4)
OR
B. Explain various Mapping Methods. (CO4)
15. A. Explain the steps to Cut UV Edges, Split and Move. (CO5)
OR
B. Explain how to create Displacement Mapping and Normal Map. (CO5)

PART-C

1X10=10Marks

16. Draw the picture of a dog by using painting techniques in Photoshop. (CO4)

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-404	Web Designing	5	75	20	80

S.No.	Chapter/Unit Title	No.of Periods	CO's Mapped
1.	UNIT I: HYPERTEXT MARKUP LANGUAGE (HTML)	15	CO1
2.	UNIT II: SCRIPTING LANGUAGE	15	CO1,CO2
3.	UNIT III: DREAMWEAVER CREATIVE CLOUD	15	CO1,CO3
4.	UNIT IV: WORK SPACE AND VISUAL DEVELOPMENT	15	CO1,CO3,CO4
5.	UNIT V: FLASH WITH ACTION SCRIPTS	15	CO5
Total Periods		75	

Course Objectives	<ul style="list-style-type: none"> • Describe basic concepts of WWW and Learn HTML, CSS. • Developing Scripts using Javascript • working with Dream viewer to handle uploading , importing files , folders , images and videos. • Analyze Integrating Layouts, photo shop, Dream viewer, templates to optimize workspace and visual web development with HTML • Working with Action scripts of flash to develop web pages with Movie clips , animations and Games to develop dynamic websites to make user activities live .
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CO NO		COURSE OUTCOMES
CO1	AG-404.1	Develop simple web pages using HTML.
CO2	AG-404.2	Develop webpage using Client side scripting Language.
CO3	AG-404.3	Working with Creative cloud environment.
CO4	AG-404.4	Apply features of Workspace and Visual development in web designing.
CO5	AG-404.5	Developing live web pages to achieve dynamic programming.

CO-PO/PSO MATRIX

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	2	2	2	2		3	1	
C02	2	2	2	2	1	2		3	1	
C03	2	2	2	2	1	2	3	1		
C04	2	2	2	2	1	2		3	2	
C05	2	2	2	2	1	2		3	3	2
Average	2	2	2	2	1.2	2	3	2.6	1.75	2

3=strongly mapped, 2=moderately mapped, 1=slightly mapped

Learning Outcomes:

1. Hypertext Mark-up Language (HTML):

- 1.1 Introduction and Evolution of World Wide Web
- 1.2 Define Browser
- 1.3 List different types of browsers
- 1.4 Discuss the Applications of Web Designing
- 1.5 What is HTML State the advantages of HTML
- 1.6 Explain the Structure of an HTML Document
- 1.7 Describe the Standards of HTML

- 1.8 Explain about various Text Formatting Tags, Positioning Tags and List Tags
- 1.9 Explain about various Table Formatting Tags, Image Tags and Anchor tags
- 1.10 Explain about various Frames, Forms and Form Elements
- 1.11 Explain about Other Tags of HTML
- 1.12 What is CSS?
- 1.13 Explain about Styles and Style sheets with CSS
- 1.14 What is CSS Positioning?
- 1.15 Explain about Scripting Styles in CSS

2. SCRIPTING LANGUAGE:

- 2.1 Define JavaScript
- 2.2 syntaxes of JavaScript
 - 2.2.1 literals
 - 2.2.2 variables
 - 2.2.3 constants, comments
- 2.3 Explain various Operators used in JavaScript
 - 2.3.1 arithmetic
 - 2.3.2 string
 - 2.3.3 logical, bitwise
 - 2.3.4 assignment
- 2.4 Explain about Conditional Code in JavaScript
- 2.5 Explain about Loops in JavaScript
 - 2.5.1 for, for/in, for/of
 - 2.5.2 while, do/while
- 2.6 Explain Arrays in JavaScript
 - 2.6.1 Definition and declaration
 - 2.6.2 initialization, accessing
 - 2.6.3 array methods
- 2.7 Explain objects in JavaScript
 - 2.7.1 Definition and declaration
 - 2.7.2 initialization, accessing
 - 2.7.3 objects methods
- 2.8 Explain about Function
 - 2.8.1 definition of function
 - 2.8.2 syntax of function
 - 2.8.3 function invocation with return statement
- 2.9 What is Testing Type?

- 2.10 List the Reserved Words in JavaScript
- 2.11 Explain about Cookies
- 2.12 Explain about Dialog Box
- 2.13 Explain about Animation and Multimedia
- 2.14 Describe about Image Map

3. Dreamweaver Creative Cloud:

- 3.1 What is Workspace
- 3.2 Explain Documentation and Preference
- 3.3 Explain about Toolbar
- 3.4 Describe various components in Panel
- 3.5 Draw and explain Basic site Structure
- 3.6 Describe Naming Conventions
- 3.7 Defining a site Files and Folders
- 3.8 Write the procedure to Uploading Files
- 3.9 Explain about Browser's and Web Sites
- 3.10 Write the steps needed for Creating Web Page
- 3.11 Explain about Graphics for the web
- 3.12 Explain the steps to Importing HTML

4. Work Space and Visual Development:

- 4.1 Explain Web- Application Development
- 4.2 Define Photoshop Integration
- 4.3 Explain about Photoshop Dream weaver Workflows
- 4.4 Defining your site
- 4.5 Describe Page layout with table
- 4.6 Explain various Library temples
- 4.7 Define form
- 4.8 Define Data Managing
- 4.9 Describe about Text and Alignment
- 4.10 Explain the procedure to Adding effects
- 4.11 Explain the Optimizing Graphics for the web
- 4.12 Explain a procedure to Creating navigation Buttons
- 4.13 Write steps to maintaining web site
 - 4.13.1 Write the procedure to Importing HTML
 - 4.13.2 Write steps to Insert content, Inserting an email
 - 4.13.3 Explain Getting your site on web

5. Flash with Action Scripts:

- 5.1 Explain about Action Panel
- 5.2 Explain various Conditions
- 5.3 Explain various List loops
- 5.4 Write a procedure to Create a Hyperlink
- 5.5 Explain the procedure to Working with Movie Clips
- 5.6 Event Handling
 - 5.6.1 Definition
 - 5.6.2 Listing the basic event handlings
 - 5.6.3 Explain about the basic event handlings
- 5.7 Graphics and Animation
 - 5.7.1 Definitions
 - 5.7.2 Explain about Creating Button
 - 5.7.3 Explain about Button Animation
 - 5.7.4 Explain about Skeleton Animation
- 5.8 Explain about Games Developing

COURSE CONTENT

- 1. Hypertext Mark-up Language (HTML):** Introduction and Evolution of World Wide Web, Browsers, Applications of Web Designing, Introduction to HTML, Benefits of HTML, Structure of an HTML Document, HTML Standards. HTML TAGS - Text Formatting Tags, Positioning Tags, List Tags, Table Formatting Tags, Image Tags, Anchor tags, Frames, Forms and Form Elements, and Other HTML Tags. Introduction to CSS – Styles and Style sheets with CSS, CSS Positioning, Scripting Styles
- 2. SCRIPTING LANGUAGE:** Introduction to JavaScript - Syntax Basics- Operators-Conditional Code, Loops, Arrays, Objects- Functions- Testing Type- Reserved Words-Cookies- Dialog Box- Animation- Multimedia-Image Map-Browser's
- 3. Dreamweaver Creative Cloud:** Introduction- Workspace-Documentation and Preference-Toolbar- Panel- Basic sit Structure- Naming Conventions-Defining a site Files and Folders- Uploading Files- Browser's and Web Sites- Creating Web Page- Working with Graphic-Importing HTML-
- 4. Work Space and Visual Development:** Web- Application Development - Photoshop Integration - Photoshop Dream weaver Workflows- Defining your site-Page layout with table- Library temples- form and Data Managing-Working with Text and Alignment - Adding effects, Optimizing Graphics for the web, Creating navigation Buttons, maintaining web site - Importing HTML-Insert content, Inserting an email - Getting your site on web
- 5. : Flash with Action Scripts:** Working with Action Panel- Code- Conditions and Loops- Create a Hyperlink, Working with Movie Clips, Text- Basic Event Handlings- Programming for Graphics and Animation - Creating Button and Button Animation - Skeleton Animation - Games Developing

REFERENCE BOOKS

1. Designing with Web Standards, by Jeffrey Zeldman, New Riders,
1. UsabilityThe practice of simplicity, by JakobJensen, New Riders,

Blue print:

S.No.	Chapter/Unit title	No.of periods	Weightage Allocatd	Marks Wise Distribution of Weightage				Question wise Distribution of Weightage				CO's Mapped
				R	U	Ap	An	R	U	Ap	An	
1	HYPertext MARKUP LANGUAGE (HTML)	15	14	3	3	8	10	1	1	1	*	CO1
2	SCRIPTING LANGUAGE	15	14	3	3	8	10	1	1	1	*	CO1,CO2
3	DREAMWEAVER CREATIVE CLOUD	15	14		6	8	10		2	1	*	CO1,CO3
4	WORK SPACE AND VISUAL DEVELOPMENT	15	14	3	3	8	10	1	1	1	*	CO1,CO3,CO4
5	FLASH WITH ACTION SCRIPTS	15	14		6	8	10		2	1	*	CO5
	Total	75	70+10*	9	21	40	10	3	7	5	1	

Table specifying the scope of syllabus to be covered for unit tests

Unit Test	Learning outcomes to be covered
Unit test-1	From 1.1 to 3.6
Unit test-2	From 3.7 to 5.14

Diploma in 3D Animation and Graphics Engineering

SUB NAME : Web Designing

MODEL PAPER

UNIT TEST-1

SCHEME: C-20
MAX MARKS:40

SUB CODE: AG-404
TIME: 90Minutes

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PART-A

16Marks

- Instructions:** 1) Answer all questions
2) First question carries 4marks, and each question of remaining carries 3marks

1. A).are the HTML tags and elements the same thing? (True/False)
(CO1)
B) The element is positioned according to the normal flow of the document is called---- (CO1)
C) Which of the following is not a java script data type [] (CO2)
I) number II) string III) enum IV) boolean
D) ----- links are used to connect users to other pages within the same website [](CO3)
I) internal link II) external link III) basic email link IV) none
2. What are tags and attributes in HTML? (CO1)
3. [What are object prototypes?](#) (CO2)
4. [Explain Implicit Type Coercion in JavaScript.](#) (CO2)
5. **How do we insert a Table??** (CO3)

PART-B

3X8=24Marks

- Instructions:** 1) Answer all questions
2)Each question carries 8 Marks
3)Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer

6. a) Which HTML tag is used to display the data in the tabular form? (CO1)
Or
b) Explain the layout of HTML? (CO1)
7. a) List some of the advantages and disadvantages of JavaScript. (CO2)
Or
b) What is BOM (Browser Object Model)? (CO2)
8. a) Explain how you can perform validation in Dreamweaver?. (CO3)
Or
b) Explain how you can add an image to your web page in Dreamweaver? (CO3)

Board Diploma Examination
Model Question paper-End Exam
DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
SUB NAME: Web Designing

SCHEME:C-20
MAX MARKS:80

SUB CODE:AG-404
TIME: 3HOURS

Part-A

Answer All Questions each carries three marks 10X3=30

- | | |
|---|-----|
| 1. Define Tags in HTML | CO1 |
| 2. What is CSS? | CO1 |
| 3. List various data types in JavaScript. | CO2 |
| 4. Define cookies? | CO2 |
| 5. Define site files and folders. | CO3 |
| 6. List components in toolbar | CO3 |
| 7. What is Photoshop integration? | CO4 |
| 8. List different library templates. | CO4 |
| 9. What is event handling? | CO5 |
| 10. Define graphics and animation. | CO5 |

Part-B

Answer All Questions carries eight marks 5X8=40

- | | | |
|---|-----|-----|
| 11. (a) in how many ways can we specify the CSS styles for the HTML element?
(or)
(b) What are forms and how to create forms in HTML? | CO1 | |
| 12. (a) explain how to create an array in JavaScript?
(or)
(b) Explain various pop-up boxes available in JavaScript? | CO2 | CO2 |
| 13. (A) Explain how you can perform validation in Dreamweaver?
(Or)
(b) Explain how you can make your site live in Dreamweaver? | CO3 | CO3 |
| 14. (a) Explain about Photoshop dream weaver workflow with neat diagram.
(or)
(b) Explain about creating navigation buttons | CO4 | CO4 |
| 15. (a) explain about creating movie clips.
(or)
(b) Explain about creating button and button animation. | CO5 | CO5 |

Part-C

- Answer the following Question**
- | | |
|--|-----|
| 16. Design a website using Dreamweaver | CO3 |
|--|-----|

(1x10=10M)

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-405	3D lighting and Rendering Techniques	5	75	20	80

S.No.	Chapter/Unit Title	No.of Periods	CO's Mapped
1.	Basic Lighting Techniques	10	CO1
2.	Environment Lighting	15	CO2
3.	Mental ray Lighting Setup	10	CO3
4.	Mental ray Rendering Techniques	20	CO4
5.	V- Ray Lighting Work Flow	20	CO5
Total Periods		75	

Course Objectives	<ul style="list-style-type: none"> • To familiarize with basic lighting techniques • To understand environment lighting. • To familiarize with mental ray lighting setup • To understand mental ray rendering techniques. • To understand v ray lighting work flow.
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Course Outcomes	At the end of the course the student will be able to		
	CO1	AG-405.1	Demonstrates various basic lighting techniques
	CO2	AG-405.2	Apply different environment lighting Techniques
	CO3	AG-405.3	Describe mental ray lighting setup
	CO4	AG-405.4	Apply different mental ray rendering techniques
	CO5	AG-405.5	Describe V- ray lighting work flow

CO-PO/PSO Matrix:

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
AG-403.1	3				1	1		3		1
AG-403.2	2	2	2	1			1	1	3	1
AG-403.3	2	1	2	1	1	1	1	2	1	1
AG-403.4	1	2		1		3	1	2	1	2
AG-403.5	2		2	2	1	1	1	2	1	2

Average	2	1.6	2	1.25	1	1.5	1	2	1.5	1.4
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3=Strongly mapped , 2=moderately mapped, 1=slightly mapped

Learning Outcomes:

1.0 BASIC LIGHTINGTECHNIQUES

- 1.1. Explain about Maya Lights.
- 1.2. State the Art of Lighting.
- 1.3. Explain Common Light Attributes.
- 1.4. Explain the various types of Light.
 - 1.4.1. Ambient Light
 - 1.4.2. Directional Light
 - 1.4.3. Point Light
 - 1.4.4. Spot Light
 - 1.4.5. Volume Light
- 1.5. Describe about Light Menus.
- 1.6. Explain the steps to working on Light Decay.
- 1.7. Explain Lighting Placement concept.
- 1.8. State the need of Key in lighting techniques.
- 1.9. Explain the process of Fill in lighting techniques.
- 1.10. Explain about Rim Lights.
- 1.11. Describe about Positioning Lights.
- 1.12. Explain Light Connections with examples.
- 1.13. Explain about Negative Lights with examples.

2.0 ENVIRONMENT LIGHTING

- 2.1. Introduction to Light Setup environment lighting.
- 2.2. Explain the concept of Exterior Light Setup with examples.
- 2.3. Explain the concept of Interior Light Setup with examples.
- 2.4. Explain the concept of 3Point Lighting Setup with examples.
- 2.5. Describe Light Linking in environment lighting.
- 2.6. Describe Shadow Linking in environment lighting.
- 2.7. Compare Light Linking and Shadow Linking techniques.
- 2.8. Explain the concept of Light fog.
- 2.9. Explain theconcept of Light Glow.
- 2.10. Explain about Depth Map Shadow in environment lighting.
- 2.11. Explain about Ray Trace Shadow in environment lighting.
- 2.12. Describes about Environment &Volume Fogs techniques with examples.
- 2.13. Explain about Camera Settings.
- 2.14. Explain the concept of Depth of Field.
- 2.15. Mention about Motion Blur.
- 2.16. Explain about the Production Quality.
- 2.17. Explain the steps to create Sun Direction Light.
- 2.18. Describe the concept Render Global in environment lighting.
- 2.19. Explain Software Rendering in environment lighting.

- 2.20. Explain about IPR Rendering.
- 2.21. Explain briefly about Ray Trace Setting.

3.0 MENTAL RAY LIGHTING SETUP

- 3.1. State the purpose of Mental Ray lighting.
- 3.2. Explain the concept of Global Illumination.
- 3.3. Explain the concept of Indirect Illumination
- 3.4. Describes Final Gather in Mental Ray lighting.
- 3.5. State the purpose of Caustics concept.
- 3.6. Explain about Caustics Workflow in Mental Ray lighting.
- 3.7. Explain the working procedure on Caustics Photon.
- 3.8. Explain about Photon Color & Intensity.
- 3.9. Describe the concept of Exponent Photon Counts & Radius in Mental Ray lighting.
- 3.10. Explain about Accuracy in Mental Ray lighting.
- 3.11. Explain about Caustic Filter Type.
- 3.12. Describe the concept of Caustic Photon Map in Mental Ray lighting.
- 3.13. Explain Photon Tracing concept.
- 3.14. Explain about Caustic File.
- 3.15. Describe Map Visualizes in Mental Ray lighting.
- 3.16. Explain about Diagnose Photon in Mental Ray lighting.

4.0 MENTAL RAY RENDERING TECHNIQUES

- 4.1. Explain about Batch Rendering techniques.
- 4.2. Describe the usage of 'F' check in Mental Ray rendering.
- 4.3. Explain about Render Passes.
- 4.4. Describe the concept Render Layers.
- 4.5. State the purpose of HDRI lightings.
- 4.6. Describe Mental Ray Nodes.
- 4.7. Describe Mental Ray Shaders.
- 4.8. Explain Image Based Lighting with examples.
- 4.9. Mention the steps to simulate Sun & Sky Setup.
- 4.10. Explain about Physical Sun in mental ray rendering.
- 4.11. Explain about Physical Sky in mental ray rendering.
- 4.12. State the need of Mia in mental ray rendering.
- 4.13. Explain about Mia Exposure with examples.
- 4.14. Describe Mental Ray Shadow Map with examples.
- 4.15. Explain about the HDRI Setup.

5.0 V- RAY LIGHTING WORK FLOW

- 5.1. Explain the types of V-ray Lights.
- 5.2. Mention the steps to V-ray setting.
- 5.3. Mention the steps to Shadow setting.
- 5.4. Mention the steps to GI Setup.
- 5.5. Define Photon Emission and give examples.
- 5.6. Describes the Advance Options in V-Ray lighting.
- 5.7. Explain about Render Elements in V-Ray lighting.
- 5.8. Explain the Gamma Corrections in V-Ray lighting.

- 5.9. Describe about Bright Multiplier in V-Ray lighting.
- 5.10. Illustrates Camera Work Flow in V-Ray lighting.
- 5.11. Explain Environmental Fog.
- 5.12. Describe DMC Sampler concept in V-Ray lighting.
- 5.13. Explain Indirect Illumination with examples.
- 5.14. State about the Render Setting in V-Ray lighting.
- 5.15. State the importance of Render Elements in V-Ray lighting.
- 5.16. Explain about V-ray Blend Materials with examples.
- 5.17. Describe V-ray CARPAINT in V-Ray lighting.
- 5.18. Describe about V-ray Light Materials.
- 5.19. State the need of V-ray Material Wrapper.
- 5.20. Explain about V-ray Bump Materials with examples.
- 5.21. Explain about Double Side Materials with examples.
- 5.22. Explain V-ray SSS Shader in V-Ray lighting.
- 5.23. Explain V-ray Skin Shader in V-Ray lighting.
- 5.24. State the purpose of V-ray Rendering.

COURSE CONTENT

- 1. Basic lighting techniques** – Maya Lights – Art of Lighting - Common Light Attributes – Types of Light – Ambient Light – Directional Light – Point Light – Spot Light – Volume Light - Light Menus – Working on Decay – Lighting Placement –Key, Fill, Rim Lights – Positioning Lights – Light Connections – Negative Lights
- 2. Environment lighting** – Exterior Light Setup – Interior Lighting –3Point Lighting Setup –Light Linking – Shadow Linking – using Light fog – Light Glow - Depth Map Shadow – Ray Trace Shadow – Environment &Volume Fogs – Camera Settings – Depth of Field – Motion Blur – Production Quality– Create Sun Direction Light Scene – Render Global - Software Rendering – IPR Rendering – Ray Trace Setting
- 3. Mental Ray lighting setup** - Mental Ray lighting– Global Illumination – Indirect Illumination- Final Gather – Caustics - Caustics Workflow — Working on Caustics Photon – Photon Color & Intensity – Exponent Photon Counts & Radius – Accuracy – Caustic Filter Type – Caustic Photon Map – Photon Tracing – Caustic File – Map Visualizes – Diagnose Photon
- 4. Mental Ray rendering techniques** - Batch Rendering – usage of ‘F’ check - Render Passes – Render Layers – HDRI lightings – Mental Ray Nodes– Mental Ray Shaders – Image Based Lighting – Simulate Sun & Sky Setup –Physical Sun –Physical Sky – Mia – Mia Exposure – Mental Ray Shadow Map–HDRI Setup
- 5. V-Ray lighting work flow** :Types of V-ray Lights – V-ray Setting – Shadow Setting – GI Setup – Photon Emission – Advance Options – Render Elements – Gamma

Corrections – Bright Multiplier – Camera Work Flow – Environmental Fog – DMC Sampler – Indirect Illumination – Render Setting – Render Elements- V-ray Blend Materials – V-ray CARPAINT – V-ray Light Materials – V-ray Material Wrapper – V-ray Bump Materials – Double Side Materials – V-ray SSS Shader – V-ray Skin Shader – V-ray Rendering

REFERENCE BOOKS

1. Mastering Maya Aerickeller Wiley India PvtLtd . 2009 - First Edition
2. Autodesk Maya Techniques Marc – André iguanodon neo reel Autodesk media Entertainment 2008 First Edition
3. Maya with Photoshop Daniel gray BPB Publications 2007- First Edition

Model Blue Print:

S.No	Chapter/Unit title	No.of periods	Weightage Allocated	Marks Wise Distribution of Weightage				Question wise Distribution of Weightage				CO's Mapped
				R	U	A p	A n	R	U	A p	A n	
1	Basic Lighting Techniques	10	11	3	8			1	1			CO1
2	Environment Lighting	15	14	3	3	8	10	1	1	1	*	CO2
3	Mental ray Lighting Setup	10	11	3		8		1		1		CO3
4	Mental ray Rendering Techniques	20	17	6	11		10	2	2		*	CO4
5	V - Ray Lighting Work Flow	20	17	6	3	8	10	2	1	1		CO5
	Total	75	70 + 10(*)					7	5	3		

Note: Part-C: 10 marks single analytical question may be chosen from any or combination of starred chapters

Table specifying the scope of syllabus to be covered for unit tests

Unit Test	Learning outcomes to be covered
Unit test-1	From 1.1 to 3.16

Unit test-2	From 4.1 to 5.24
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**DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
MODEL PAPER
3D LIGHTING AND RENDERING TECHNIQUES
UNIT TEST-1
SCHEME: C-20SUBJ CODE:AG-405**

MAX MARKS:40

TIME: 90Minutes

PART-A

16Marks

Instructions: 1) Answer all questions
2) First question carries 4marks, and each question of remaining carries 3marks.

1. a) Light decay is nothing but the reduced lighting part in intensity of original light.(True/False) (CO1)
- b) In rendering techniques, IPR stands for ----- (CO2)
- c) The energy of photon is directly proportional to _____ of light. (CO3)
- d) Which one of the following is a type of Light [] (CO1)
 - I) Ambient Light II) Point Light III) Spare Light IV) Spot Light
- 2) List any three Light Menus. (CO1)
- 3) Write the differences between Light Linking and Shadow Linking. (CO2)
- 4) What do you mean by Production Quality in environment light? (CO2)
- 5) Define Accuracy in metal ray lighting. (CO3)

PART-B

3X8=24Marks

Instructions:1) Answer all questions
2) Each question carries 8 Marks

3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

6. a) List and explain the types of Light in detail. (CO1)

Or

b) Explain the concept of Negative Lights with examples. (CO1)

7. a) Explain the concept of Exterior Light Setup with examples. (CO2)

Or

b) Explain the concept of Light fog and Light Glow. (CO2)

8. a) Explain about Global Illumination in Mental Ray lighting. (CO3)

Or

b) Explain Photon tracing in mental ray lighting. (CO3)

BOARD DIPLOMA EXAMINATIONS
DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
MODEL PAPER – YEAR END EXAMINATION
3D LIGHTING AND RENDERING TECHNIQUES
SCHEME: C-20 SUBJ CODE:AG-405

MAX MARKS:80

TIME: 3HOURS

PART-A10X3=30Marks

Note: Answer all questions

1. Write briefly about Light attributes. (CO1)

2. Write the differences between Light Linking and Shadow Linking techniques. (CO2)

3. Explain briefly about Light fog. (CO2)

4. Define Accuracy in mental ray lighting. (CO3)

5. Write about Mental Ray Nodes. (CO4)

6. What is Image based lighting and give example. (CO4)

7. Write the steps to HDRI Setup in mental ray rendering. (CO4)

8. Define Photon Emission. (CO5)

9. Mention Render elements in V-Ray lighting. (CO5)

10. Compare V-ray SSS Shader and V-ray Skin Shader. (CO5)

PART-B

5x8=40Marks

Note: Answer all questions

11. A. Explain different types of Light. (CO1)

OR

B. Explain the steps of working Light Decay in lighting. (CO1)

12. A. Explain about Depth Map Shadow in environment lighting. (CO2)

OR

B. Explain the concept of Interior Light Setup with examples. (CO2)

13. A. Explain about Photon Color & Intensity. (CO3)

OR

B. Explain the concept of Global Illumination in Mental Ray lighting. (CO3)

14. A. Describe Mental Ray Shadow Map with examples. (CO4)

OR

B. Write the differences between Physical Sun and Physical Sky techniques. (CO4)

15. A. Explain the Gamma Corrections in V-Ray lighting. (CO5)

OR

B. Write the differences between V-ray Bump Material and Double Side Material in V-Ray Lighting. (CO5)

PART-C

1X10=10Marks

16. Explain the concept of 3Point Lighting Setup with examples. (CO2)

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-406	3D Modelling and Texturing Lab	3	45	40	60

Required Infrastructure(Software, Hardware and other Equipment) to be procured as per C-20:

SNO	Hardware / Equipment Needed	Software Needed
1	<p>Desktop Systems:</p> <p>Configuration:</p> <p>25. Processor :: AMD Ryzen 9 3900X Or any other equivalent intel/Motorola etc.. processor or Above</p> <p>26. Mother Board: AMD 400/500 or its equivalent or above</p> <p>27. RAM: 8GB(or above) dual channel DDR4</p> <p>28. HDD: 500GM (SSD)/1TB(or above)</p> <p>29. Graphics Card: Aorus GeForce RTX 2080 Ti</p>	<p>1. Operating System: Microsoft Windows 10 professional-64 bit (Minimum)</p> <p>2.Animation and Graphics Software</p> <p>j. Adobe master collection cs6 (or Above)</p> <p>k. Autodesk MAYA</p> <p>l. Autodesk 3DS MAX.</p>

	Xtreme (or equivalent) 30. Monitor: 17" or above 31. Multimedia Devices like Mic, Head Phones / Speakers , USB Web camera or USB Digital Video Camera 32. Color Photo Scanner and Printer	
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S No	Chapter/ Unit Title	No. of Periods	COs Mapped
1.	Maya Interface & Workflow	6	CO1
2.	Low Polygon Modelling Techniques	9	CO2
3.	Advance Modelling Techniques	9	CO3
4.	Texturing Work Flow	12	CO4
5.	Advance Texturing Techniques	9	CO5
	Total	45	

COURSE OBJECTIVES	<p>Upon completion of the course the student shall be able to</p> <ol style="list-style-type: none"> 11. Installation of MAYA software. 12. Practice all menus in MAYA layout and exercise various options like Time slider, Range slider, Import and Export options ... etc. 13. Install and practice Component Selection, Editing, Split, Bevel, Chamfers, Split and Sculpt geometry tools. 14. Draw various model sheets in Front and Side views. 15. Describe Basic Shapes Making and draw Low Resolution Model. 16. Install and draw various polygon editing tools in 3D. 17. Practice to draw Ear, Inner Mouth, Teeth, Tongue, Inner Eye and Polygon Hair 18. Practice different mappings like Projection Mapping, Stencil Mapping, Label Mapping, Bump Mapping, ... etc. 19. Practice various Depth Coloring Techniques update With Maya 20. Install Spotlight Tools and and develop Spotlight Techniques
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CO No		COURSE OUTCOMES
CO 1	AG-406.1	Installing MAYA tools and practice various options in Maya layout
CO 2	AG-406.2	Develop a Simple Model (including Logos) according to your ideology by using various polygon modelling techniques.
CO 3	AG-406.3	Draw various models like Ear, Inner Mouth, Teeth, Tongue, Inner Eye and Polygon Hair, Male Head, Female Head, Child – Old Man, Realistic Head and Cartoon Head.
CO 4	AG-406.4	Practice different Painting Techniques with PSD Network
CO 5	AG-406.5	Develop various advance texturing techniques like UV Snap Shot and Texturing ,Skin tone and brush,Depth Coloring Techniques, spotlight, ..., etc.

CO-PO/PSO MATRIX

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
AG-406.1	2	2		1	1			1		
AG-406.2		1	3	2	3	1	2		2	2
AG-406.3				1	2	3		1		3
AG-406.4	2	2	3		3		2		2	
AG-406.5	2			2		1	2	1		2
Average	2	1.6	3	1.5	2.4	1.6	2	1	2	2.3

3=Strongly mapped , 2=moderately mapped, 1=slightly mapped

LEARNING OUTCOMES:

1. Practice Menu bar, Status bar in MAYA layout.
2. Exercise on different Maya layout options like Export option, Import option, play back options, .., etc.
3. Practice various Curve Editing Tools.
4. Draw the NURBS Surfaces.
5. Practice various polygon tools like Split, Bevel, Sculpt Geometry, ..., etc.
6. Develop Logos for various examples like your college, branch, city... etc.using various polygon modelling techniques.
7. Develop a Simple Model according to your ideology by using various polygon modelling techniques.
8. Prepare Model Sheet to any image in Front View and Side View.
9. Practice to making Basic Shapes of any image in 2D.
10. Draw various human body Parts like Arms, Legs, Fingers & Toe in 3D.
11. Draw the picture of Male Head, Female Head and Child – Old Man in 3D.
12. Draw the picture of any bird's Realistic Head and Cartoon Head in 3D.
13. Practice various images using different Mapping Methods.

14. Texture the given exterior model with PSD network
15. Exercise on how to create UV Files.
16. Draw an animal image by using various painting techniques.
17. Practice how to exporting Mesh.
18. Create any image by using Displacement Mapping.
19. Texture human face model with given texture reference image.
20. Texture the given character with z brush spot light using normal & diffuse maps.

The competencies and key competencies to be achieved by the student

S.No.	Name of the Experiment	Objectives	Key Competencies
1	Practice Menu bar, Status bar in MAYA layout.	Identify the different options in Menu bar, Status bar of MAYA layout	<ul style="list-style-type: none"> ❖ Identify the different options in Menu bar, Status bar ❖ Differentiate various options in menu bar and status bar in MAYA layout
2	Exercise on different Maya layout options like Export option, Import option, play back options, ..., etc.	Identify the various options in Maya layout	<ul style="list-style-type: none"> ❖ Identify different MAYA layout options ❖ Know the purpose of each option ❖ Practice all options in layout
3	Practice various Curve Editing Tools.	Showing the various Curve Editing Tools	<ul style="list-style-type: none"> ❖ Know the Curve Editing Tools ❖ Install available curve editing tools ❖ Practice curve editing techniques
4	Draw the NURBS Surfaces	Identify different measurements to draw NURBS surface	<ul style="list-style-type: none"> ❖ Identify the NURBS Boolean values ❖ Draw NURBS Surfaces ❖ Practice on that surface with different measurements
5	Practice various polygon tools like Split, Bevel, Sculpt Geometry, ..., etc.	Identify different polygon tools available and Install that polygon tools	<ul style="list-style-type: none"> ❖ Installation of Split, Bevel, Sculpt Geometry, ... , etc. Polygon tools. ❖ Practice different tools with various examples
6	Develop Logos and Simple Models according to your ideology	Know the techniques used to draw Logos Identify various Models	<ul style="list-style-type: none"> ❖ Know about various polygon modelling techniques. ❖ Identify different Logos ❖ Develop various models

	by using various polygon modelling techniques.		
7	Prepare Model Sheet to any image in Front View and Side View.	Identify the elements of Model Sheet in 2D	<ul style="list-style-type: none"> ❖ Prepare Model sheet in 2D ❖ Know different views like Front view and Side view in 2D ❖ Practice any image in Front view and Side view
8	Practice to making Basic Shapes of any image in 2D.	Identify the various basic shapes of image in 2D	<ul style="list-style-type: none"> ❖ Know the basic shapes in 2D ❖ Draw any image basic shapes in 2D
9	Draw various Body Parts like Arms, Legs, Fingers & Toe, Male Head, Female Head, Child – Old Man, Realistic Head and Cartoon Head in 3D.	Identify various tools to draw any image in 3D	<ul style="list-style-type: none"> ❖ Know different tools used to draw any image in 3D ❖ Draw different images like Arms, Legs, and Fingers & Toe. ❖ Draw Male Head, Female Head, Child – Old Man. ❖ Draw Realistic Head and Cartoon Head ❖ Compare all images
10	Practice various images using different Mapping Methods and Texture the given exterior model with PSD network	Identify different Mapping Methods and different texture models in PSD network	<ul style="list-style-type: none"> ❖ Know different Mapping Methods ❖ Know about PSD network ❖ Identify different models in PSD network ❖ Create PSD network ❖ Practice on PSD network in texturing
11	Exercise on how to create UV Files.	Identify UV file options	<ul style="list-style-type: none"> ❖ Know various UV editing tools ❖ Install UV editing tools ❖ Exercise to create UV file ❖ Practice on various UV file options
12	Draw an animal image by using	Know the different painting techniques	<ul style="list-style-type: none"> ❖ Identify various painting techniques ❖ Compare different painting techniques

	various painting techniques.		❖ Paint different animal images using various Brushes
13	Practice how to exporting Mesh	Identify Mesh concept in advance texturing technique	<ul style="list-style-type: none"> ❖ Know about Mesh concept ❖ Develop mesh in texturing ❖ Exercise export option in Mesh method
14	Create any image by using Displacement Mapping.	Identify Displacement Mapping concept in advance texturing technique	<ul style="list-style-type: none"> ❖ Know about Displacement Mapping concept ❖ Create any image by using Displacement Mapping ❖ Practice with different images
15	Texture human face model with given texture reference image	Identify different models and draw that model	<ul style="list-style-type: none"> ❖ Know various models in texturing ❖ Draw different models ❖ Compare different models
16	Texture the given character with z brush spot light using normal & diffuse maps	Identify different maps and practice to Z –brush that images	<ul style="list-style-type: none"> ❖ Know normal & diffuse maps in texturing ❖ Practice Z- brush spotlight using various maps in texturing ❖ Draw different images

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AM-407	Digital Photography Lab	3	45	40	60

GUIDE LINES:

- ☐ All the exercises provided in the list of practical's should be completed and submitted during the semester examination.
- ☐ In order to develop skill in mastering creativity, every student should be made to practice thoroughly.
- ☐ The external examiners are requested to ensure that a single practical oriented question should not be given to more than three students while admitting a batch of 30 students during Board Examination.

S No	Chapter/ Unit Title	No. of Periods	COs Mapped
1.	BASIC OF PHOTOGRAPHY	5	CO1
2.	DIGITAL PHOTOGRAPHY	10	CO1,CO2,CO3
3.	IMAGE COMPOSITION	10	CO1,CO2,CO3
4.	DIGITAL IMAGING&PHOTOGRAPHY	20	CO1,CO2,CO3,CO4,CO5
	Total	45	

Course Objectives	<ul style="list-style-type: none"> • Perform Camera Mechanism and Handling various equipment in digital photography • Applying lighting techniques in handling various photo shoots along with projecting various styles in photo graphic • Designing various images in various formats • Applying Digital color correction &grading • Perform Printing & sharing photos.
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CO No	COURSE OUTCOMES	
CO1	AM-407.1.	Analysing basic principles of Photography
CO2	AM-407.2	Practicing Digital camera Functions.
CO3	AM-407.3	Applying various image composing techniques.
CO4	AM-407.4	Applying digital imaging principles
CO5	AM-407.5	Practicing industrial Applications of photography techniques and documentation.

CO-PO/PSO MATRIX

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
AM-407.1	2	2		2			3	2	2	
AM-407.2	2		2	2	2		3	3	2	
AM-407.3	2	2	3	2		3	2	3	2	
AM-407.4	2		3	2		2	2	3	3	1
AM-407.5	2			2	2	2	3	3	3	1
average	2	2	2.6	2	2	2.3	2.6	2.8	2.4	1

3=Strongly mapped , 2=moderately mapped, 1=slightly mapped

LIST OF PRACTICAL EXERCISES

1. Take shots of a Landscape exterior in different angles.
2. Create Portrait Photography.
3. Create Food Photography
4. Create your own visual story Photography
5. Create your silhouette Photography
6. Create macro Photography
7. Create your creative Photography
8. Create your special effects Photography
9. Create Photography album
10. Create Milky Way photography
11. Create Pet photography
12. Create sea space Photography
13. Create wildlife photography

The competencies and key competencies to be achieved by the student

S.N o.	Name of the experiment	Objectives	Key Competencies
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Communication Skills

Course Code	Course Title	No. of Periods/Week	Total No. of Periods	Marks for FA	Marks for SA
Common 408	Communication Skills	3	45	40	60

S. No.	Unit Title	No of Periods	COs Mapped
1	Listening Skills	6	CO1
2	Introducing Oneself	3	CO1, CO2, CO3
3	Short Presentation (JAM)	6	CO1, CO2, CO3
4	Group Discussion	6	CO1, CO2, CO3
5	Preparing Resume with Cover Letter	3	CO3
6	Interview Skills	9	CO1, CO2, CO3
7	Presentation Skills	9	CO1, CO2
8	Work place Etiquette	3	CO1, CO2
Total Periods		45	

Course Objectives	To comprehend the features of communication needed for professional success and display the use of these competently
	To present ideas, opinions in group discussions and presentations on topics of general and technical interest
	To prepare for job selection processes

CO No.	Course Outcomes
CO1	Interacts in academic and social situations by comprehending what is listened to when others speak.
CO2	Demonstrates effective English communication skills while presenting ideas, opinions in group discussions and presentations on topics of general and technical interest
CO3	Exhibits workplace etiquette relevant in classroom situations for easy adaptation in professional setting in the future

CO-PO Matrix

Course Code Common-408	Course Title: English Number of Course Outcomes: 4			No. of Periods: 45	
POs	Mapped with CO No.	CO Periods Addressing PO in Column 1		Level of Mapping (1,2,3)	Remarks
		Number	Percentage %		
PO1		Not directly applicable for Communication Skills Course however interactive activities that use content from science and technology relevant to the Programme taken up by the student shall be exploited for communication in the Course.			
PO2					
PO3					
PO4					
PO5	CO1, CO2, CO3	11	25%		>60%: Level 3
PO6	CO1, CO2, CO3	27	60%		16 -59%: Level 2
PO7	CO1, CO2, CO3	7	15%		Up to 15%: Level 1

Level 3 – Strongly Mapped

Level 2- Moderately Mapped

Level 1- Slightly Mapped

Mapping Course Outcomes with Program Outcomes:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
CO 1					✓	✓	✓
CO 2					✓	✓	✓
CO3					✓	✓	✓

Blue Print for evaluation based on Course Outcomes for SA:

Note: Every Question based on CO has to be given marks for the following parameters of communication in the rubric.

- Fluency and Coherence
- Lexical Resource (Vocabulary)
- Grammatical Range and Accuracy

***Rubric Descriptors 'Good/ Competent / Fair /Poor' for Communication**

LEVEL OF COMPETENCE	Fluency and Coherence	Lexical Resource (Vocabulary)	Grammatical Range and Accuracy
GOOD (9-10*)	Speaks at length without noticeable effort or loss of coherence. May demonstrate language-related hesitation at times, or some repetition and/or self-correction.	Uses vocabulary resources flexibly during discussion. Uses paraphrase effectively.	Uses a range of complex structures with some flexibility.
	Uses a range of connectives and discourse markers with some flexibility. Articulates and adapts to near naturalization.	Uses some less common vocabulary and shows some awareness of style and collocation	Mostly produces error-free sentences.
COMPETENT (6-8)	Is willing to speak at length, though may lose coherence at times due to occasional repetition, self-correction or hesitation.	Has enough vocabulary to discuss topics and make meaning clear in spite of inappropriacies.	Uses a mix of simple and complex structures, but with limited flexibility.
	Uses a range of connectives and discourse markers but not always appropriately.	Generally paraphrases successfully	May make mistakes with complex structures though these rarely cause comprehension problems.
FAIR (3-5)	Tries to maintain a flow of speech but t uses repetition, self correction and/or slow speech to keep going.	Manages to talk about familiar and unfamiliar topics but uses vocabulary with limited flexibility.	Produces only basic sentence forms, however, errors persist.
	Produces simple speech fluently, but more complex communication causes fluency problems.	Attempts to use paraphrase but with mixed success.	Uses a limited range of more complex structures, but these usually contain errors and may cause some comprehension problems

POOR (0*-2)	Speaks with long pauses. Pauses lengthy before most words. Merely imitates	Uses simple vocabulary to convey personal information	Attempts basic sentence forms but with limited success, or relies on apparently memorized utterances
	Has limited ability to link simple sentences	Has insufficient vocabulary for less familiar topics	Makes numerous errors except in memorized expressions
	Gives only simple responses and is frequently unable to convey basic message	Only produces isolated words or memorized utterances	Struggles to produce basic sentence forms

s*10 marks to be awarded only if competence level shows flawless expertise in English.

***0 marks to be awarded when student shows incoherence and gives irrelevant responses.**

Blue Print for evaluation based on Course Outcomes for SA of each student:

Note: Marks are awarded for each student as per the Rubric descriptors.

S. No.	Questions based on Course Outcomes	Periods Allocated for practice	Marks Wise Distribution of	Marks allotment for each Student in the Rubric*				Mapping of COs
				Poor 0-2	Fair 3-5	Competent 6-8	Good 9-10	

		al work	Weightage					
1	Describe the given object in a minute	6	10					CO 2
2	Exchange ideas/ views in a group discussion on _____ issue (academic, technical or social)	6	10					CO1, CO 2
3	Present your ideas /opinions on the given issue/ topic (individual to an audience)	9	10					CO1, CO2, CO 3
4	Role play an imaginary work-place situation	6	10					CO1, CO2, CO 3
5	Individual interaction with the Examiner duly submitting Resume (Facing the Interview) – Introducing oneself and answering questions	12	10					CO1, CO2, CO 3
6	*Listen to and comprehend any audio communication/ content	6	10					CO1, CO2, CO 3
TOTAL		45	60					

***Listen to and comprehend the given audio content:** Giving the Students time to read the questions (Fill in the Blanks, Select from Alternatives, True or False, Table fill, etc.) in chunks before listening to audio inputs also played in chunks.

Blue Print for evaluation based on Course Outcomes for Formative Assessment:

Note: Every Question based on CO has to be given marks for the following parameters in the rubric.

- Fluency and Coherence
- Lexical Resource
- Grammatical Range and Accuracy

S. No.	Questions based on Course Outcomes	Periods Allocated for practical work	Marks Wise Distribution of Weightage	Marks allotment for each Student in the Rubric*				Mapping of COs
				Poor 0-2	Fair 3-5	Competent 6-8	Good 9-10	
Formative Assessment - 1								
1	Describe the given object in a minute	3	10					CO 2
2	Exchange ideas/ views in a group discussion on _____ issue (academic, technical or social)	6	10					CO1, CO 2
3	Present your ideas /opinions on the given issue/ topic (individual to an audience)	6	10					CO1, CO2, CO 3
4	*Listen to and comprehend any audio communication/ content	3	10					CO1, CO2, CO 3
Total		18	40					
Formative Assessment - 2								
1	Present your ideas /opinions on the given issue/ topic (individual to an audience)	3	10					
2	Role play an imaginary workplace situation	6	10					CO1, CO2, CO 3
3	Individual interaction with the Examiner duly submitting Resume (Facing the Interview) – Introducing oneself and answering questions	15	10					CO1, CO2, CO 3
4	*Listen to and comprehend any audio communication/	3	10					CO1, CO2, CO 3

	content							
TOTAL		27	40					

Learning Outcomes

1. Listening Skills:

- 1.1 Listen to audio content (dialogues, interactions, speeches, short presentations) and answer questions based on them
- 1.2 Infer meanings of words / phrases / sentences / after listening to audio content as mentioned above

2. Introducing Oneself:

- 2.1 Prepare a grid different aspects for presentation about a person / oneself
- 2.2 Present a 1 or 2 minute introduction of oneself for an audience

3. Short Presentation:

- 3.1 Define an object
- 3.2 Describe an object, phenomenon, event, people
- 3.3 Speak on a topic randomly chosen

4. Group Discussion:

- 4.1 Practice Group Discussion. Techniques
- 4.2 Participate in group discussions

5. Resume Writing and Cover Letter:

- 5.1 Prepare resumes of different sorts – one’s own and others.
- 5.2 Write an effective cover letter that goes with a resume

6. Interview Skills:

- 6.1 Prepare a good Curriculum Vitae
- 6.2 Exhibit acceptable (Greeting, Thanking, Answering questions with confidence)

7. Presentation Skills:

- 7.1 Prepare Posters, Charts, PPT’s on issue of general and technical interest
- 7.2 Present one’s ideas before an audience with confidence using audio visual aids and answer questions that are raised.

8. Workplace Etiquette:

- 8.1 Show positive attitude & adaptability / appropriate body language to suit the work place
- 8.2 Display basic of etiquette like politeness, good manners.

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-409	3D Lighting and Rendering Techniques Lab	3	45	40	60

Required Infrastructure(Software, Hardware and other Equipment) to be procured as per C-20:

SNO	Hardware / Equipment Needed	Software Needed
1	<p>Desktop Systems:</p> <p>Configuration:</p> <ol style="list-style-type: none"> 1. Processor :: AMD Ryzen 9 3900X Or any other equivalent intel/Motorola etc.. processor or Above 2. Mother Board: AMD 400/500 or its equivalent or above 3. RAM: 8GB(or above) dual channel DDR4 4. HDD: 500GM (SSD)/1TB(or above) 5. Graphics Card: Aorus GeForce RTX 2080 Ti Xtreme (or equivalent) 6. Monitor: 17" or above 7. Multimedia Devices like Mic, Head Phones / Speakers , USB Web camera or USB Digital Video Camera 8. Color Photo Scanner and Printer 	<p>1. Operating System: Microsoft Windows 10 professional-64 bit (Minimum)</p> <p>2.Animation and Graphics Software</p> <ol style="list-style-type: none"> m. Adobe master collection cs6 (or Above) n. Autodesk MAYA o. Autodesk 3DS MAX.

S No	Chapter/ Unit Title	No. of Periods	COs Mapped
1.	Basic Lighting Techniques	6	CO1
2.	Environment Lighting	9	CO2
3.	Mental ray Lighting Setup	9	CO3

4.	Mental ray Rendering Techniques	12	CO4
5.	V ray Lighting Work Flow	9	CO5
	Total	45	

COURSE OBJECTIVES	<p>Upon completion of the course the student shall be able to</p> <p>9. Introduction to MAYA Lights</p> <p>10. Know the different light attributes.</p> <p>11. Practice various Light menus.</p> <p>12. Explain the various types of Light setup in environment lighting.</p> <p>13. Describe the Light linking techniques.</p> <p>14. Check the Production Quality in lighting</p> <p>15. Introduction to Mental Ray lighting concept</p> <p>16. Discuss various techniques involved in Mental Ray lighting</p> <p>17. Practice different mental ray rendering techniques.</p> <p>18. Explain the different types of V-ray Lights</p> <p>19. Describes the concepts like Render elements, Gamma corrections, Different materials, , etc. In V-Ray lighting.</p>
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CO No		COURSE OUTCOMES
CO 1	AG-409.1	Illustrates how to working with different types of light
CO 2	AG-409.2	Develop different types of light setup models in environment lighting
CO 3	AG-409.3	Develop mental ray lighting setup
CO 4	AG-409.4	Practice different mental ray rendering Techniques

CO 5	AG-409.5	Demonstrates the concept of V-Ray lighting work flow
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CO-PO/PSO MATRIX

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
AG-409.1	2	2	1	1		1		1	1	
AG-409.2	1	1	3		3	1	2			2
AG-409.3		2		1		3	1	1	1	3
AG-409.4	1	2		1	3		2	1	2	2
AG-409.5			3	2			1			2
Average	1.3	1.7	2.3	1.25	3	1.6	1.5	1	1.3	2.25

3=Strongly mapped , 2=moderately mapped, 1=slightly mapped

LEARNING OUTCOMES:

1. Practice on any image by changing common light attributes.
2. Exercise on various light menus and options.
3. Practice on different types of lights.
4. Demonstrates the Positioning Lights by taking an image
5. Light The Interior Scene Using Software Render for any image
6. Light The Exterior Scene Using Software Render for any image
7. Light The Given 3d Scene With Caustics And Final Gather
8. Practice how to create Sun Direction Light Scene to an image
9. Demonstrates the Camera Settings and Ray Trace Setting
10. Light The Scene With Direct Illumination Using Skylight System
11. Light The Interior With Global Illumination And Final Gather
12. Practice on Photon Color & Intensity with different measurements
13. Render The Interior Set In Layer Render Techniques Using Mental Ray Render
14. Exercise on Exponent Photon Counts & Radius.
15. Practice Mental Ray Nodes and Mental Ray Shaders for any object.
16. Simulating both Sun Setup & Sky Setup by using mental ray rendering techniques.
17. Practice on Mental Ray Shadow Map with examples.
18. Demonstrates the types of V-ray Lights
19. Light The Exterior Using V-ray Rendering System.
20. Light The Interior Using V-ray Rendering System
21. Exercise on different materials used in V-ray Lights

The competencies and key competencies to be achieved by the student

S.N o.	Name of the experiment	Objectives	Key Competencies
1	Practice on any image by changing common light attributes	Identify the different common light attributes	<ul style="list-style-type: none"> ❖ Identify the attributes of light ❖ Practice with different attributes values ❖ Compare different images with different attributes.
2	Exercise on various light menu options	Identify the various options in light menu	<ul style="list-style-type: none"> ❖ Identify different menu options ❖ Practice all menu options
3	Practice on different types of lights	Identify the various types of light	<ul style="list-style-type: none"> ❖ Know the concept of light ❖ Identify different types of light ❖ Differentiate various types of light ❖ Practice with different lights
4	Demonstrates the Positioning Lights by taking an image	Identify the various position values to projection light	<ul style="list-style-type: none"> ❖ Identify the position values in lighting ❖ Exercise on different position values for different images
5	Light the Interior or Exterior or 3d point Scene Using Software Render for any image	Identify the different types Light Setup	<ul style="list-style-type: none"> ❖ Know the types of Light setup ❖ Practice Exterior Light Setup ❖ Practice Interior Light Setup ❖ Practice 3D point Light Setup ❖ Compare images with different types of Light setup
6	Practice how to create Sun Direction Light Scene to an image	Develop sun direction light	<ul style="list-style-type: none"> ❖ Know about sun direct light ❖ Create sun direction light scene
7	Demonstrates the Camera Settings and Ray Trace Setting	Identify the Camera setting options and Ray trace setting options	<ul style="list-style-type: none"> ❖ Know about camera Settings ❖ Know about the Ray trace settings ❖ Practice on both camera and ray trace settings
8	Light The Scene With Indirect or Global Illumination Using Skylight System	Identify the global and Indirect illumination lighting	<ul style="list-style-type: none"> ❖ Know different illumination types ❖ Practice Indirect illumination using sky light ❖ Practice Global illumination using sky light ❖ Compare both techniques
9	Practice on Photon Color& Intensity	Mention Photon Color	<ul style="list-style-type: none"> ❖ Know about Photon color and Intensity concept

	with different measurements	and Intensity	❖ Practice with different measurements on photon color and intensity
10	Render The Interior Set In Layer Render Techniques Using Mental Ray Render	Identify different Render techniques	❖ Identify Interior Set In Layer Render Technique ❖ Practice the Interior Set In Layer Render Techniques Using Mental Ray Render
11	Exercise on Exponent Photon Counts & Radius.	Identify the count of photon and measure radius	❖ Know about count of photon ❖ Know about radius of photon ❖ Practice with different values
12	Practice Mental Ray Nodes and Mental Ray Shaders for any object.	Know the concept of Mental Ray Nodes and Mental Ray Shaders	❖ Identify various Mental Ray Nodes and Mental Ray Shaders ❖ Exercise Mental Ray Nodes and Mental Ray Shaders on any image
13	Simulating both Sun Setup & Sky Setup by using mental ray rendering techniques.	Identify Sun Setup & Sky Setup	❖ Identify different Setups in mental ray rendering techniques ❖ Exercise Sun Setup & Sky Setup by using mental ray rendering techniques
14	Practice on Mental Ray Shadow Map with examples.	Identify Mental Ray Shadow Map technique	❖ Know about shadow map technique ❖ Practice on Mental Ray Shadow Map with different example images.
15	Demonstrates the types of V-ray Lights	Identify different types of V-Ray lights	❖ Know the types of V-Ray light ❖ Practice different types of V-Ray light
16	Light The Exterior or Interior Using V-ray Rendering System	Identify different types of V-ray Rendering System	❖ Identify types of V-ray Rendering System ❖ Practice both Exterior or Interior Using V-ray Rendering System
17	Exercise on different materials used in V-ray Lights	Identify different types of materials used in V-ray Lights	❖ Know the different materials in V-ray Lights ❖ Practice on different materials used in V-ray Lights ❖ Compare all different materials

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-410	Networking And Web Designing Lab	7	105	40(20 – Networking + 20- Mini Project)	60 (30- Networking +30- Mini project)

GUIDE LINES:

- All the exercises provided in the list of practical's should be completed and submitted during the semester examination.
- In order to develop skill in mastering creativity, every student should be made to practice thoroughly.
- The external examiners are requested to ensure that a single practical oriented question should not be given to more than three students while admitting a batch of 30 students during Board Examination.

S No	Chapter/ Unit Title	No. of Periods	COs Mapped
1.	Computer Networking	30	CO1,CO2,CO3
2.	Network Maintenance through server	30	CO3,CO4
	Networking Lab Total	60	
3	Mini Project (should be developed - Based on Web designing Course)	45	CO1,CO2,CO3,CO4,CO5,CO6
	Mini Project Total	45	
Total No. of Hours		105	

COURSE OBJECTIVES	<ol style="list-style-type: none"> 1. Identify all the components of mother board. 2. Install drives, NIC cards, modems(internal, external) 3. Install network devices, design and develop network. 4. Understand ip address classes and sub netting 5. Prepare cross and straight Ethernet cables 6. Install and configure proxy server 7. Install any network operating system and Control/maintain the network and network resources using server administration. 8. Troubleshoot the entire network
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	<p>9. Setting up VPN</p> <p>10. Develop a Live Web based Animation Mini Project based on the Knowledge acquired in web designing Theory Course.</p>
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Course Outcomes	CO1	AG-410.1	Identify the PC Components.
	CO2	AG-410.2	Install network devices, Design and develop network and perform sub-netting
	CO3	AG-410.3	Install any Operating system and maintain/ control the entire network as a system administrator
	CO4	AG-410.4	Troubleshoot entire network.
	CO5	AG-410.5	Install any network device and configure
	CO6	AG-410.6	Developing a Live Web based Mini project to encourage group activity

CO-PO/PSO MATRIX

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
AG-410.1	2	1	2					2		
AG-410.2	3	3	1	3				2		
AG-410.3	2	2	3	2	3	2	2	2	2	2
AG-410.4	2	2	2			2	2	2		2
AG-410.5	3	3	1	3				2		
AG-410.6	2	2	3	2	3	2	2	2		2
Average	2.3	2.2	2	2.5	3	2	2	2	2	2

3=Strongly mapped , 2=moderately mapped, 1=slightly mapped

Learning Outcomes:

Computer Networking

1. Exercise on Identification and familiarization of various components of computer system.
 - a. Identify and note down mother board , Components and Chips
 - b. Identify various Internal and External slots in the mother board and clean them with blower/ Brush.
 - c. Practice Inserting and Removing RAM with care
 - d. Measure the Output voltages of SMPS
2. Exercise on Installation of Network card.
3. Exercise on Dis-assembling and assembling of working desktop.
4. Exercise on Preparing the Ethernet cable for cross and direct connections using crimping tool and test using LAN tester.
5. Exercise on Installation of a switch and connecting systems to a network switch.

6. Exercise on Installation of a modem (internal, external or USB) and connecting to internet.
7. Exercise on Using FTP for uploading and downloading files.
8. Exercise on Installation and configuring the proxy server for internet access.
9. Exercise on Setting of particular IP address to an existing terminal system
10. Exercise on Installation of network operating system

Network Maintenance through server

11. Exercise on Creating and managing user accounts through network server.
12. Exercise on Configuration of DHCP and DNS
13. Exercise on File/Folder accessing rights for sharing
14. Exercise on remote desktop.
15. Exercise on setting up of VPN on network
16. **Mini Project:**

The competencies and key competencies to be achieved by the student

S.No.	Name of the experiment	Objectives	Key Competencies
1	Exercise on Identification and familiarization of various components of computer system.	Identification and familiarization of various components of computer system.	<ul style="list-style-type: none"> ❖ Identify and note down mother board , Components and Chips. ❖ Identify various Internal and External slots in the mother board and clean them with blower/ Brush. ❖ Practice Inserting and Removing RAM with care. ❖ Measure the Output voltages of SMPS.
2	Exercise on Installation of Network card.	Installation of Network card.	<ul style="list-style-type: none"> ❖ Identify the slot for placing NIC card ❖ Know how to place NIC card ❖ Install required NIC driver ❖ Check for working status of NIC card
3	Exercise on Dis-assembling and assembling of working desktop.	Dis-assembling and assembling of working desktop.	<ul style="list-style-type: none"> ❖ Identify all the peripherals of Desktop computer. ❖ Check the working condition of system before dis-assembling it. ❖ Dis-assemble all the peripherals. ❖ Assemble all the peripherals. ❖ Check the working condition of system after assembling it.
4	Exercise on Preparing the Ethernet cable for cross and direct connections using crimping tool and test using LAN tester.	Preparing the Ethernet cable for cross and direct connections using crimping tool and test using cable tester.	<ul style="list-style-type: none"> ❖ Know the color pattern of Ethernet cable for direct connection. ❖ Prepare UTP cable for direct connection using crimping tool. ❖ Check the working condition of cable using LAN tester. ❖ Know the color pattern of Ethernet cable for cross connection. ❖ Prepare UTP cable for cross connection

			<p>using crimping tool.</p> <ul style="list-style-type: none"> ❖ Check the working condition of cable using LAN tester.
5	Exercise on Installation of a switch and connecting systems to a network switch.	Installation of a switch and connecting systems to a network switch	<ul style="list-style-type: none"> ❖ Know the purpose of switch ❖ Run Ethernet cables from switch to individual computers ❖ Connect Ethernet cables of computers to switch. ❖ Check the network status of the connection in computer system.
6	Exercise on Installation of a modem (internal, external or USB) and connecting to internet.	Installation of a modem (internal, external or USB) and connecting to internet.	<p>Internal modem</p> <ul style="list-style-type: none"> ❖ Identify PCI slot for placing Internal modem ❖ Connect internal modem ❖ Install required modem driver ❖ Check for the working condition <p>External modem</p> <ul style="list-style-type: none"> ❖ Connect External modem ❖ Install required modem driver ❖ Check for the working condition <p>USB modem</p> <ul style="list-style-type: none"> ❖ Connect USB modem ❖ Install required modem driver ❖ Check for the working condition
7	Exercise on Using FTP for uploading and downloading files.	Using FTP for uploading and downloading files.	<ul style="list-style-type: none"> ❖ Know about FTP protocol ❖ Know how to upload file using FTP ❖ Know how to download file using FTP
8	Exercise on Installation and configuring the proxy server for internet access	Installation and configuring the proxy server for internet access	<ul style="list-style-type: none"> ❖ Know about proxy server. ❖ Know how to install proxy server. ❖ Know how to configure proxy server.
9	Exercise on Setting of particular IP address to an existing terminal system	Setting of particular IP address to an existing terminal system	<ul style="list-style-type: none"> ❖ Know about IP addresses ❖ Know how to set IP addresses to the computer systems in a LAN
10	Exercise on Installation of network operating system	Installation of network operating system	<ul style="list-style-type: none"> ❖ Know about Network operating systems. ❖ Know about different network operating systems. ❖ Install any Network operating systems ❖ Configure the system with the proper settings.
11	Exercise on Creating and managing user accounts through network server.	Creating and managing user accounts through network server.	<ul style="list-style-type: none"> ❖ Know how to create user accounts ❖ Know how to modify user accounts ❖ Know how to delete user accounts

12	Exercise on Configuration of DHCP and DNS.	Configuration of DHCP and DNS.	<ul style="list-style-type: none"> ❖ Know about static IP address, dynamic IP address ❖ Know about DHCP ❖ Configure the DHCP ❖ Know about DNS ❖ Configure the DNS
13	Exercise on File/Folder accessing rights for sharing	File/Folder accessing rights for sharing.	<ul style="list-style-type: none"> ❖ Know the different accessing rights ❖ Know how to give access rights ❖ Know how to remove access rights ❖ Know how to share file/folders
14	Exercise on remote desktop.	Exercise on remote desktop.	<ul style="list-style-type: none"> ❖ Know about remote login ❖ Know how to login to the remote desktop
15	Exercise on setting up of VPN on network	Exercise on setting up of VPN on network	<ul style="list-style-type: none"> ❖ Know about VPN ❖ Know how to configure VPN service
16	Mini Project	Student has develop a Web Based Mini Project by applying the knowledge acquired.	<p>Student Activities:</p> <ul style="list-style-type: none"> ❖ Create Animation Clips ❖ Create Images with different proportions ❖ Create Photographs. ❖ Develop Cartoon Movies. ❖ Develop web pages ❖ Upload them to the web site ❖ Import from web site ❖ Integrate web with photoshop, dream viewer, Flash etc ❖ Upload media data into YouTube, Facebook, Twitter, Instragram ...etc.

V SEMESTER

**DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
SCHEME OF INSTRUCTIONS AND EXAMINATION**

CURRICULUM-2020

(V Semester)

Sub Code	Name of the Subject	Instruction Periods/Week		Total Periods Per Semester	Scheme Of Examinations			
		Theory	Practicals		Duration (hrs)	Sessional Marks	End Exam Marks	Total Marks
THEORY SUBJECTS								
AG-501	Industrial Management and Entrepreneurship	5	-	75	3	20	80	100
AG-502	3D rigging AND Character animation	6	-	90	3	20	80	100
AG-503	Cinema autography	4	-	60	3	20	80	100
AG-504	Advanced 3D dynamics	4	-	60	3	20	80	100
AG-505	Visual EFX and Compositing Techniques	5	-	75	3	20	80	100
PRACTICAL SUBJECTS								
AG-506	3D rigging AND Character animation lab	-	3	45	3	40	60	100
AG-507	Compositing Lab	-	3	45	3	40	60	100
AG-508	Life Skills	-	3	45	3	40	60	100
AG-509	Editing Lab	-	3	45	3	40	60	100
AG-510	Project work	-	6	90	3	40	60	100
	Total	24	18	630	-	260	640	900

Note:AG-501Common with DIT,DCME,DAME Branches

AG-502, AG-503, AG-505 , AG-506, AG-507, AG-509 , AG-510 common with DAME

AG-508 common with all

Course code	Course Title	No. of Periods/ Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-501	Industrial Management and Entrepreneurship	5	75	20	80

S.No.	Chapter/Unit Title	No.of Periods	CO's Mapped
1.	Principles and functions of Industrial Management	08	CO1
2.	Organisation structure & Organisational behaviour	16	CO2
3.	Production Management	12	CO3
4.	Materials Management, Maintenance management & Industrial Safety	19	CO4
5.	Entrepreneurship Development & Quality management.	20	CO5
Total Periods		75	

Course Objectives	<p>Upon completion of the course the student shall be able to</p> <ol style="list-style-type: none"> Understand the principles and functions of industrial management, organisation structure and organisational behaviour. Understand the production management, materials management, maintenance management and industrial safety. Understand the entrepreneurship development and trends in management.
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At the end of the course the student will be able to:			
Course Outcomes	CO1	AG-501.1	Explain various principles and functions of industrial management.
	CO2	AG-501.2	Explain organisation structure and organisational behaviour.
	CO3	AG-501.3	Apply CPM and PERT techniques in production management.
	CO4	AG-501.4	Explain materials management techniques, maintenance management and industrial safety.
	CO5	AG-501.5	Describe Entrepreneurship Development and Quality management aspects.

CO-PO/PSO Matrix:

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
AG-501.1	2				2	2		2		

AG-501.2	2			2	2	2		2		
AG-501.3	1	3	3	2		3			3	3
AG-501.4	2			2	2	2		2		2
AG-501.5	3		1		2	2	3	2		2
Average	2	3	2	2	2	2.2	3	2	3	2.3

3=strongly mapped, 2=moderately mapped, 1=slightly mapped

Learning outcomes:

Principles and functions of Industrial Management

- 1.1 Define industry, commerce (Trade) and business.
- 1.2 Know the need for management.
- 1.3 Understand the evolution of management
- 1.4 Understand functions of Management.
- 1.5 Explain the principles of scientific management.
- 1.6 Explain the principles of management.
- 1.7 Differentiate between management and administration.
- 1.8 Understand the nature of management as a profession
- 1.9 Differentiate between supervisory, middle and Top level management
- 1.10 Explain the importance of managerial skills (Technical, Human, Conceptual)

2.0 Organisation Structure & organisational behaviour

- 2.1 Explain the philosophy and need of organisation structure of an industry.
- 2.2 Discuss the line, staff and Functional organisations
- 2.3 Explain the Authority and Responsibility Relationships
- 2.4 List the differences between Delegation and decentralization
- 2.5 Explain the factors of effective organisation
- 2.6 Outline the communication process
- 2.7 State motivational theories.
- 2.8 State Maslow's Hierarchy of needs.
- 2.9 List different leadership models.
- 2.10 Explain the trait theory of leadership
- 2.11 Explain behavioural theory of Leadership
- 2.12 Explain the process of decision making.
- 2.13 Assessing Human resource requirements
- 2.14 Describe the concept of Job analysis, Job description and specifications
- 2.15 Explain the process of recruitment, selection, training and development
- 2.16 List and explain types of business ownerships
- 2.17 Differentiate between the business ownerships
- 2.18 State the objectives of Employee participation
- 2.19 Give the meaning and definition social responsibilities
- 2.20 Explain corporate social responsibilities

3.0 Production management

- 3.1 Identify the factors of Plant Location
- 3.2 List the objectives of plant Layout
- 3.3 State the principles of plant Layouts

- 3.4 Explain the types of plant Layouts
- 3.5 Relate the production department with other departments.
- 3.6 State the need for planning and its advantages.
- 3.7 State different types of production.
- 3.8 Explain the stages of Production, planning and control.
- 3.9 List the basic methods forecasting
- 3.10 Explain routing methods.
- 3.11 Explain scheduling methods.
- 3.12 Explain dispatching.
- 3.13 Explain Break Even Analysis
- 3.14 Define supply chain Management, competitive strategy, Supply chain strategy
- 3.15 Explain project scheduling.
- 3.16 Draw CPM and PERT networks.
- 3.17 Identify the critical path.
- 3.18 Solve numerical problems on CPM and PERT.

4.0 Materials Management, Maintenance management & Industrial Safety

- 4.1 Explain the importance and functions of materials management in Industry.
- 4.2 State an expression for inventory control.
- 4.3 Explain ABC analysis.
- 4.4 Define safety stock and reorder level
- 4.5 State an expression for economic ordering quantity.
- 4.6 State the functions of Stores Management,
- 4.7 Explain types of store layouts.
- 4.8 List out stores equipment and stores records.
- 4.9 Explain general purchasing procedures
- 4.10 Explain tendering, E-tendering and E-procurement procedures
- 4.11 List purchase records.
- 4.12 Explain the Bin card.
- 4.13 Describe Cardex method.
- 4.14 List the applications of RFID in material management

- 4.15 Explain Objectives and activities of maintenance management
- 4.16 Explain the importance of maintenance management in Industry.
- 4.17 Explain the importance of Preventive maintenance
- 4.18 State the need for scheduled maintenance
- 4.19 Differentiate between scheduled and preventive maintenance
- 4.20 Know the principles of 5 s for good housekeeping
- 4.21 Explain the importance of safety at Work place.
- 4.22 List the important provisions related to safety.
- 4.23 Explain hazard and accident.
- 4.24 List any six different hazards in the Industry.
- 4.25 Explain any six causes of accidents.
- 4.26 Explain the direct and indirect causes of accidents.
- 4.27 Explain the types of emission from process Industries, their effects environment and control
- 4.28 Describe the principles of solid waste management

5.0 Entrepreneurship Development & Quality management.

- 5.1 Define the word entrepreneur.
- 5.2 Explain the requirements of an entrepreneur.
- 5.3 Determine the role of entrepreneurs in promoting Small Scale Industries.
- 5.4 Describe the details of self-employment schemes.
- 5.5 Characteristic of successful entrepreneurs
- 5.6 Explain the method of site selection.
- 5.7 List the financial assistance programmes.
- 5.8 List out the organisations that help an entrepreneur
- 5.9 Know the use of EDPProgrammes
- 5.10 Understand the concept of make in India, Zero defect and zero effect
- 5.11 Understand the importance for startups
- 5.12 Explain the conduct of demand surveys
- 5.13 Explain the conduct of a market survey
- 5.14 Evaluate Economic and Technical factors.
- 5.15 Prepare feasibility report study
- 5.16 Explain the concept of quality.
- 5.17 List the quality systems and elements of quality systems.
- 5.18 State the principles of quality Assurance.
- 5.19 Explain management information system (MIS)
- 5.20 Explain the basic concepts of TQM
- 5.21 State the Pillars of TQM
- 5.22 List the evolution of ISO standards.
- 5.23 Explain ISO standards and ISO 9000 series of quality systems.
- 5.24 List the beneficiaries of ISO 9000.
- 5.25 Explain the concepts of ISO 14000
- 5.26 Give the overview of PDCA cycle
- 5.27 State Kaizen strategy.

Course Content

1. Principles and functions of Industrial Management

Introduction: Industry, Commerce and Business; Definition of management; Functions of management - Principles of scientific management by F.W.Taylor, Principles of Management by Henry Fayol; Administration and management; levels of management; managerial skills;

2. Organisation Structure & organisational behaviour

Organizing - Process of Organizing; Line, Staff and functional Organizations, Decentralization and Delegation, Communication, Motivational Theories; Leadership Models; Human resources development; recruitment selection training and development, Forms of Business ownerships: Types – Sole proprietorship, Partnership, Joint Stock Companies, Cooperative Organization; objectives of employee participation, Corporate Social responsibility;

3. Production management

Definition and importance; objectives and principles of plant layout, Plant location and types of layout; Types of production -job, batch and mass; production Planning and Control: basic methods of forecasting, routing, scheduling, dispatching and follow up; Break even analysis; Project scheduling; Application of CPM and PERT techniques; simple numerical problems;

4. Materials Management, Maintenance management & Industrial Safety

Materials in industry, Importance and functions of materials management, Basic inventory control model, ABC Analysis, Safety stock, re-order level, Economic ordering quantity, Stores Management: Stores layout, stores equipment, Stores records, purchasing procedures, tendering, e-tendering, e-procurement; purchase records, Bin card, Cardex, RFID Applications in materials management, Objectives and importance of maintenance management, Different types of maintenance, Schedules of preventive maintenance, scheduled maintenance Advantages of preventive maintenance, Advantages of scheduled maintenance, Importance of Safety at work places; industrial hazards; Causes of accidents.5S Principles

5. Entrepreneurship Development & Quality Management.

Definition of Entrepreneur; Requirements of entrepreneur, Role of Entrepreneur; Entrepreneurial Development, Details of self employment scheme, financial assistant programmes, organisations that help entrepreneurs (SSI, MSME, DIC, Banks) Concept of Make In India, ZERO defect, Zero Effect, Concept of Start-up Company, Demand survey and Market survey; Preparation of Feasibility study reports
 Concept of quality, quality systems and its terms, principles of quality assurance, Introduction to Management Information System (MIS); Total Quality Management (TQM), ISO 9000 series , ISO-14000, Deming's PDCA Cycle (Plan, Do, Check and Action). Kaizen Strategy (continuous improvement)

REFERENCE BOOKS

1. Industrial Engineering and Management -by O.P Khanna
2. Production Management- by Buffa.
3. Engineering Economics and Management Science - by Banga & Sharma.
4. Personnel Management by Flippo.
5. Production and Operations Management –S.N. Chary
6. Converging_Technologies_for_Smart_Environments_and_Integrated_Ecosystems_IERC_Book_Open_Access_2013pages-54-76
7. Supply Chain Management –Sunil Chopra and Meindl, PHI publishers
8. 5 S made easy by David Visco

Model Blueprint :

S.No.	Chapter/Unit title	No.of periods	Weightage Allocated	Marks Wise Distribution of Weightage				Question wise Distribution of Weightage				CO's Mapped
				R	U	Ap	An	R	U	Ap	An	
1	Principles and	08	11	3	8			1	1			CO1

	functions of Industrial Management											
2	Organisation structure & Organisational behaviour	16	14	3	11		10*	1	2		*	CO2
3	Production Management	12	14	3	11		10*	1	2		*	CO3
4	Materials Management, Maintenance management & Industrial Safety	19	14	6	8		10*	2	1		*	CO4
5	Entrepreneurship Development & Quality management.	20	17	9	8		10*	3	1		*	CO5
	Total *	75	70 +10(*)	24	46		10*	8	7		1	

Note: Part-C: 10 marks single analytical question may be chosen from any one of starred chapters.

Table specifying the scope of syllabus to be covered for unit tests

Unit Test	Learning outcomes to be covered
Unit test-1	From 1.1 to 3.18
Unit test-2	From 4.1 to 5.27

**DIPLOMA IN 3d animation and Graphics Engineering
MODEL PAPER
Industrial Management and Entrepreneurship
UNIT TEST-1**

SCHEME: C-20

SUBJ CODE:AG-501

MAX MARKS: 40

TIME: 90Minutes

PART-A

16 Marks

Instructions:1) Answer all questions

2) First question carries 4marks, and each question of remaining carries 3marks

- 1. a) Management and Administration are synonyms (True/False) (CO1)
- b) Maslow's Hierarchy of needs states (CO2)
- c) CPM stands for..... (CO3)
- d) Which one the following is not a managerial skill [] (CO3)
- i) Technical II)Commercial III)Human IV) Conceptual
- 2) Define supervisory management. (CO1)
- 3) Differentiate delegation and decentralization. (CO2)
- 4) List the objectives of plant Layout. (CO3)
- 5) Define project scheduling. (CO3)

PART-B

3 X 8=24Marks

Instructions: 1) Answer all questions

2)Each question carries 8 Marks

3)Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer

- 6.A. Explain the principles of management. (CO1)
- (Or)
- B.Explain the nature of management as a profession. (CO1)
- 7.A.Describe line, staff and functional organizations. (CO2)
- (Or)
- B.Explain the Concept of Job Analysis, Job Description & specification. (CO2)
- 8. A. Explain Break-Even Analysis. (CO3)
- (Or)
- B.In the table below a list of activities are there and their duration is given: (CO3)

Activity											
Duration											

- (a) Prepare the network.
- (b) Identify critical path.
- (c) Calculate the project completion.

BOARD DIPLOMA EXAMINATIONS

**DIPLOMA IN C3d animation and graphics ENGINEERING
MODEL PAPER –END EXAMINATION
Industrial Management and Entrepreneurship**

**SCHEME: C-20
MAX MARKS:80**

**SUBJ CODE:AG-501
TIME: 3HOURS**

PART - A

Answer all the Questions. Each Question Carries 3 marks

1. Define industry, commerce and business. (CO1)
2. Write the advantages of line and staff organization. (CO2)
3. What are the types of leadership? (CO2)
4. Define the following (CO3)
 - (a) Routing
 - (b) Scheduling
5. State the importance of materials management (CO3)
6. Differentiate between bin card and cardex method (CO4)
7. List any three important provisions related to safety (CO4)
8. Define the term Entrepreneur. (CO5)
9. List the financial assistance programs. (CO5)
10. State the benefits of ISO 9000 series. (CO5)

PART – B

Answer all the Questions. Each Question Carries 8 marks

- 11.A. Explain the principles of scientific management. (CO1)
- OR
- B.Explain the importance of managerial skills (CO1)
- 12.A.Define motivation. Explain Maslow’s need hierarchy theory. (CO2)
- or
- B.Explain the types of business ownerships. (CO2)
13. A. Explain the stages of production, planning and control (CO3)
- Or
- B.In the table below a list of activities are there and their duration is given :(CO3)

Activity											
Duration											

- (d) Prepare the network.
- (e) Identify critical path.
- (f) Calculate the project completion.

14. A. Explain ABC analysis with the help of neat sketch. (CO4)
- Or
- B. Explain the importance of maintenance management in industry. (CO4)
15. A. Explain the details of self-employment schemes. (CO5)
- Or
- B. Explain the role of entrepreneurs in promoting small scale industries. (CO5)

PART – C

1X10=10Marks

16. Explain the importance of safety at work place and any five causes of accidents in industry.
(CO4)

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-502	3D Rigging AND Character animation	6	90	20	80

S.No.	Chapter/Unit Title	No.of Periods	CO's Mapped
1.	RIGING MENUS & EDITORS SKELTON SETUP& PROPSRIGGING Robot rigging	20	CO1.
2.	CHARCTER RIGGING WORK FLOW QUADRUPED RIGGING SETUP ADVANCE RIGGING TECHNIQUES	24	C02
3.	ANIMATION MENUS& EDITORS BASIC ANIMATION TECHNIQUES	16	CO3
4.	LINEAR ANIMATION TECHNIQUES NON-LINEAR ANIMATION TECHNIQUES	18	C04
5.	FACIAL ANIMATION& LYP SYNC	12	C05
Total Periods		90	

Course Objectives	<ul style="list-style-type: none"> • Understand the 3D graphics animation pipeline and to become Familiar with Maya software handling • Able to handle character & mechanicalrig and becoming 3-D riggingartist and creating pre visualization • Become animation artist to apply character animation techniques • 3d projects rigging & animation and Handling 3d projects from various media • Understand the filmhistory, script writingtechniques and story writingtechniques • Able to make documentaryfilms and Short Films • Able To Handle ProductionUnit, cameras&apply techniques and to play role of a director.
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CO NO		COURSE OUTCOMES After completion of this course thew student will be able to
CO1	AG-502.1	Apply Skelton setup & Props Rigging, Robot Rigging Tools and Controls and menu controls.
CO2	AG-502.2	Use Human Anatomy, Quadruped Anatomy and Advanced rigging techniques.
CO3	AG-502.3	Explain Animation Menus, Editors and Basic Animation Techniques.
CO4	AG-502.4	Designing Linear and Non-Linear character Animation and Animation techniques.
CO5	AG-502.5	Apply Facial animation and Lip Sync features.

CO-PO/PSO MATRIX

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
AG-502.1	3	3	3	3	2	2	1	3	3	3
AG-502.2	3	2	3	2	3	2	1	3	3	3
AG-502.3	3	2	3	3	1	1	2	3	3	3
AG-502.4	3	1	3	3	1	2	1	3	3	3
AG-502.5	3	3	3	3	3	3	1	3	3	3
Average	3	2.2	3	2.8	2	2	1.2	3	3	3

3=Strongly mapped , 2=moderately mapped, 1=slightly mapped

Learning outcomes:

1.0. RIGGING MENUS & EDITORS, SKELTONSETUP & PROPS RIGGING and ROBOT RIGGING

- 1.1 Define the terms Rig, Rig Structure, Skelton, Joint
- 1.2 Explain types of tools for rigging and process of starting rigging
- 1.3 List various types of joints
- 1.4 Create joints
- 1.5 Explain about Joint Tool
- 1.6 State the significance of joint chain
- 1.7 Define joint bone
- 1.8 Explain how to use hierarchy editor tool
- 1.9 Explain Set Driven
- 1.10 Give the steps to use connection editor
- 1.11 Explain the process of controls creation
- 1.12 Add and edit attribute in connection Editor
- 1.13 Explain about Outliner
- 1.14 Explain various types of constraints (Point, Aim, Orient, Parent Normal, Tangent, Pole vector)

- 1.15 Describe Grouping & Parenting
- 1.16 Explain the usage of channel box
- 1.17 Describe usage of pivot point
- 1.18 Explain Freeze Transformations
- 1.19 State the purpose of Building Skeletons
- 1.20 Explain human Skelton anatomy
- 1.21 List and explain character setup tools
- 1.22 List out types of joints
- 1.23 Discuss about different types of joints (Ball joint, Insert Joints, Connect Disconnect Joints, Joint Orients)
- 1.24 Explain join Limits and Naming Joints
- 1.25 Explain the procedure of creating joints for leg, hand, spine
- 1.26 Describe about mirror joints
- 1.27 Explain about Skeleton Hierarchy
- 1.28 Describe about Reroot Skeletons
- 1.29 Explain the procedure of Creating Robotic Skeletons
- 1.30 Describe about orients
- 1.31 Explain the process of naming child and parent rig
- 1.32 Describe applying constraints
- 1.33 Explain set driven controls
- 1.34 How to use Inverse Kinematics
- 1.35 Explain about IK Handles & Attributes
- 1.36 Explain about IK solvers
- 1.37 Explain about RP & SC Solvers
- 1.38 Describe about Spine IK
- 1.39 Explain various types of Non-Linear Deformers
- 1.40 Describe about clusters
- 1.41 Explain about Prop Rigs with Deformer

2.0. CHARACTER RIGGING WORKFLOW, QUARDRPED RIGGING SETUP and ADVANCE RIGGING TECHNIQUES:

- 2.1 Explain Skelton Anatomy
- 2.2 Explain process of manual Skelton creation
- 2.3 How to use IK Skelton Generator
- 2.4 Understand the use of Characterization Tool
- 2.5 Explain about Character Controls
- 2.6 Explain Leg IK Rigging, Spine Rigging, Hand Rigging
- 2.7 Explain How to create proper controls
- 2.8 Describe How to create Stretching & Squash
- 2.9 State the use of Script Editor
- 2.10 Create character set using script Editor
- 2.11 Use of proper grouping and character set

- 2.12 Creation of bind skin, interactive skin Bind
- 2.13 List out paint skin weight Tools
- 2.14 Explain mirror & Copy Skin Weights
- 2.15 Explain quadruped Anatomy
- 2.16 Explain manual Skelton creation and naming
- 2.17 State the use LK handler and LK Spine Handler
- 2.18 Explain leg Rig with Grouping Method and Reverse Foot method
- 2.19 Explain Spline Rig with Clusters Method
- 2.20 Describe Tail and Neck Rigging
- 2.21 Create Proper Controls, character set
- 2.22 Explain Bind Skin, interactive Skin Bind
- 2.23 Describe Paint Skin WeightTool
- 2.24 Use of Explain Mirror & Copy Skin Weights
- 2.25 Explain Component Editor
- 2.26 Describe Facial Rigging
- 2.27 Create Facial Joints
- 2.28 Applying Constraints
- 2.29 Procedure to create proper control and user interface
- 2.30 Explain facial Control Window
- 2.31 Explain Set Driven
- 2.32 Explain Eye Grouping, Eye Rigging
- 2.33 Use of jaw rig, Tongue Rig
- 2.34 Describe creation of facial Expression
- 2.35 State the need of Blend Shape
- 2.36 Discuss Blend shape Editors
- 2.37 Explain Lip Sync Rigging
- 2.38 List various Lip Sync Controls
- 2.39 Explain various Sync Effects (Bind Skin, Smooth Bind)
- 2.40 Explain paint Skin Effects
- 2.41 Describe How to add & Remove Influence
- 2.42 Explain Copy & Mirror Skin Weights – Smooth SkinWeights.
- 2.43 State the use of Lattice
- 2.44 State the use of wrap, cluster
- 2.45 Explain Sculpt Deformers, Jiggle Deforms
- 2.46 Explain about Wire Tool
- 2.47 Explain Non-Linear Deforms (Bend, Squash, Sine, Twist, Wave)
- 2.48 Explain Edit Deforms
- 2.49 State the purpose of Weight Tools
- 2.50 Explain the concepts of Export & import ,Deform Weight, Mirror Weight
- 2.51 Describe the process of Control creation
- 2.52 Describe attaching Deform to character Set
- 2.53 Explain Proper Grouping & Hide DeformSource

3.0 ANIMATION MENUS& EDITORS AND BASIC ANIMATION TECHNIQUES.

- 3.1 State the need of Maya 3d animation
- 3.2 Explain various Animation Principles

- 3.3 Describe about Animation Preferences Time Sliders (Play Back, Time Field, Range Slider)
- 3.4 Explain Channel Control Editor
- 3.5 Use of Graph Editor, Trax Editor
- 3.6 Explain about Dope Sheet (Set Key, Auto Key, Cut, Copy, Paste, Delete Keys)
- 3.7 Describe Mute Channels
- 3.8 Make use of DrivenKeys
- 3.9 Explain Breakdowns (In Between)
- 3.10 Explain Ghost Select
- 3.11 Explain Animation Snapshot
- 3.12 Create AnimatedSwapMotionPath
- 3.13 State the use of Use of Turntable
- 3.14 Explain SetTimeCode
- 3.15 Discuss about AnimationClip,
- 3.16 Describe Play Back Speed (Various ObjectAnimation)
- 3.17 Explain Key Frame Animation
- 3.18 Explain Set Key Preferences (Set Driven Keys)
- 3.19 Describe Ball Bouncing Animation
- 3.20 Explain Break Downs (In Between)
- 3.21 Explain Graph Editors & Curve Adjustment (Dope Sheet & Timing Adjustment)
- 3.22 Using Path Animation
- 3.23 Create Orienting the Path Curve (World, Space, Object Space, And Local Space)
- 3.24 Describe Character Pose Setting

4.0. **LINEAR AND NON – LINEAR ANIMATION TECHNIQUES**

- 4.1 Describe Linear Character Animation
- 4.2 Create Pose (Understanding Animation Ctrl, Creating Pose to Walk Cycle)
- 4.3 Explain Types & Techniques in The Poses (Key, In-Between, Extreme)
- 4.4 Describe Steeped Motion Flow
- 4.5 Explain Fine Tune with Tangents
- 4.6 Adjusting With Principles
- 4.7 Explain Graph Editor Curve Flow
- 4.8 Explain Presets of Tangents Snap Keys
- 4.9 Explain Process of Creating Number of Cycles
- 4.10 List out Types of Infinity
- 4.11 Explain Animation Curve Smoothness
- 4.12 Explain Various Types of Animation (Run, Jump, Dancing)
- 4.13 Explain Character with PropsAnimation
- 4.14 Adjust Ctrl Motion Value
- 4.15 Explain Non -Linear Editors
- 4.16 Working With Various Tangents (Breaking Tangent, Weighted Tangents)
- 4.17 Explain Bake Simulation Track Editor Workflow
- 4.18 Create Character Set
- 4.19 Creating Animation Clip, Edit Clips
- 4.20 Define Merging
- 4.21 Explain Grouping & Managing Clips (Trim Wrap, Blending Clips)
- 4.22 Explain Dope Sheet Editors
- 4.23 Explain Timing & Spacing Adjustment
- 4.24 Describe Camera Sequence
- 4.25 Explain Working with Animation Shots (Converting Shot into Sequence)

4.26 Explain Working on Multiple Camera (SequenceOutput.)

5. Facial Animation with LipSync

- 5.1 Describe Acting Skills
- 5.2 Usage of Proper Sequence
- 5.3 Explain Act & Animate Techniques
- 5.4 Create Various Facial Control,
- 5.5 Explain Key Frame & In Between Animation Principles
- 5.6 Describe Fine Tune & Clean Up
- 5.7 Explain Play Back Lip Sync
- 5.8 Explain Listing the Words (Using Vowels)
- 5.9 Create Dialogue with Lip Sync
- 5.10 Describe Editing Lip Sync
- 5.11 Describe the process of record Dialogue
- 5.12 Import Sound
- 5.13 Create The Lip Movement
- 5.14 Explain Animation Principles
- 5.15 Explain Fine Tune & Cleanup
- 5.16 Explain Playback Adjusting with Non-linearEditors

COURSE CONTENT

1. RIGGING MENUS & EDITORS: Joint Tool– Create Joints – Joint Chain–Joints Bones– Hierarchy Editors – Set Driven –Connection Editor – Controls Creating – Add & Edit Attribute – Outliner –Types Of Constraints, Point, Aim ,Orient, Parent Normal, Tangent, Pole vector – Grouping & Parenting – Channel Box – Pivot Point – Freeze Transformations.

SKELTONSETUP & PROPS RIGGING: Building Skeletons: Human Skeletons Anatomy – Character Setup Tools
– Create Joints – Ball Joint–Insert Joints – Connect Disconnect Joints – Joints Orients –Joint’s Limits–Naming Joints – Creating Joints For Leg, Hand ,Spine– Mirror Joints –Skeleton Hierarchy – Reroot Skeletons

ROBOT RIGGING : Creating Robotic Skeletons – Orients & Naming – Child &Parent Rig –Applying Constraints – Set Driven Controls – Using Inverse Kinematics – IK Handles & Attributes –IK Solvers, RP &SC Solvers – Spine IKAttributes – Non Linear Deformers – Clusters — Props Rig With Deformers

2. CHARACTER RIGGING WORKFLOW:

HUMAN RIGGING: Human Anatomy – Skeleton Anatomy – Manual Skeleton Creation – Using IK Skeleton Generator – Characterization Tool – Character Controls – Leg IK Rigging – Spline Rigging – Hand Rigging – Creating Proper Controls – Stretching & Squash – Using Script Editor – Create Character Set – Proper Grouping – Character Set – Bind Skin – Interactive Skin Bind – Paint Skin Weight Tools – Mirror & Copy Skin Weights

QUADRUPED RIGGING SETUP: Quadruped Anatomy – Skeleton Anatomy – Manual Skeleton Creation – Skeleton Naming – Using LK Handler & LK Spline Handler. Leg Rig WithGrouping Method & Reverse Foot Method – Spline Rig with Clusters Method – Tail Rigging – Neck Rigging – Stretch & Squash – Create Proper Controls – Create Character Set – Bind Skin – Interactive Skin Bind – Paint Skin WeightTool– Mirror & Copy Skin Weights – Component Editor

ADVANCE RIGGING TECHNIQUES: Facial Rigging: Creating Facial Joints – Applying Constrain – Create Proper Control – Create User Interface – Facial Control Window – Set

Driven – Connection Editor – Eye Grouping – Eye Rigging – Jaw Rig – Tongue Rig – Facial Expression Creation – Blend Shape – Blend Shape Editors – Lip Sync Rigging – Lip Sync Controls – Various Sync Effects – Bind Skin – Smooth Bind – Paint Skin Weights – Add & Remove Influence – Copy & Mirror Skin Weights – Smooth SkinWeights. **Deformers:** Lattice – Wrap – Cluster – Sculpt Deformers – Jiggle Deforms – Wire Tool – Non Linear Deforms – Bend, Squash, Sine, Twist, Wave – Blend Shape – Edit Deforms – Weight Tools – Export & Import Deform Weight – Mirror Weight – Control Creation – Attach Deform To Character Set – Proper Grouping & Hide DeformSource

3. ANIMATION MENUS& EDITORS: Intro To Maya 3danimation – Animation Principles – Animation Preferences Time Sliders – Play Back – Time Field – Range Slider – Channel Control Editor – Graph Editor – Trax Editor – Dope Sheet –Set Key- Auto Key – Cut, Copy, Paste ,,Delete Keys – Mute Channels–DrivenKeys,Breakdowns – In Between – Ghost Select – Animation Snapshot – Create AnimatedSwapMotionPath–Turntable–SetTimeCode–AnimationClip , Play Back Speed – Various ObjectAnimation

BASIC ANIMATION TECHNIQUES: Key Frame Animation: Set Key Preferences – Set Driven Keys – Ball Bouncing Animation – Break Downs – In Between – Graph Editors & Curve Adjustment – Dope Sheet & Timing Adjustment. – Path Animation – Orienting the Path Curve – World, Space, Object Space, And Local Space
– Intro Character Pose Setting– Hands on Practice

4. LINEAR ANIMATION TECHNIQUES: Linear Character Animation: Create Pose – Understanding Animation Ctrl – Creating Pose To Walk Cycle – Types & Techniques In The Poses – Key, In-Between, Extreme – Steeped Motion Flow – Fine Tune With Tangents – Adjusting With Principles – Graph Editor Curve Flow – Presets Of Tangents -Adjusting A Ctrl Motion Value – Snap Keys– Creating Number Of Cycles – Types Of Infinity – Animation Curve Smoothness – Various Types Of Animation, Run, Jump, Dancing – Character With PropsAnimation

NON-LINEAR ANIMATION TECHNIQUES

Working With Non- Linear Editors: Graph Editor Work Flow – Working with Various Tangents – Breaking Tangent – Weighted Tangents – Bake Simulation Track Editor Workflow – Create Character Set – Creating Animation Clip – Edit Clips – Merging – Grouping & Managing Clips – Trim Wrap – Blending Clips – Dope Sheet Editors – Timing & Spacing Adjustment –Camera Sequence – Working with Animation Shots – Converting Shot Into Sequence – Working On Multiple Camera – SequenceOutput.

5. Facial Animation with LipSync

Intro To Acting Skills – Using Proper Sequence – Act & Animate Techniques – Creating Various Facial Control – Key Frame & In Between Animation Principles – Fine Tune & Clean Up – Play Back Lip Sync – Listing the Words – Using Vowels – Create Dialogue with Lip Sync – Editing Lip Sync – Recording Dialogue – Import Sound – Create the Lip Movement – Animation Principles – Fine Tune & Cleanup – Playback Adjusting With Non-linearEditors

REFERENCE BOOKS:

1. The Animation Book, by Kit Laybourne, Three Rivers Press.
2. The Human Figure In Motion, by Eadweard Muybridge, Dover Publication
3. Animals In Motion, by Eadweard Muybridge, Dover Publication
4. Directing Film techniques and Aesthetics, by Michael Rabiger, Big picture media
5. Shot By Shot , by Steven D.Katz, Columbia university press
6. Film Language, by Christian Metz, Chaplin book publishers

Model Blu Print:

S.No	Chapter/Unit title	No.of periods	Weightage Allocated	Marks Wise Distribution of Weightage				Question wise Distribution of Weightage				CO's Mapped
				R	U	A p	A n	R	U	A p	A n	
1	RIGING MENUS & EDITORS SKELTON SETUP& PROPSRIGGING Robot rigging	20	11	3	8		10	1	1		*	CO1
2	CHARCTER RIGGING WORK FLOW QUADRUPED RIGGING SETUP ADVANCE RIGGING TECHNIQUES	24	17	6	11		10	2	2		*	CO2
3	ANIMATION MENUS& EDITORS BASIC ANIMATION TECHNIQUES	16	14	6	8			2	1			CO3
4	LINEAR ANIMATION TECHNIQUES NON-LINEAR ANIMATION TECHNIQUES	18	14	6	8		10	2	1		*	CO4
5	FACIAL ANIMATION& LYP SYNC	12	14	6	8			2	1			CO5.
	Total	90	70+10*					9	6		1	

Table specifying the scope of syllabus to be covered for unit tests

Unit Test	Learning outcomes to be covered
Unit test-1	From 1.1 to 2.47
Unit test-2	From 3.1 to 5.16

DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
MODEL PAPER
3D rigging AND Character animation
UNIT TEST-1

SCHEME: C-20

SUBJ

CODE:AG-502

MAX MARKS: 40

TIME:

90Minutes

PART-A

16 Marks

Instructions:1) Answer all questions

2) First question carries 4marks, and each question of remaining carries 3marks

(CO1) 1. a) The _____ enables users to create and edit different types of hierarchies

b) Pole Scalar a constraint–(True /False)

(CO1)

c). IK Stands for _____

(CO2)

d) which of the following is the Non-Linear Deform

a) bind b) Bind Skin c) bend d) Flat

(CO2)

2) Define Joint.

(CO1)

3) What is the purpose of Pivot Point

(CO1)

4) List out any three Linear Deforms

(CO2)

5) Write about Mirror Weight

(CO2)

PART-B

3 X 8=24Marks

Instructions: 1) Answer all questions

2) Each question carries 8 Marks

3) Answer should be comprehensive and the criterion for valuation is the

content but not the length of the answer

6.A. Explain various types of constraints.

(CO1)

(Or)

6.B. Explain about set driven controls.

(CO1)

7.A. Describe about clusters
(CO1)
(Or)

7.B. Explain Various Sync Effects
(CO2)

8. A Explain Blend shape Editors (CO2)
(Or)

8.B. Describe Spline Rig
(CO2)

MODEL PAPER –END EXAMINATION
3D rigging AND Character animation

SCHEME: C-20
MAX MARKS:80

SUBJ CODE:AG-502
TIME: 3HOURS

PART - A

Answer all the Questions. Each Question Carries 3 marks

11. Define Joint (CO1)
12. State the use of Script Editor. (CO2)
13. List out paint Skin weight Tools (CO2)
14. Write a short note on Wire Tool (CO2)
15. How to use Driven Keys (CO3)
16. State the use of Graph Editor (CO3)
17. What is a camera Sequence? (CO4)
18. Define Snap Key (CO4)
19. List out any three Animation Techniques (CO5)
20. Write about Key frame (CO5)

PART – B

Answer all the Questions. Each Question Carries 8 marks

11.A. Explain the procedure of creating joints for leg.
(CO1)

OR

B. Explain various types of Non-Linear Deformers
(CO1)

12.A Explain about Character Controls
(CO2)

OR

B. Explain various Sync Effects (CO2)

13.A. Describe Ball Bouncing Animation
(CO3)

OR

B. Describe Character Pose Setting.
(CO3)

14.A. Explain Fine Tune with Tangents
(CO4)

OR

B. Explain Grouping & Managing Clips
(CO4)

15.A. Explain Act & Animate Techniques.
(CO5)

OR

B. Explain Play Back Lip Sync (CO5)

PART – C

1X10=10Marks

17. With the help of animation techniques describe a cartoon character with any 4 poses
(CO4)

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
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AG-503	Cinematography	4	60	20	80
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S.No.	Chapter/Unit Title	No.of Periods	CO's Mapped
1.	Concept & Types Of Camera	10	CO1
2.	Purpose & Type Of Lighting	15	CO2
3.	Lens & Attributes	12	CO3
4.	Cinematography And Styles	13	CO4
5.	The role & ethics of cinematographer	10	CO4,CO5
Total Periods		60	

Course Objectives	<ul style="list-style-type: none"> • Describe types of cameras • Explaining the purpose lighting and types. • Describe various lens and attributes • Describe Cinematography and styles • Stick to ethics of cinematographer.
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CO NO	COURSE OUTCOMES
CO1	AG-503.1 Operate different types of camera and wide screen systems
CO2	AG-503.2 Apply lighting tools and techniques to suit the selected location.
CO3	AG-503.3 Explain the usage of lens and filters with proper attributes
CO4	AG-503.4 Explain cinematographers and their styles
CO5	AG-503.5 Explain the role of cinematographer in coordinating with all the departments involved in feature film making and the ethics to be followed

CO-PO/PSO Matrix:

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CM-503.1	1	2	3	3	3	2	2	1	3	2
CM-503.2	2	3	3	3	2	2	3	1	2	3
CM-503.3	2	3	3	3	2	2	3	1	2	3
CM-503.4	3	1	1	2	2	3	3	1	3	2
CM-503.5	3	3	1	1	3	3	3	1	3	2
Average	2.2	2.4	2.2	2.4	2.4	2.4	2.8	1	2.6	2.4

3=strongly mapped, 2=moderately mapped, 1=slightly mapped

Learning Outcomes:

1. Concept & Types Of Camera

- 1.1** Explain the Concept of camera as a story teller.
- 1.2** List tools of creative cinematography. (Frame, Lens, Texture, Light and color, movement etc.)
- 1.3** Explain tools of creative cinematography.
- 1.4** List different types of camera
 - 1.4.1** Compact Digital Cameras
 - 1.4.2** Digital SLR Cameras
 - 1.4.3** Mirror less Cameras
 - 1.4.4** Action Cameras
 - 1.4.5** 360 Cameras
 - 1.4.6** Film Cameras
- 1.5** List different types of Movie Cameras .(Mitchell, Arriflex, Panavision)
- 1.6** List Different types of Digital Cameras.
- 1.7** Explain Different types of digital Cameras.
- 1.8** List different types of Film Formats.
- 1.9** Explain different types of film formats
- 1.10** List different types of Digital Formats
- 1.11** Explain different types of digital formats.
- 1.12** Explain types of film strip Widths (8mm, 16mm, 35 mm etc.)
- 1.13** List and explain Wide Screen Systems
- 1.14** Discuss about Anamorphic System.
- 1.15** Describe Film stock.

2. Purpose & Type Of Lighting

- 2.1 Explain the concept of lighting for cinematography.
- 2.2 State the aims of lighting in cinematography.
- 2.3 Discuss about Good lighting and bad lighting.
- 2.4 Explain how to set position of lights in cinematography.
- 2.5 Explain the effects if we set position of lights properly.
- 2.6 List the light sources for photography shooting.
- 2.7 Explain the selection of time of shooting.
- 2.8 Explain how to select location for filming.
- 2.9 Explain hard lighting for effective image reproduction.
- 2.10 Explain soft lighting for effective image reproduction.
- 2.11 Explain how to set lighting to create mood and atmosphere.
- 2.12 List special lighting effects.
- 2.13 Explain Special Lighting Effects.
- 2.14 Explain the process of controlling the contrast, tone and clarity of photo.
- 2.15 Explain the play of shadows in photography.
- 2.16 Explain the role of composition as an effective tool of creative cinematographer.
- 2.17 Illustrate the type of lighting used to lighting flat surface and lighting on object.
- 2.18 Explain the role of color and tones with respect to lighting psychology.
- 2.19 List types of lighting. (High key lighting, Low key Lighting, Cameo lighting etc.)
- 2.20 Explain types of lighting.
- 2.21 Explain various styles in large scales lighting in cinematography.
 - 2.21.1 Moon light setup
 - 2.21.2 Day or night effect
 - 2.21.3 Fire sets and mystery

- 2.21.4 Lighting camp fire scene
- 2.21.5 Candle flame
- 2,21,6 Rain, summer moon, etc.
- 2.22 Explain how to expose a light source.
- 2.23 Explain how to use lighting for high speed cinematography
- 2.24 Describe lighting for single frame animation.
- 2.25 Classify cinematography based on time.
- 2.26 Explain about Time slice cinematography.
- 2.27 Explain about Time frame animation.
- 2.26 Discuss about Cinematography style.

3. Lens & Attributes

3.1 List the Factors responsible for the quality image reproduction of a lens system.

3.2 Explain the Factors responsible for the quality image reproduction of a

lens system.

- 3.2.1 Resolution of a lens systems
- 3.2.2 Contrast of lens system
- 3.2.3 Sharpness and definition of lens system
- 3.2.3 Color reproduction of lens system
- 3.3 List different types of lenses used in Cinematography.
- 3.4 Explain different types of lenses used in Cinematography.
- 3.5 Discuss about study of Normal lens.
- 3.6 State the importance of wide angle lens and its effects?
- 3.7 Explain about Focal length and magnification.
- 3.8 Define Depth of Focus.
- 3.9 Discuss about focal plane and flange focal distance in camera systems.
- 3.10 Define hyper focal distance in photography.
- 3.11 List different types of filters used in lens.
- 3.12 Illustrate the use of glass filter in lens.
- 3.13 Illustrate the use of Gelatin filter in lens.
- 3.14 Illustrate the use of Sand witch filters in lens.
- 3.15 Explain Filter factor compensation.
- 3.16 Explain black and white filters in cinematography.
- 3.17 Explain about filters used for colour cinematography.
- 3.18 List the filters used for colour correction and conversion in lens.
- 3.19 List general purpose filters in lens.
- 3.20 Explain different general purpose filters in lens.
 - 3.20.1 ND filters
 - 3.20.2 Graduated filters
 - 3.20.3 Polarizing filter
- 3.21 Explain Angle of view Perspective in Photography.

4. Cinematography And Styles

- 4.1 Explain the cinematography styles.
- 4.2 Describe about Hollywood Cinematographers and European Cinematographers.
- 4.3 List Cinematographers of other countries.
- 4.4 Explain Cinematographers of other countries.
- 4.5 Explain about Contemporary Indian Cinematographers.
- 4.6 Explain Wide Screen Cinematography.
- 4.7 List types of wide screen cinematography.

- 4.8 Explain Mask frame widescreen cinematography.
- 4.9 List the advantages and disadvantages of different formats of mask frame Techniques?
- 4.10 State the need of Super 35mm format.
- 4.11 List the advantages and disadvantages of Super 35mm format?
- 4.12 Discuss about Anamorphic Cinematography.
- 4.13 List the concepts of Anamorphic Cinematography.
- 4.14 List the advantages and disadvantages of cinemascope format over other 35mm wide screen systems?
- 4.15 Describe techniscope system.
- 4.16 Discuss about Horizontal frame cinematography.
- 4.17 Explain Vista vision.
- 4.18 Explain Technirama.

5. The role& ethics of cinematographer

- 5.1 Explain the role of DOP in Cinematography.
- 5.2 Explain the role of lighting director in cinematography.
- 5.3 Explain the role of rigging in cinematography.
- 5.4 Explain the role of gaffer in cinematography.
- 5.5 Explain the role of a focus puller in cinematography.
- 5.6 Write about roles and techniques of the following personnels in a feature film
 - 5.6.1 Director
 - 5.6.2 Producer
 - 5.6.3 Editor
 - 5.6.4 Audiographer,
 - 5.6.5 Art director
 - 5.6.6 Choreographer
- 5.6.7 Action/Stunt director
 - 5.6.8 Make-up and Costume professionals.
- 5.7 Explain the importance of the departments of the direction, production, editing, audigraphy, art directing, cinematography, action/stunt direction, Make-up and costume department.
- 5.8 Explain the need for co-operation of various departments working for feature film.
- 5.9 Explain the role of camera work as a marvellous vehicle of the imagination of the Director.
- 5.10 Explain about the role of a cinematographer.
- 5.11 List the responsibilities of cinematographer.
- 5.12 Explain responsibilities of cinematographer.
- 5.13 List the work ethics followed by the cinematographer?

COURSE CONTENT

- 1. Concept &Types Of Camera:**The concept of camera as a story teller – The tools of creative cinematography – Different types of camera – Mitchell – Arriflex – Panavision – Different types of Digital Camera’s – Advantages and Disadvantages – Film Formats and Digital Formats – 8mm cameras – 16mm cameras – Super 16 cameras – 35mm cameras Anamorphic system – wide screen system – 70mm cameras – Super 35mm system –Film stocks

- 2. Purpose & Type Of Lighting:** The concept of lighting for cinematography aims of lighting – Good lighting and bad lighting – Position of lights and its effects – Lighting terms – Creative approach through lighting – Selection of light sources, time of shooting, locations, hard or soft lighting for effective image reproduction – Lighting to create mood and atmosphere – Special lighting effects – Control of contrast, tone and clarity – Play of shadows – Composition as an effective tool of creative cinematographer lighting a flat surface – Lighting on object – Understanding the color and tones in relation lighting psychology

High key lighting – Low key lighting – Cameo lighting – Limbo lighting – Rembrandt lighting – Chroma key lighting Large scale lighting – Moon light setup – Day for night effect – Set lighting modern methodology in lighting – Cinematography style Large scale lighting – Fire sets and mystery – Lighting for lighting camp fire scene – Candle flame – Lighting on rain – summer moon light – Dream lighting Tents – Transparency lighting – Exposing a light source – Ring lighting – Lighting for high speed cinematography – lighting for single frame animation – Time slice cinematography time lapse cinematography Cinematography style

- 3. Lens & Attributes:** Factors responsible for the quality image reproduction of a lens system – Resolution of a lens system – Contrast of a lens system – Sharpness and Definition of lens system – Color reproduction of lens system – Different types of lenses used in Cinematography – Study of normal lens – Wide angle lens and its effects – Study of a telephoto lens – Depth of field in relation with these lenses - Focal length and magnification – Depth of focus – Focal plane and flange focal distance – Hyper focal distance – Filters – Glass filters – Gelatin filters – Sand witch filters – Filter factor compensation – Black and White filters – Filters for color cinematography – Color correction and conversion filters – General purpose filters – ND filters – Graduated filters – Polarizing filter - Angle of view Perspective

- 4. CINEMATOGRAPHY AND STYLES:** Study of cinematographers and their styles – Hollywood, European cinematographers – Cinematographers of other countries - contemporary Indian cinematographers Wide Screen Cinematography – Types of wide screen cinematography – Mask frame widescreen cinematography – The advantages and disadvantages of different formats of mask frame techniques – Super 35mm format – Advantages and Disadvantages – Anamorphic cinematography – The concepts – advantages and disadvantages of cinemascope format over other 35mm wide screen systems – Techniscope system – Horizontal frame cinematography – Vista vision – Technirama

- 5. THE ROLE & ETHICS OF CINEMATOGRAPHER:** The role of DOP – The role of a lighting director – The role of rigging – The role of gaffer – The role of a focus puller – Technique of working in a feature film with the Director – Producer – Editor – Audiographer – Art Director – Choreographer – Action/Stunt director – Make-up and Costume professionals – The importance of each department and the reasons for the need for co-operation – The role of Camera work as a marvelous vehicle of the

imagination of the Director The role and responsibilities of a cinematographer –
Work ethics .

REFERENCE BOOKS

1. Contemporary Cinematographers on Their Art Pauline B Rogers The McGraw-Hill Companies 2000- second Edition
2. The Professional Cameraman's Hand Book Sylvia Carlson Harvard University Press 2009 – Fourth Edition
3. Practical Cinematography Paul Wheeler Harvard University Press, 1997- First Edition

Model Blue Print:

S.No.	Chapter/Unit title	No. of periods	Weightage Allocatd	Marks Wise Distribution of Weightage				Question wise Distribution of Weightage				CO's Mapped
				R	U	Ap	An	R	U	Ap	An	
1	Concept & Types Of Camera	10	11	3		8		1		1		CO1
2	Purpose & Type Of Lighting	15	17	3	3	11	10	1	1	2	*	CO2
3	Lens & Attributes	12	14	3	8	3	10	1	1	1	*	CO3
4	Cinematography And Styles	13	17	11	6			2	2			CO4
5	The role & ethics of cinematographer	10	11	8	3		10	1	1		*	CO4, CO5
	Total	60	70+10*	28	20	22	10	6	5	4	1	

Table specifying the scope of syllabus to be covered for unit tests

Unit Test	Learning outcomes to be covered
Unit test-1	1.1 to 3.10
Unit test-2	3.11 to 5.13

DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING MODEL PAPER

Cinematography

UNIT TEST-1

SCHEME: C-20

SUBJ CODE: AG-503

MAX MARKS:40

TIME: 90 Minutes

PART-A

16 Marks

Instructions: 1) Answer all questions

2) First question carries 4 marks, and each question of remaining carries

3marks

1. a) Even the best camera in the world can't capture a perfect picture without good lighting. (True/False) (CO2)
- b) _____ control changes the volume of light entering into camera. (CO1)
- c) Magnification and _____ contributes to Geometric unsharpness.
i) Movement ii) Line focus iii) Distortion iv) Optical density (CO3)
- d) Which lens is able to focus closer to an object than normal lenses?
i) Standard Lens ii) Telephoto Lens iii) Normal Lens iv) Macro lens (CO1)
2. List tools used in cinematography. (CO1)
3. List Special Lighting Effects. (CO2)
4. Define Focal length. (CO3)
5. Define film formats. (CO1)

PART-B

3X8=24Marks

Instructions: 1) Answer all questions

2) Each question carries 8 Marks

3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer

6. a) Explain briefly various digital formats used in photography. (CO1)

Or

- b) Explain briefly about various cameras. (CO1)

7. a) Explain the process of lighting flat surface in cinematography. (CO2)

Or

- b) Explain how to set position of lights in cinematography. (CO2)

8. a) Explain different types of lenses used in Cinematography. (CO3)

Or

b) Explain the role of Contrast of lens system for the quality image reproduction of a lens system.(CO3)

**BOARD DIPLOMA EXAMINATION
DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
MODEL PAPER-END EXAM**

Cinematography

**SCHEME: C-20
MAX MARKS: 80**

**SUBJ CODE:AG-503
TIME: 3HOURS**

PART-A

10X3=30Marks

Note: Answer all questions

1. List different types of cameras. (CO1)
2. What are the aims of lighting in cinematography? (CO2)
3. How to setup lighting to get moon light effect? (CO2)
4. Write short note on Time Slice cinematography. (CO2)
5. What is the usage of normal lens in Photography? (CO3)
6. Define magnification. (CO3)
7. What is techniscope system? (CO4)
8. What are the advantages of cinemascope format over 35 mm wide screen systems? (CO4)
9. List some cinematographers of other countries. (CO4)
10. Write short note on DOP in cinematography. (CO5)

PART-B

5x8=40Marks

Note: Answer all questions

- 11.A. Explain Different types of digital Cameras. (CO1)

OR

- 11.B Explain the Concept of camera as a story teller. (CO1)

- 12.A. Explain how to set lighting to create mood and atmosphere. (CO2)

OR

- 12.B Explain the role of color and tones with respect to lighting psychology. (CO2)

- 13.A. Explain black and white filters in cinematography. (CO3)

OR

13.B Explain about Focal length and magnification. (CO3)

14.A. Explain Mask frame widescreen cinematography. (CO4)

OR

14.B Explain about Contemporary Indian Cinematographers. (CO4)

15.A. Explain the role of lighting director in cinematography. (CO5)

OR

15.B Explain the importance of camera work as a marvellous vehicle of the imagination of the Director. (CO5)

PART-C

1X10=10Marks

16. Explain the setting of lights for shooting video at Mountains. (CO2)

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-504	Advanced 3d Dynamics	5	60	20	80

S.No.	Chapter/Unit Title	No.Of Periods	Co's Mapped
1.	Maya Dynamics	15	CO1
2.	Maya Hair And Fur	15	CO2
3.	Maya Fluids And N-Cloth	10	CO3
4.	Intro To Real Flow	8	CO4
5.	Real Flow Emitter Work Flow	12	CO5
Total Periods		60	

Course Objectives	<ul style="list-style-type: none"> • To know Maya Dynamics • To know Maya Hair And Fur • To familiarize Maya Fluids And N-Cloth • To familiarize Real Flow • To follow Real Flow Emitter Work Flow.
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CO NO	COURSE OUTCOMES
CO1	AG-504.1 Explain Maya Dynamics
CO2	AG-504.2 Apply techniques to create different hair and Fur models with Maya
CO3	AG-504.3 Develop various effects of Maya Fluids And N-Cloth
CO4	AG-504.4 Use various Real flow tools
CO5	AG-504.5 Apply Real Flow Emitter Work Flow concepts

Learning outcomes

1.0 Maya Dynamics

- 1.1 Explain Maya Particles
- 1.2 State the purpose of Particles
- 1.3 Explain Emitters
- 1.4 Explain the Goals of Maya dynamics
- 1.5 Explain Particle Collision
- 1.6 Describe the Texture to The Color Emission
- 1.7 Explain Animating Particles
- 1.8 Describe Rendering Particles

- 1.9 State the purpose of Fields
- 1.10 Use of Volume Fields
- 1.11 List Types of Fields
- 1.12 Explain Advanced in Soft and Rig Body
- 1.13 Describe Working with Rigid Body Constrain
- 1.14 Explain how to Troubleshoot Dynamics

2.0 Maya Hair and Fur:

- 2.1 State the use of Maya Hair
- 2.2 Explain Basic Workflow of Hair
- 2.3 List out Passive Hair Curves
- 2.4 Explain Hair Menus
- 2.5 Describe Hair Presets
- 2.6 Explain Simulation of Hair
- 2.7 Describe Modifying of Hair
- 2.8 Explain Setup Hair Shading
- 2.9 Explain Render Scene with Air
- 2.10 List out various types of Hair Nodes
- 2.11 State the purpose of Maya Fur
- 2.12 Explain Modifying Fur
- 2.13 State the purpose of Fur Tool
- 2.14 Explain Fur Menus
- 2.15 Describe Fur Editors
- 2.16 State the purpose of Fur Nodes
- 2.17 Explain Fur Shading Effects
- 2.18 Explain Fur Samples and Techniques
- 2.19 Describe Render Scene with Fur

3. MAYA FLUIDS AND N-CLOTH

- 3.1 Introduction to Maya Fluids concept
- 3.2 Give the steps to create Fluid Effects
- 3.3 Explain the steps to modify Fluids
- 3.4 Write the steps how to open water effects fluids constrain
- 3.5 Explain about Fluids Texture and Shading With examples
- 3.6 State the purpose of Fluids Effects Node
- 3.7 Describe about Rendering Fluids
- 3.8 Explain the N-Cloth concept
- 3.9 Explain the concept of N-Cloth Collision with examples
- 3.10 Give the steps to Constraining N Cloth
- 3.11 Describe N-Cloth Attribute Presets
- 3.12 Mention the steps how to handle N-Cloth Troubleshooting
- 3.13 State the purpose of Dynamic Plug-In
- 3.14 State the purpose of Physic Plug-in

4. INTRODUCTION TO REAL FLOW

- 4.1 Explain the concept of Real Flow User Interface
- 4.2 Mention Menu bars in Real flow user interface
- 4.3 State the purpose of Timeline
- 4.4 Explain Timeline Control with examples
- 4.5 Describe Layer Window
- 4.6 Explain about Visibility Panel
- 4.7 Explain about Simulation Panel
- 4.8 Describe Real Flow Presets with various examples
- 4.9 Explain various using Real Flow Tools
- 4.10 Explain Real Flow Nodes with examples
- 4.11 Describe the concept Particular System
- 4.12 Explain the steps in Simulation Control
- 4.13 Explain about Dynamic & Animation

5. REAL FLOW EMITTER WORK FLOW

- 5.1 Explain the general Structure of real flow emitter
- 5.2 Describe Particles Emitter with examples
- 5.3 Describe about Grid Emitter Real Wave Nodes
- 5.4 Explain the following splashes in real flow emitter
 - 5.4.1 Object Splash
 - 5.4.2 Crest Splash
- 5.5 Explain about Control Points real flow emitter work flow
- 5.6 State the purpose of Fractional concept
- 5.7 State the purpose of Spectrum concept
- 5.8 Explain about Real Flow Mesh with examples
- 5.9 Explain about Real Flow Hybrid with examples
- 5.10 Explain about Fluid Panel
- 5.11 Explain about Surface Panel
- 5.12 Explain about Displacement Panel
- 5.13 Describe the types of Particle Emitter
- 5.14 Explain about Camera Panel
- 5.15 Explain basic Animation Expressions with examples
- 5.16 Describe the concept of Rendering Work Flow

COURSE CONTENT

1. **Maya Dynamics:** Maya Particles – Overview Of Particles – Emitters – Goals – Particle Collision – Texture To The Color Emission – Animating Particles - Rendering Particles – Fields – Volume Fields – Types Of Fields – Advanced In Soft And Rig Body – Working With Rigid Body Constrains – Troubleshoot Dynamics
2. **Maya Hair And Fur:** Introduction To Maya Hair – Basic Workflow Of Hair – Passive Hair Curves – Hair Menus – Hair Presets – Simulation Of Hair – Modifying Of Hair –

Setup Hair Shading – Render Scene With Air – Hair Nodes – Introduction To Maya Fur – Modifying Fur – For Tool – Fur Menus – Fur Editors – Fur Nodes – Fur Shading Effects – Fur Samples And Techniques – Render Scene With Fur

3. **Maya Fluids And N-Cloth:**Intro To Maya Fluids – Creating Fluid Effects – Modifying Fluids – Open Water Effects Fluids Constrain – Fluids Texture And Shading – Fluids Effects Node – Rendering Fluids – Intro To N Cloth – N-Cloth Collision – Constraining N Cloth – N-Cloth Attribute Presets – N-Cloth Troubleshooting – Dynamic Plug-In. – Physic Plug-in
4. **Intro To Real Flow:** Real Flow User Interface – Menu Bars – Timeline – Timeline Control –Layer Window – Visibility Panel – Simulation Panel – Real Flow Presets – Real Flow Tools Menu – Real Flow Nodes – Particular System – Simulation Control – Dynamic & Animation
5. **Real Flow Emitter Work Flow:** General Structure – Particles Emitter – Grid Emitter Real Wave Nodes – Object Splash – Crest Splash – Control Points – Fractional – Spectrum –Real Flow Mesh – Real Flow HYBRID – The Fluid Panel – Surface Panel & Displacement Panels – Types Of Particle Emitter – The Camera Panel – Basic Animation Expressions – Rendering Work Flow.

REFERENCE BOOKS

1. Mastering in Maya- Eric Keller, Wiley Publisher 2006 - First Edition
2. Autodesk the art of Maya- Lee Lanier, Autodesk Media Entertainment 2007- 4th Edition
3. Dyanamics -Tood Palmer, Wiley Publisher 2010- First Edition

CO-PO/PSO Matrix:

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
AG-504.1	3	2	2	3		1	3	3	1	1
AG-504.2	2	1	1	1	3	2	3	1	3	2
AG-504.3	3	1		1		1	1		1	3
AG-504.4	1	2	2		1	3	2	2		3
AG-504.5	2		2	3	1	2	2	2	1	3
Average	2.2	1.5	1.75	2	1.6	1.8	2.2	2	1.5	2.4

3=Strongly mapped , 2=moderately mapped, 1=slightly mapped

Model Blue print

S.No.	Chapter/Unit title	No.of periods	Weightage Allocated	Marks Wise Distribution of Weightage				Question wise Distribution of Weightage				CO's Mapped
				R	U	Ap	An	R	U	Ap	An	
1	Maya Dynamics	15	14	3	11			1	2			CO1

2	Maya Hair and Fur	15	17	6	11		10	2	2		*	CO2
3	Maya Fluids And N-Cloth	10	14	3	11			1	2			CO3
4	Intro To Real Flow	8	11	3	8			1	1			CO4
5	Real Flow Emitter Work Flow	12	14	3	11		10	1	2		*	CO5
	Total	60	70+10*	18	52		10	6	9		1	

Table specifying the scope of syllabus to be covered for unit tests

Unit Test	Learning outcomes to be covered
Unit test-1	From 1.1 to 2.19
Unit test-2	From 3.1 to 5.16

**DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING
MODEL PAPER
Advanced 3d Dynamics
UNIT TEST-1**

**SCHEME: C-20
MAX MARKS: 40**

**SUBJ CODE:AG-504
TIME: 90Minutes**

PART-A

16 Marks

Instructions:1) Answer all questions

2) First question carries 4marks, and each question of remaining carries 3marks

1. a) _____ emit particles from a position in the workspace (CO1)
- b) Fields are forces used to animate the motion of static objects– (True /False) (CO1)
- c) XGen stands for _____ (CO2)
- d) Which of the Following is the Fur Nodes
 - a) **Light Shape Node** b) Light Rear Node c) XNode d) YNode (CO2)

2) Define Particle Collision. (CO1)

3) What are Animating Particles (CO1)

4) State the purpose of shading effects (CO2)

5) List any three fur techniques (CO2)

PART-B

3 X 8=24Marks

Instructions: 1) Answer all questions

2) Each question carries 8 Marks

3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer

6.A. Describe the Texture to The Color Emission (CO1)

(Or)

- 6.B. Describe Working with Rigid Body Constrains (CO1)
- 7.A. Explain how to Troubleshoot Dynamics (CO1)
- (Or)
- 7.B. Explain Simulation of Hair (CO2)
8. A Explain Render Scene with Hair (CO2)
- (Or)
- 8.B. Explain Fur Menus (CO2)

MODEL PAPER –END EXAMINATION
Advanced 3d Dynamics

SCHEME: C-20
MAX MARKS:80

SUBJ CODE:AG-504
TIME: 3HOURS

PART - A

Answer all the Questions. Each Question Carries 3 marks

21. Define Emitter (CO1)
22. State the use of Volume Field. (CO1)
23. List out various types of Hair Nodes (CO2)
24. Write about Fur Tool (CO2)
25. What is Maya Fur (CO2)
6. State the purpose of Dynamic Plug-In. (CO3)
7. What is Rendering Fluids? (CO3)
8. Write about Timeline concept. (CO4)
9. Define Spectrum. (CO5)
10. Explain briefly object splash (CO5)

PART – B

Answer all the Questions. Each Question Carries 8 marks

- 11.A. Explain Maya Particles (CO1)
- OR
- B. Explain Advanced in Soft and Rigid Body (CO1)
- 12.A Explain Basic Workflow of Hair (CO2)
- OR
- B. Describe Modifying of Hair (CO2)
- 13.A. Explain the steps how to modify Fluids in MAYA. (CO3)

OR

B. Explain the concept of N-Cloth Collision with examples(CO3)

14. A. Explain about Menu bars in Real flow user interface. (CO4)

OR

B. Describe Real Flow Presets with various examples. (CO4)

15. A. Explain the general Structure of real flow emitter. (CO5)

OR

B. Explain about Real Flow Mesh with examples (CO5)

PART-C

1X10=10Marks

16. Explain basic Animation Expressions with examples (CO5)

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-505	Visual EFX and Composting Techniques	5	75	20	80

S.No.	Chapter/Unit Title	No.of Periods	CO's Mapped
1.	Evolution of Visual Effects	15	CO1
2.	Basic Of Rotoscopic& Composting Techniques	15	CO2
3.	Keying Techniques	15	CO3
4.	Match Moving Tracking Techniques	15	CO4
5.	Stereoscopic Techniques	15	CO5
Total Periods		75	

Course Objectives	<ul style="list-style-type: none"> • Understand the work flow of visualeffectsand various level visual effectstechniques • Handling various visual effectssoftware's • Expert in rotoscopic technique and keying&tracking • Understanding match move and tracking technique • Handling liveprojects
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CO NO		COURSE OUTCOMES
CO1	AG-505.1	Describe basics of Visual Effects and Special Effects.
CO2	AG-505.2	Apply Rotoscopic and Compositing techniques w.r.t. Mocha.
CO3	AG-505.3	Use Keying techniques and techniques for fine details
CO4	AG-505.4	Apply tools like Transformation, tracking, editors
CO5	AG-505.5	Apply Stereoscopic techniques , cameras and conversion mechanisms.

CO-PO/PSO MATRIX

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
AG-505.1	3	1	2	1	2		1	2	1	1
AG-505.2	1	3	3	3	1	3	1	3	3	1
AG-505.3	1	2	3	2	1	3	1	3	3	1
AG-505.4	3	3	3	3	1	3	1	2	3	1
AG-505.5	3	3	3	3	1	3	1	2	3	1
Average	2.2	2.4	2.8	2.4	1.2	3	1	2.8	2.6	1

3=Strongly mapped , 2=moderately mapped, 1=slightly mapped

Learning Outcomes

1.0 Evolution of Visual Effects

- 1.1 What is VFX?
- 1.2 State the need of VFX.
- 1.3 Give the history of VFX.
- 1.4 Write the applications of VFX.
- 1.5 List and Explainvarious techniques used in VFX in olden days.
- 1.6 List and Explain Hollywood techniques of visual effects.

- 1.7 Write about various Indian techniques of visual effects.
- 1.8 Explain Land marking visual studios.
- 1.9 Explain screening of various movies
- 1.10 Explain VFX Professional Development with an example.
- 1.11 What is VFX pipeline?
- 1.12 Explain VFX pipe line.
- 1.13 List and Explain Pre- production methods used in VFX shooting
- 1.14 Explain VFX Artist movie making.
- 1.15 Explain VFX screening in Artist movie making?
- 1.16 Explain applying special effects in VFX Movie making.

2.0 Basic Of Rotoscopic& Compositing Techniques:

- 2.1 Define Compositing.
- 2.2 Define Rotoscoping.
- 2.3 State the applications of Compositing.
- 2.4 What is Mocha?
- 2.5 Explain Mocha interface.
- 2.6 List Mocha preferences.
- 2.7 List and Explain various Mocha tools.
- 2.8 List and Explain The Viewer Controls of Mocha.
- 2.9 State the purpose of various viewer controls in mocha.
- 2.10 State purpose of timeline controls in mocha.
- 2.11 List various timeline controls in mocha.
- 2.12 Explain the purpose of various timeline controls in mocha.
- 2.13 What is tracking the spline?
- 2.14 List layer properties in Mocha.
- 2.15 List types of compositing.
- 2.16 Explain 2D Compositing.
- 2.17 List and explain ethics of compositing.
- 2.18 List and Explain Blending techniques
- 2.19 Explain transforming in 2D.
- 2.20 Explain Color correction.
- 2.21 Explain the process of making Tonal adjustment compositing workflow?
- 2.22 List and Explain quality checking techniques

3.0 Keying Techniques

- 3.1 What is Keying ?
- 3.2 State the uses of keying.
- 3.3 State the purpose of Nuke Keys.
- 3.4 List and explain Nuke Keys?
- 3.5 Demonstrate the usage of Primate with an example?
- 3.6 State the need of key light.
- 3.7 Explain the process of keying with key light.
- 3.8 Explain the keying workflow.
- 3.9 List and explain Various keying techniques.
- 3.10 Describe the key light with ultimate
- 3.11 Explain keying plug .

- 3.12 Explain keying in multiple softwares.
- 3.13 List and Explain various keying techniques for fine details.

4.0 Match Move & Tracking Techniques

- 4.1 What is the purpose of match move?
- 4.2 What is the purpose of Boujou interface?
- 4.3 List components of Boujou interface.
- 4.4 Explain the components of Boujou interface?
- 4.5 Explain different menus in Boujou Menubar.
- 4.6 List and Explain tools in tool bar in Boujou
- 4.7 Explain 2D mode tracking.
- 4.8 Explain 3D mode tracking.
- 4.9 Differentiate 2d and 3d tracking.
- 4.10 List and Explain track features.
- 4.11 List and Explain import sequences.
- 4.12 What is camera solve and state its need.
- 4.13 List and explain solve tools.
- 4.14 List and explain transformation tools.
- 4.15 Explain target tracks in detail.
- 4.16 List and Explain Graph Editors.
- 4.17 Explain export camera Solve.
- 4.18 List Trackers
- 4.19 Define Nuke
- 4.20 Explain Features Of Trackers.
- 4.21 Explain how to use trackers in Nuke
- 4.22 Define Point tracking
- 4.23 Define Planar Tracking.
- 4.24 Explain Point tracking.
- 4.25 Explain Planar tracking
- 4.26 Explain the process of importing tracking data from other softwares.
- 4.27 Explain Advanced Tracking workflow.
- 4.28 List and Explain Advanced Tracking Techniques

5.0 Stereoscopic Techniques

- 5.1 What is stereoscopy?
- 5.2 Mention types of stereoscope.
- 5.3 List and Explain types of dimensional Stereoscopy techniques.
- 5.4 List and explain category in stereoscopy with all subcategories.
- 5.5 What is stereo photography?
- 5.6 List and explain various olden stereo scope viewers.
- 5.7 Define stereographic projection.
- 5.8 Explain process of stereographic projection.
- 5.9 List and explain various types of stereo cameras.
- 5.10 Distinguish between types of stereo cameras.
- 5.11 List types of stereo display.
- 5.12 Explain types of stereo display.
- 5.13 List and Auto Stereoscopy Stereo Tools In Nuke
- 5.14 Explain Stereo Compositing Workflow

- 5.15 Define Stereo Conversion?
- 5.16 Explain process of Stereo Conversion.
- 5.17 Define Deep Compositing.
- 5.18 Explain process of deep Compositing.
- 5.19 Explain Quality Control of Stereo Conversion.
- 5.20 Explain Debugging of Stereo Conversion.

COURSE CONTENT

1. Evolution of Visual Effects:

History of VFX – Techniques used in VFX oldendays – Hollywood techniques of visual effects – Indian techniques visual effects – Land marking Visual studios – Screening of various movies–VFX Professional Development– VFX growth Introduction to VFX pipeline – Pre production – Methods used in VFX shooting – Famous visual VFX Artist Movie making screening –Special Effects–

2. Basic Of Rotosopic& Compositing Techniques:

Introduction To Mocha – Mocha Interface – Mocha Preferences – Mocha Tools – The Viewer Controls – The Timeline Controls – Layer Properties – Tracking The Spline – What Is 2d Compositing – Ethics Of Compositing – Blending Techniques – Transforming In 2d – Color Correction – Making Tonal Adjustments Compositing Workflow – Quality Checking Techniques

3. Keying Techniques

Introduction To Nuke Keys – Usage Of Primate– Keying With Key Light – Keying Workflow – Various Keying– Key Light With Ultimate – Keying Plug- in Advanced– Keying in multiple software –Techniques For Fine Details

4. Match Move &Tracking Techniques

Boujou Interface – Menu Bar – Tool Bar – 2D& 3dtracking – View – Track Features – Import Sequences – Camera Solve – Solve Tools – Transformation Tools – Target Tracks – Graph Editors – Export Camera Solve – Features Of Trackers – – Trackers In Nuke – Point And Planar Tracking – Importing TrackingData From Other Software’s – Advanced Tracking Workflow – Advanced Tracking Techniques

5. Stereoscopic Techniques

What Is Stereoscropy – Types Of Dimensional – Category In Stereoscropy – Stereo Photography –Olden Stereoscope Viewers –Stereographic Projection – Types Of Stereo Camera – Type Of Stereo Display –Auto Stereoscropy Stereo Tools In Nuke – Stereo Compositing Workflow – Stereo Conversion –Deep Compositing – Quality Control And Debugging Of Stereo Conversion

REFERENCE BOOKS

1. The Art & Science Of Digital Compositing, by Ron Brinkmann, Morgan Kaufmann Publishers
2. Match Moving, by TIM DOBBERT, SYBEX Publisher
3. Digital Compositing, by Ron Brinkmann, Academic Press
4. https://borisfx.com/support/documentation/mocha/6.0.0/#_the_timeline_controls

Model Blue print

S.No.	Chapter/Unit title	No. of periods	Weightage Allocated	Marks Wise Distribution of Weightage				Question wise Distribution of Weightage				CO's Mapped
				R	U	A p	A n	R	U	A p	A n	
1	Evolution of Visual Effects	15	14	3	11			1	2			CO1
2	Basic Of Rotoscopic & Composting Techniques	15	14	3	3	8	10	1	1	1	*	CO2
3	Keying Techniques	15	14	3	11			1	2			CO3
4	Match Move & Tracking Techniques	15	14	3	3	8	10	1	1	1	*	CO4
5	Stereoscopic Techniques	15	14	3	3	8	10	1	1	1	*	CO5
	Total	75	70 + 10(*)					5	7	3	1	

Note: Part-C: 10 marks single analytical question may be chosen from any or combination of starred chapters

Table specifying the scope of syllabus to be covered for unit tests

Unit Test	Learning outcomes to be covered
Unit test-1	From 1.1 to 3.7
Unit test-2	From 3.8 to 5.20

DIPLOMA IN 3D ANIMATION AND GRAPHICS ENGINEERING MODEL PAPER

Visual EFX and Composting Techniques

UNIT TEST-1

SCHEME: C-20SUBJ CODE:AG-505

MAX MARKS:40

TIME: 90Minutes

PART-A

16Marks

Instructions: 1) Answer all questions
2) First question carries 4marks, and each question of remaining carries 3marks.

- 1.a) VFX stands for ----- (CO1)
- b) Mocha is an interface [True/False] (CO2)
- c. Which of the following is a valid timeline controls in Mocha? (CO2)
- a)Current Frame b) Trace c) Stabilized d)Overlays
- d). The special compositing effect that happens when we take a part of a video and make it transparent is termed as _____ (CO3)
- 2) Write any three applications of VFX (CO1)
- 3) Define Compositing (CO2)
- 4) State the purpose of timeline controls in Mocha (CO2)
- 5) Write any three uses of Keying (CO3)

PART-B

3X8=24Marks

Instructions: 1) Answer all questions
2) Each question carries 8 Marks
3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

6. a) Explain various techniques used in VFX in olden days (CO1)
- Or
- b) Explain VFX Artist movie making. (CO1)
7. a) Explain 2D Compositing (CO2)
- Or
- b) List and explain ethics of compositing. (CO2)
8. a) Demonstrate the usage of Primate with an example? (CO3)
- Or
- b) Explain the process of keying with key light. (CO3)

VISUAL EFX AND COMPOSTING TECHNIQUES

SCHEME: C-20SUBJ CODE:AG-505

MAX MARKS:80

TIME: 3HOURS

PART-A10X3=30Marks

Note: Answer all questions

1. State the need of VFX. (CO1)
2. What is VFX pipeline? (CO1)
3. Define Rotoscoping (CO2)
4. State any three applications of Compositing. (CO2)
5. Write the purpose of Keying. (CO3)
6. State the need of Key light. (CO3)
7. What is match move? (CO4)
8. List any three components of Boujou interface. (CO4)
9. Define Stereoscopy. (CO5)
10. List any three olden stereo scope viewers. (CO5)

PART-B

5x8=40Marks

Note: Answer all questions

11. A.Explain the history of VFX in detail. (CO1)

OR

11. B. Explain various Hollywood techniques of visual effects (CO1)

- 12.A Explain Any four tools in Mocha with examples (CO2)

OR

- 12.B.Explain the process of making Tonal adjustment compositing workflow? (CO2)

- 13.A.Explainanyfour Nuke keys with examples (CO3)

OR

- 13.B. Explain keying in multiple softwares. (CO3)
- 14.A. Differentiate 2D and 3D tracking in detail (CO4)
OR
- 14.B. Explain Point and Planar tracking. (CO4)
- 15.A. Explain category in stereoscopy with all subcategories. (CO5)
OR
- 15.B. Distinguish between any two types of stereo cameras. (CO5)

PART-C

1X10=10Marks

16. Explain the process of Creating a VFX application To demonstrate stereographic projection with an example video . (CO5)

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-506	3D RIGGING AND ANIMATION LAB	3	45	40	60

S No	Chapter/ Unit Title	No. of Periods	COs Mapped
1.	Rigging Menus & Editors Skelton Setup & Props rigging Robot Rigging	9	CO1
2.	Character Rigging Work Flow Quadruped Rigging Setup Advance Rigging Techniques	12	CO2

3.	Animation Menus& Editors Basic Animation Techniques	6	CO3
4.	Linear Animation Techniques Non-Linear Animation Techniques	12	CO4
5	Facial Animation With LipSync	6	CO5
	Total	45	

GUIDE LINES:

- ☐ All the exercises provided in the list of practicals should be completed and submitted during the semester examination.
- ☐ In order to develop skill in mastering creativity, every student should be made to practice thoroughly.
- ☐ The external examiners are requested to ensure that a single practical oriented question should not be given to more than three students while admitting a batch of 30 students during Board Examination.

Required Infrastructure(Software, Hardware and other Equipment) to be procured as per C-20:

SNO	Hardware / Equipment Needed	Software Needed
1	Desktop Systems: Configuration: 33. Processor :: AMD Ryzen 9 3900X Or any other equivalent intel/Motorola etc.. processor or Above 34. Mother Board: AMD 400/500 or its equivalent or above 35. RAM: 8GB(or above) dual channel DDR4 36. HDD: 500GM (SSD)/1TB(or above) 37. Graphics Card: Aorus GeForce RTX 2080 Ti Xtreme (or equivalent) 38. Monitor: 17" or above 39. Multimedia Devices like Mic, Head Phones / Speakers , USB Web camera or USB Digital Video Camera 40. Color Photo Scanner and Printer	1. Operating System: Microsoft Windows 10 professional-64 bit (Minimum) 2.Animation and Graphics Software p. Adobe master collection cs6 (or Above) q. Autodesk MAYA r. Autodesk 3DS MAX.

CO No	COURSE OUTCOMES
	After completion of this course student will be able to

CO 1	AG-506.1	Create various Joints for Leg, spine, hand, robotic Skelton, rigging controls ,Controls, usage of Hierarchy Editor, Connection Editor, prop rigging
CO 2	AG-506.2	Create Human Skelton, Usage of IK Skelton Generator, usage of stretch and squash, script Editor, practice on quadruped rigging setup
CO 3	AG-506.3	Developing Ball Bouncing animations using graph Editor and Trax editor etc..
CO 4	AG-506.4	Apply poses, animations motion flow, working with animation shots, Tangents, creating Animation Clip, edit Clips
CO 5	AG-506.5	Developing animations with Various facial controls, dialogue with Lip Sync, play back adjusting

CO-PO/PSO MATRIX

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
AG-506.1	1	3	3	2	2	2	2	2	2	
AG-506.2	2	3	1	2	1	2	1	1	2	2
AG-506.3	1	2	2	2	2	1	1	2	2	3
AG-506.4	2	3	3	2	3	3	2	2	3	2
AG-506.5	2	2	2	2	3	3	2	1	3	1
Average	1.8	2.6	2.2	2	2.2	2.2	1.6	1.6	2.4	2

3=Strongly mapped, 2=moderately mapped, 1=slightly mapped

Learning outcomes

1. Create the human rig with proper control & skinning for given model CO1.
2. Create Joints for Leg, Hand and Spine- CO1
3. Create the facial rig for given 3d character with GUI controls. CO1
4. Create the vehicle rig with dynamic controls for given auto mobilemodels.CO2
5. Crete a character using various Deformers . CO2
6. Rig the given quadruped character with the proper control withskinning. -CO2
7. Create the thread mill walk cycle for 5sec with the given riggedcharacter-CO2
8. Create Ball bouncing animation -CO3
9. Develop a scene with Graph Editor -CO3
10. Match the footage of video sequence with given riggedcharacter. - CO4
11. Create a audio track with grouping & merging Clips -CO4
12. Create facial expression animation for given rigged character for6sec -CO4
13. Create a simple walk cycle using 9 poses -CO4
14. Create lip-sync for the character with given referencefootages -CO5
15. Create lip-sync for the Santa Claus head with mouth animation. -CO5

The competencies and key competencies to be achieved by the student

S.N o.	Name of the experiment	Objectives	Key Competencies

1	Create the human rig with proper control & skinning for given model	❖ Identify controls to rig characters	❖ Use various controls to rig characters ❖ Use different controls for skinning character ❖ Apply different setdrivens
2	Create Joints for Leg, Hand and Spine	❖ Identify mechanisms to create joints	❖ Use about various mechanisms to create joints ❖ Use different Joints for legs, hands, spine
3	Create the facial rig for given 3d character with GUI controls.	❖ Identify GUI controls for facial rigging	❖ Use various mechanism to do facial rigging for 3d character ❖ Use different controls for rigging 3d characters
4	Create the vehicle rig with dynamic controls for given auto mobilemodels.	❖ Identify dynamic controls to rig a vehicle or motor	❖ Use different dynamic controls to rig a vehicle ❖ Use various controls to rig mobile device
5	Crete a character using various Deformers	❖ Identify different deformers (lattice, Wrap, Cluster, Sculpt) & Non-Linear Deformers (Bend, Squash, sine, Twist, Wave, Blend Shape) to create a character	❖ Use different deformers (lattice, Wrap, Cluster, Sculpt) to create a character ❖ Use Non-Linear Deformers (Bend, Squash, sine, Twist, Wave, Blend Shape)
6	Rig the given quadruped character with the proper control withskinning.	❖ Identify controls for rigging quadruped character like Dog, car	❖ Use about controls for rigging quadruped character like Dog ❖ Use different controls to rig quadruped vehicle like, car
7	Create the thread mill walk cycle for 5sec with the given riggedcharacter	❖ Identify controls for rigging moving character thread mill	❖ Use controls for rigging moving character like thread mill ❖ Use different positions and speeds
8	Create Ball bouncing	❖ Identify animation techniques to bounce	❖ Use various animation techniques to bounce ball

	animation	a ball	<ul style="list-style-type: none"> ❖ Practice on various directions ❖ Identify angles , motions, height
9	Develop a scene with Graph Editor	<ul style="list-style-type: none"> ❖ Identify controls in Graph editor to make different curves in a scene 	<ul style="list-style-type: none"> ❖ Use mechanisms in Graph editor to make different curves in a scene ❖ Practice different curves ❖ Practice keys
10	Match the footage of video sequence with given rigged character.	<ul style="list-style-type: none"> ❖ Identify mechanism to match footage of video sequence with given character 	<ul style="list-style-type: none"> ❖ Use control mechanism to match footage of video sequence with given character ❖ Practice on different videos
11	Create audio track with grouping & merging Clips	<ul style="list-style-type: none"> ❖ Identify controls to merge and group different audio tracks as one audio track 	<ul style="list-style-type: none"> ❖ Use of controls to merge and group different audio tracks as one audio track ❖ Practice on merging and grouping video clips
12	Create facial expression animation for given rigged character for 6sec	<ul style="list-style-type: none"> ❖ Identify controls to merge and group different audio tracks as one audio track 	<ul style="list-style-type: none"> ❖ Use different controls for facial expression animation for rigged character ❖ Practice different expressions
13	Create a simple walk cycle using 9 poses	<ul style="list-style-type: none"> ❖ Identify controls for walk cycle using different poses 	<ul style="list-style-type: none"> ❖ Use poses and create walk cycles ❖ Practice using 9 poses
14	Create lip-sync for the character with given reference footages	<ul style="list-style-type: none"> ❖ Identify controls to create lip sync for a character 	<ul style="list-style-type: none"> ❖ Use various lip sync mechanisms to apply on character ❖ Practice on lip sync controls ❖ Using references ❖ Using footages
15	Create lip-sync for the Santa Claus head with mouth animation.	<ul style="list-style-type: none"> ❖ Identify controls to create lip sync on head of a character for mouth animation 	<ul style="list-style-type: none"> ❖ Use different lip sync controls to create Santa Claus head with mouth animation ❖ Use Head and Mouth and lip sync controls

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-507	COMPOSITING Lab	03	45	40	60

S No	Chapter/ Unit Title	No. of Periods	COs Mapped
1.	Evolution of Visual Effects	3	CO1
2.	Basic Of Rotoscopic& Compositing Techniques	15	CO2
3.	Keying Techniques	6	CO3
4.	Match Moving Tracking Techniques	12	CO4
5.	Stereoscopic Techniques	9	CO5
	Total	45	

COURSE OBJECTIVES	<p>Upon completion of the course the student shall be able to</p> <p>14. Install VFX software and configure it</p> <p>15. Enhance VFX applications using tools and techniques in Mocha interface</p> <p>16. Implement Keying techniques and Nuke Keys</p> <p>17. Enhance VFX applications by applying concepts in Boujou interface</p> <p>18. Implement stereoscopic projections using stereoscopic techniques</p> <p>19. Implement projection mapping using MAYA.</p>
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CO No	COURSE OUTCOMES
CO 1	AG-507.1 Understand the evolution of Visual Effects
CO 2	AG-507.2 Develop VFX effects using Rotoscoping and Compositing Techniques
CO 3	AG-507.3 Develop VFX effects using Keying Techniques
CO 4	AG-507.4 Develop VFX effects using Match Moving Tracking Techniques
CO 5	AG-507.5 Develop VFX effects using Stereoscopic Techniques

CO-PO/PSO MATRIX

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
AG-507.1	3	1	1	1	2		1	1	1	1
AG-507.2	1	3	3	3	1	3	1	3	3	1
AG-507.3	1	2	3	2	1	3	1	3	3	1
AG-507.4	3	3	3	3	1	3	1	2	3	1
AG-507.5	3	3	3	3	1	3	1	2	3	1
Average	2.2	2.4	2.6	2.4	1.2	3	1	2.8	2.6	1

3=Strongly mapped , 2=moderately mapped, 1=slightly mapped

GUIDE LINES:

- ☐ All the exercises provided in the list of practical's should be completed and submitted during the semester examination.
- ☐ In order to develop skill in mastering creativity, every student should be made to practice thoroughly.
- ☐ The external examiners are requested to ensure that a single practical oriented question should not be given to more than three students while admitting a batch of 30 students during Board Examination.

Required Infrastructure(Software, Hardware and other Equipment) to be procured as per C-20:

SNO	Hardware / Equipment Needed	Software Needed
1	<p>Desktop Systems:</p> <p>Configuration:</p> <p>41. Processor :: AMD Ryzen 9 3900X Or any other equivalent intel/Motorola etc.. processor or Above</p> <p>42. Mother Board: AMD 400/500 or its equivalent or above</p> <p>43. RAM: 8GB(or above) dual channel DDR4</p> <p>44. HDD: 500GM (SSD)/1TB(or above)</p> <p>45. Graphics Card: Aorus GeForce RTX 2080 Ti Xtreme (or equivalent)</p> <p>46. Monitor: 17" or above</p> <p>47. Multimedia Devices like Mic, Head Phones / Speakers , USB Web camera or USB Digital Video Camera</p> <p>48. Color Photo Scanner and Printer</p>	<p>1. Operating System: Microsoft Windows 10 professional-64 bit (Minimum)</p> <p>2.Animation and Graphics Software</p> <p>s. Adobe master collection cs (or Above)</p> <p>t. Autodesk MAYA</p> <p>u. Autodesk 3DS MAX.</p>

Learning Outcomes

1. Install the VFX related software and Configure it.
2. Demonstrate tracked spline tool in Mocha to speed up shape creation .
3. Demonstrate Mocha tools with real time scenarios

4. Demonstrate Blending Techniques in Mocha

5. Create the rotoscopic for character to changing the dress color.

6. Create Track, keying & composite given footages using mocha nuke.

7. Composite the green matte footage with given main footages using nuke.

8. Demonstrate Keying techniques for fine details

9. Demonstrate tools in Boujou toolbar
10. Demonstrate menus in Boujoumenubar

11. Create Match move using boujo & composite with Maya.

12. Import tracking data from other softwares

13. Create the title effect & logo animation in after effects.

14. Create the 3d composite Using Nuke for layer renders.

15. Create 3d camera movement to footage using projection mapping using Maya & nuke.
16. Create dual role effects on a character and use deep compositing..

17. Create an application demonstrating stereographic projection

18. Demonstrate Debugging of stereo conversion

The competencies and key competencies to be achieved by the student

S.No.	Name of the experiment	Objectives	Key Competencies
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1	Install the VFX related software and Configure it.	Understand VFX and Identify various VFX related software	<ul style="list-style-type: none"> ❖ Identify VFX related software ❖ Install the latest version ❖ Configure the latest version ❖ Test the software
2	Demonstrate tracked spline tool in Mocha to speed up shape creation and reduce manual key frames	Practice the usage of tracked spline tool in Mocha interface	<ul style="list-style-type: none"> ❖ Implement the tracked spline tool for speed up of shape creations ❖ Implement the tracked spline tool for reducing manual delays.
3	Demonstrate Mocha tools with real time scenarios	Use various tools used in Mocha	<ul style="list-style-type: none"> ❖ Apply various Mocha tools to enhance VFX applications
4	Demonstrate Blending Techniques in Mocha	Understand various blending techniques	<ul style="list-style-type: none"> ❖ Apply blending tools in Mocha to enhance VFX applications
5	Create the rotoscopic for character to changing the dress color.	Use rotoscopiccolor change mechanism	<ul style="list-style-type: none"> ❖ Implement rotoscopic mechanism ❖ Apply color schemes
6	Create Track, keying & composite given footages using mocha nuke.	Demonstrate Tracking, Keying and Composite mechanisms	<ul style="list-style-type: none"> ❖ Implement Tracking ❖ Implement Keying ❖ Implement Compositing Using Mocha interface
7	Composite the green matte footage with given main footages using nuke.	Compositing mat footages.	<ul style="list-style-type: none"> ❖ Apply compositing on main footages with green matte footage. ❖ Using Nkue.
8	Demonstrate Keying techniques for fine details	Practice d Keying techniques	<ul style="list-style-type: none"> ❖ Apply Keying techniques for making fine details
9	Demonstrate tools in Boujou toolbar	Use various tools in Boujou toolbar	<ul style="list-style-type: none"> ❖ Use Boujou toolbar for creating VFX applications
10	Demonstrate menus in Boujoumenubar	Identify various menus in Boujoumenubar	<ul style="list-style-type: none"> ❖ Use Boujoumenubar for creating VFX applications

11	Create Match move using boujo& composite with Maya.	Apply Match Move concept	<ul style="list-style-type: none"> ❖ Implement Match Move ❖ Implement Composite Using Maya
12	Import tracking data from other software	Working with importing of Tracking data.	<ul style="list-style-type: none"> ❖ Import tracking data from various softwares
13	Create the title effect & logo animation in after effects.	Creating after effects	<ul style="list-style-type: none"> ❖ Create title effect ❖ Create logo ❖ Animate the effect.
14	Create the 3d composite Using Nuke for layer renders.	Understand 3D Composite using Nuke	<ul style="list-style-type: none"> ❖ Implement 3D Composition ❖ Using Nuke ❖ Creating for layer renders
15	Create 3d camera movement to footage using projection mapping using Maya& nuke.	Demonstrate projection mapping	<ul style="list-style-type: none"> ❖ Using Maya and Nuke ❖ Applying projection mapping. ❖ Using 3D camera movement ❖ Working with footages using cameras.
16	Create dual role effects on a character	Work with dual roles.	<ul style="list-style-type: none"> ❖ Using radiosopic effect. ❖ Create dual roles of a character. ❖ Apply deep compositing.
17	Create an application demonstrating stereographic projection	Understand stereographic projection	<ul style="list-style-type: none"> ❖ Implement Stereographic projection
18	Demonstrate Debugging of stereo conversion	Understand Debugging in stereo conversion	<ul style="list-style-type: none"> ❖ Use debugging mechanisms of stereo conversion

Life Skills

Course Code	Course Title	No. of Periods/Week	Total No. of Periods	Marks for FA	Marks for SA
Common 508	Life Skills	3	45	40	60

S. No.	Unit Title	No of Periods	COs Mapped
1	Attitude	4	CO1
2	Adaptability	4	CO1, CO2
3	Goal Setting	4	CO1, CO2, CO3
4	Motivation	4	CO1, CO2, CO3
5	Time Management	4	CO2
6	Critical thinking	4	CO3
7	Creativity	4	CO3
8	Problem Solving	5	CO3
9	Team Work	4	CO4
10	Leadership	4	CO4
11	Stress Management	4	CO4
Total Periods		45	

	To understand the importance of Life skills for acceptable, sustainable and ethical behaviour in academic, professional and social settings
	To exhibit language competence appropriate to acceptable social and professional behaviour.

CO No.	Course Outcomes
CO1	Demonstrates positive attitude and be able to adapt to people and events
CO2	Fixes personal and professional goals and manages time to meet targets
CO3	Exhibits critical and lateral thinking skills for problem solving.

	To demonstrate time management, stress management, team skills, problem solving ability to manage oneself in academic, professional and social settings.
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CO4	Shows aptitude for working in teams in a stress free manner and sometimes/ very often/ mostly display leadership traits.
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CO-PO Matrix

Course Code Common-508	Course Title: English Number of Course Outcomes: 4			No. of Periods: 45	
POs	Mapped with CO No.	CO Periods Addressing PO in Column 1		Level of Mapping (1,2,3)	Remarks
		Number	Percentage %		
PO1		Not directly applicable for Life Skills Course. However activities that use content and situations from academic, professional and social settings relevant to the Programme shall be exploited for triggering thought and interaction in the Course.			
PO2					
PO3					
PO4					
PO5	CO1, CO2, CO3, CO 4	11	25%		>60%: Level 3
PO6	CO1, CO2, CO3, CO4	27	45%		16 -59%: Level 2
PO7	CO1, CO2, CO3, CO4	7	30%		Up to 15%: Level 1

Level 3 – Strongly Mapped
Level 2- Moderately Mapped
Level 1- Slightly Mapped

Mapping Course Outcomes with Program Outcomes:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
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CO 1					✓	✓	✓
CO 2					✓	✓	✓
CO3					✓	✓	✓
CO4					✓	✓	✓

Blue Print for evaluation based on Course Outcomes for SA:

Note: Every Activity based Question that focuses on COs and responses as exhibited through communication has to be given marks for the following parameters

- Clarity of Thinking as Exhibited through Content
- Features of Etiquette

***Rubric Descriptors ‘Outstanding/ Very Good/ Good/ Satisfactory/ Poor’ levels of Competence**

Level of Competence	Parameters of Assessment	
	Clarity of thinking as exhibited through content	Features of etiquette
Outstanding 10	<p>Thinking is extremely logical and suggested course of action is feasible</p> <p>Shows creativity and uniqueness</p> <p>Exhibits expert use of expression (organizational devices and discourse markers) that denote clarity in thought.</p>	<p>Exhibits courtesy to all most appropriately with confidence</p>
Very Good 8/9	<p>Thinking is clear and logical</p> <p>Suggested course of action is feasible</p> <p>Shows traces of creativity</p> <p>Exhibits good expression (organizational devices and discourse markers) that denote clarity in thought.</p>	<p>Exhibits courtesy to all to a considerable level.</p>

Good 6/7	Thinking is clear and logical most of the time. Lacks creativity or out of the box thinking as expressed through content.	Exhibits courtesy / politeness to an acceptable level.
Satisfactory 4/5	Thinking is logical; However expressing content is disjointed and disorganized.	Has courtesy but often fumbles with language.
Poor 3 or less than 3	Thoughts as expressed through content are incoherent. Language skills are very limited.	Fails to show courtesy to others.

Blue Print for evaluation based on Course Outcomes for SA of each student:

Note: Marks are awarded for each student as per the Rubric descriptors.

S N o .	Questions based on Course Outcomes	Periods Allocat ed for practic al work	Max Mark s	Poor >3	Satisfact ory 4 /5	Good 6/7	Very Good 8/9	Outstandi ng 10
1	Short presentation on GOALS with Timeline and Action Plan	12	10					
2	State what you will do in the given situation (Assesses adaptability and critical thinking skills, leadership, team skills)	12	10					
3	In how many different and creative way can you use _____ (Object) other than its primary use	8	10					
4	What solutions can you think of for _____ problem.	13	10					
	Total	45	60					

Note: The marks that are awarded for the student for 40 to be increased proportionally for 60.

Learning Outcomes

1. Attitude Matters :

9.1 Understand the importance of positive attitude and the consequences of negative attitude.

1.2 Demonstrate positive attitude in dealing with work-related issues and in personal life.

2. Adaptability....*makes life easy* :

10.1 Understand the significance of adaptability.

2.2 Show adaptability whenever needed, both at place of work and on personal front.

3. Goal Setting ... *life without a Goal is a rudderless boat!*

3.2 Understand the SMART features of goal-setting.

3.3 State one's short-term and long-term goals and spell out plans to achieve them.

4. Motivation ... *triggers success!*

4.2 Comprehend the need for motivation in order to achieve success in life.

4.3 State how one is motivated in life.

4.4 Show the impact of motivation on one's life

5. Time Management... *the need of the Hour!*

5.2 Understand the value of time management and prioritizing in life

5.3 Demonstrate the effect of time management on one's professional work.

6. Critical Thinking ... *logic is the key!*

6.1 Distinguish between facts and assumptions

6.2 Use logical thinking in dealing with professional matters

7. Creativity ... *the essential you!*

7.2 Understand the importance of thinking out of the box in dealing with critical issues

7.3 Solve problems using creativity / imagination

8. Problem Solving ... *there is always a way out!*

8.2 Understand the need for and importance of problem solving.

8.3 Use logic or creativity to solve a problem at workplace or home.

9. Team Work... *together we are better!*

9.1 Understand the need for team skills / team building

9.2 Demonstrate one's skills as a team player

10. Leadership... *the meaning of a leading!*

10.1 Understand the need for team skills / team building

10.2 Demonstrate one's skills as a team player

11. Stress Management... *live life to the full!*

11.1 Understand what causes stress and how to cope with stress at workplace.

11.2 Demonstrate how stress can be overcome in a healthy way.

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-509	EDITING Lab	3	45	40	60

GUIDELINES:

- All the exercises provided in the list of practicals should be completed and submitted during the semester examination.
- In order to develop skill in mastering creativity, every student should be made to practice thoroughly.
- The external examiners are requested to ensure that a single practical oriented question should not be given to more than three students while admitting a batch of 30 students during Board Examination.

Laboratory requirements:

S.No	Item	Configuration	Quantity
1	Computer	Processor :: 2.66GHZ Core 2 Quad (or above)	For batch of 5 to 10 students at
		8GB DDR3 RAM	

		1TB HDD SATA	a time
		Monitors – 17"	
		Graphic Accelerator Cards 2 GB RAM, GPU Support	
2	Audio Dubbing Acoustic Studio	HDV - VIDEO CAMERA -1No Stereo Mic- 1No Sound Mixer-1No Amplifier-1No Speakers-1Pair/1 set of home theatre Stereo Head Phones-1set/student	
3	OperatingSys	Windows-XP(64-Bit)- (or above)	
5	Adobe Master Collection CS6	a) PHOTOSHOP b) Premier c) Sony Soundforge	

S No	Chapter/ Unit Title	No. of Periods	COs Mapped
1.	Audio capturing	9	CO1,CO5
2.	Audio Editing	9	CO1,CO3
3.	Video Capturing	9	CO2,CO4
4.	Video Editing	9	CO1,CO2
5.	Video Production (Post Production,Pre production, production)	9	CO5
	Total	45	

COURSE OBJECTIVES	<ol style="list-style-type: none"> 1. To develop process of making movies. 2. To practice basic storyboarding to prepare for a movie using editing software 3. To practice the categories in compositing process 4. To apply editing techniques in various stages of production
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CO No		COURSE OUTCOMES
CO 1	AG-509.1	Practice on the latest techniques in editing
CO 2	AG-509.2	Develop the method to visualize and create their own video logs and short-films.
CO 3	AG-509.3	Apply the concepts of Non-Linear editing
CO5	AG-509.4	Apply the basics of camera technology, sound, microphones, shooting techniques in editing process
CO5	AG-509.5	Apply editing techniques at Pre-production, Production and Post-Production

CO-PO/PSO MATRIX

CO NO.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
AG-509.1	2	1	1	3	3	2	3	3	3	2
AG-509.2		1	3	3	2	2	3	2	3	2
AG-509.3	1						2	3	2	1
AG-509.4		1				2	3	3	3	2
AG-509.5		1	2	2	2	3	2	3	3	3
Average	1.5	1	2	2.2	2.5	2.2	2.8	2.8	2.8	2

3=strongly mapped, 2=moderately mapped, 1=slightly mapped

LEARNING OUTCOMES:

1. Record audio for 10 min edit it for 5 min.
 2. Develop concept for audio recording and mix it with appropriate effects.
 3. Experiment on audio mixing using some effects.
 4. Remove vocals from a song using audio editing software.
5. Convert the raw video file & edit the video sequence for 5min
 6. Create the title for the movie IN 2 min with the given worddocument
 7. Edit the given HD video file and make the final out put in vob (DVD)format
 8. Edit the 3D rendering sequence &make the video file as demoreel
 9. Make the single video file of the interview taken in multicameras
 10. Edit the short film for 5 min video sequence in given 20 min video sequence
 11. Make the teaser(1min) for the givenmovie
 12. Edit the given video with cine quality video effects with warm colortone.

The competencies and key competencies to be achieved by the student

S.No.	Name of the experiment	Objectives	Key Competencies
1	Record audio for 10 min edit it for 5 min	Identify various tools for recording audio and editing the audio.	Identify the options for audio recording Edit audio for 5mnts
2	Develop concept for audio recording and mix it with appropriate effects.	Identify mixing tools	Identify tools for audio mixing Apply suitable effects
3	Experiment on audio mixing using some effects.	Identify the tools to set some audio effects	Identify how we can change the audio by setting some effects.
4	Remove vocals from a song using audio editing software.	Practice in separating various elements in audio.	Identify the tools in separation of elements from audio.
5	Convert the raw video file & edit the video sequence for 5min	Identify the tools to edit video	Identify various options used for video editing
6	Create the title for the movie IN 2 min with the given word document	Demonstrate title editing	Identify various tools to edit titles of a video
7	Edit the given HD video file and make the final out put in vob (DVD)format	Demonstrate the editing of HD video file and changing format of video.	Identify various tools in HD video editing Save it in vob9DVD) format.
8	Edit the 3D rendering sequence &make the video file as	Demonstrate how 3D rendering can be done on given video and practice making video	Identify various tools in rendering Make demo real

	demo reel	file as reel	
9	Make the single video file of the interview taken in multicameras	Demonstrate how to take video using different cameras	Identify tools to edit video captured from different angles.
10	Edit the short film for 5 min video sequence in given 20 min video sequence	Demonstrate how to edit a short film.	Identify tools for editing a short film.
11	Make the teaser(1min) for the given movie	Demonstrate how to make a teaser from a big video.	Identify tools to make a teaser.
12	Edit the given video with cine quality video effects with warm colortone.	Demonstrate the edit the video to get quality video with various effects.	Identify the tools for increasing the quality of video.

Course code	Course Title	No. of Periods/Weeks	Total No. of periods	Marks for FA	Marks for SA
AG-510	Project	6	90	40	60

Guidelines:

9. Students have to be divided into groups consisting of 3 to 4 members.
10. Each group has to develop a project by applying the knowledge acquired during entire diploma course.
11. They have to approach TV studios, Film Industries, Photo and Video Studios , Multimedia centers , DTP centres, Printing presses to collect the information and the long term Projects related to Photography, Animation, Film making ,Print Media and Visual media.
12. They have to be in a position to develop short films , cartoon movies , TV Shows by applying

Pre Shooting , Production Design , Shooting , Post Production , Rigging , Rendering, Lighting, Shading , Editing, Compositing techniques wherever necessary.

13. They have to Produce the Project report at the end of the project.
14. They should conduct minimum three seminars/Workshops to explain the progressive development of their project with co project members and the staff.
15. Some of the examples of the projects may be:
 - a. Create a short film on farming.
 - b. Short film on Education.
 - c. Short film on Cartoon characters.
 - d. Short film on Political roles.
 - e. Short film on Fishing.
 - f. Short film on Airport activities.
 - g. Short film on Cooking.
 - h. Short film on Sports and Games.
 - i. Short film on Social and Ethical responsibilities.
 - j. Short film on Cardiac operation in Hospital.
 - k. Short film on Moon , Sun and other Planets...etc.

In producing all the short films the student should apply all activities mentioned in the Point No. 4 and make them available on social media websites like YouTube, Facebook, Twitter, Instagram and your Institute website.

VI SEMESTER

DIPLOMA IN 3D ANIMATION AND GRAPHIC S ENGINEERING SCHEME OF INSTRUCTIONS AND EXAMINATION

CURRICULUM-2020

(VI Semester)

AG-601 Industrial Training

Sl.No.	Subject	Duration	Scheme of evaluation		
			Item	Nature	Max. Marks
1	Industrial Training	6 months	1.First Assessment at Industry (After 12 Weeks)	Assessment of learning outcomes by both the faculty and training mentor of the industry	120
			2.Second Assessment at the Industry (After 20 weeks))	Assessment of learning outcomes by both the faculty and	120

				training mentor of the industry	
			Final Summative assessment at institution level	Training Report	20
				Demonstration of any one of the skills listed in learning outcomes	30
				Viva Voce	10
TOTAL MARKS					300

The industrial training shall carry **300** marks and pass marks are **50%**.A candidate failing to secure the minimum marks should complete it at his own expenses.

During Industrial training the candidate shall put in a minimum of **90%**attendance at the TV Studios/Fil Studios/Animation Theatres/or any related Multimedia and graphics industries.

Weightage of marks for Assessment of Learning Outcomes during first and second assessment

Sl.No	Learning Outcome	Max Marks Allotted For first assessment	Max Marks Allotted For second assessment
1	Apply knowledge and skill already learnt in the institution.	50	10
2	Acquire the required skills of software development processes, performing Animation and graphics development, editing, pre-shoot, production design, shooting, post shooting activities. Editing , mixing , Uploading , distributing and maintaining the final products produced	70	30
3	Involve in product design, development, quality testing and production by exhibiting the strength, teamwork spirit and self-confidence	-	40
4	Prepare product document, Uploading and	-	40

	importing , distributing product to customers upgrading the product if necessary.		
	Total	120	120

GUIDELINES FOR INDUSTRIAL TRAINING OF DIPLOMA IN 3D ANIMATION AND GRAPHIC S ENGINEERING PROGRAMME

- Duration of the training: 6 months.
- Eligibility: The As per SBTET norms
- Training Area: Students can be trained in planning, executing Animation and Graphics works.
- The Industrial Training shall carry 300 marks and pass marks is 50% in assessment at industry (first and second assessment put together) and also 50% in final summative assessment at institution level.
- Formative Assessment at Industry level shall be carried out by the representative of the industry where the student is undergoing training and the staff member from the concerned section in the institution.
- If the student fails to secure 50% marks in industrial assessments put together, the student should reappear for 6 months industrial training at his own expenses.
- If the student fails to secure 50% marks in final summative assessment at institution level, the student should reappear for final summative assessment, in the subsequent board examination.
- Final Summative assessment at institution level is done by the Head of Section, external examiner and the faculty member who assessed the students during Industrial Training.
- During Industrial Training the candidate shall put in a minimum of 90% attendance.
- If the student fails to secure 90% attendance during industrial training, the student should reappear for 6 months industrial training at his own expenses.

