

II B. Tech I Semester Supplementary Examinations, May/June - 2017
BUILDING MATERIALS AND CONSTRUCTION
(Civil Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
3. Answer any **THREE** Questions from **Part-B**

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**PART -A**

1. a) List out the characteristics of a good tile. (4M)
- b) Explain decay of timber. (4M)
- c) What are the various uses of lime. (3M)
- d) What is a vault? Explain with sketches. (4M)
- e) Indicate the type of paints used for old wood work and new iron work. (4M)
- f) Prepare a list of various tests for concrete. (3M)

**PART -B**

2. a) Discuss the three important types of rocks and their formation. (8M)
- b) Explain the constituents of lime stone. (8M)
3. a) Describe Ashlar stone masonry and state its use in construction of structures. (8M)
- b) Draw the cross section of a tree and explain the structure of timber. (8M)
4. a) Discuss about alternative materials for wood. (10M)
- b) Explain bulking of sand. (6M)
5. a) Explain the following items in case of staircases (i) Balustrade (ii) Handrail (iii) soffit and (iv) pitch (8M)
- b) Explain coupled roof with sketch. (8M)
6. a) Explain pointing and plastering (8M)
- b) Describe the various components of a building. (8M)
7. Write short notes on (16M)
  - (a) Properties of good building stone.
  - (b) Consistency and workability
  - (c) Tar and bitumen as building material
  - (d) Sieve analysis



**II B. Tech I Semester Supplementary Examinations, May/June - 2017**

**ELECTRICAL MACHIENS-I**

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

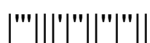
- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
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**PART -A**

1. a) Distinguish the differences between lap and Wave windings (4M)
- b) Distinguish between armature winding and field winding (4M)
- c) Explain the concept of reactance voltage in DC Machine (4M)
- d) Define the Distribution factor for a DC Machine (3M)
- e) What is the effect of brush lead in a DC Motor (3M)
- f) What is Hopkinson's test and where is it applied (4M)

**PART -B**

2. a) Why most practical energy conversion devices use magnetic field as the coupling medium between electrical and mechanical systems? (8M)
- b) State the electromagnetic phenomena useful for the electromagnetic energy conversion in rotating electric machines (8M)
3. a) From the construction point of view, enumerate the common essential features of rotating electrical machines (8M)
- b) A separately excited generator, when running at 1000 rpm supplied 200 A at 125 V. What will be the load current when the speed drops to 800 rpm. If field current is unchanged? Given the armature resistance =  $0.04\Omega$  and brush drop = 2V. (8M)
4. a) Explain why the emf generated in the armature of a DC Motor is called 'back emf' (8M)
- b) The armature of a 4 pole lap wound dc machine has core length = 40 cm, diameter = 50 cm, total conductors = 500, speed = 1200 rpm and current = 20 A. For an average flux density of 0.5 T, find the electromagnetic (or gross mechanical) power developed and the internal torque. (8M)
5. a) Explain the different methods of improving commutation in DC machines (8M)
- b) Two shunt generators running in parallel supply a load of 5000A. Each machine has an armature resistance of  $0.03\Omega$  and a field resistance of  $60\Omega$ . The emf's of the two machines are 600 V and 640 V respectively. Calculate the power output of each machine (8M)
6. a) Explain with a neat connection diagram, the working of a Three point starter used for a DC Shunt motor (8M)
- b) A 230 V dc Shunt motor takes 32 A at full load. Find the back emf on full load if the resistances of motor armature and shunt field windings are 0.22 ohms and 120 ohms respectively (8M)
7. Write short notes on the following: i) Output equation of DC Machine with respect to design concept (16M)  
 ii) Retardation test



**II B. Tech I Semester Supplementary Examinations, May/June - 2017**  
**ENVIRONMENTAL STUDIES**  
(Com. to ECE, EIE, ECC)

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PART -A

1. a) Define acid rain, give its effects. (4M)
- b) Give brief note on wasteland reclamation. (4M)
- c) Describe the importance of biodiversity and its conservation. (4M)
- d) Explain nuclear hazards. (4M)
- e) List out the problems of resettlement and rehabilitation of people. (3M)
- f) What is EIA? (3M)

PART -B

2. a) Explain the multidisciplinary nature of environmental studies. (8M)
- b) Write abiotic, biotic components of the environment and ecological pyramids with a neat sketch. (8M)
3. a) Write commercial and ecological uses of forest resources. (8M)
- b) What is the role of an individual in conservation of natural resources. (8M)
4. a) India is a mega-diversity nation. Explain (8M)
- b) What are threats to biodiversity? (8M)
5. a) Write the causes and effects of urban solid waste. How “3R” strategy is useful for the management of solid waste? (8M)
- b) Define water pollution and explain causes, effects and control measures of air pollution (8M)
6. a) Describe wildlife protection act in detail. (8M)
- b) Give brief note on environmental ethics; issues and possible solutions. (8M)
7. a) Explain Objectives and Scope of Environmental Audit. (8M)
- b) Describe evolution of EIA in India. (8M)



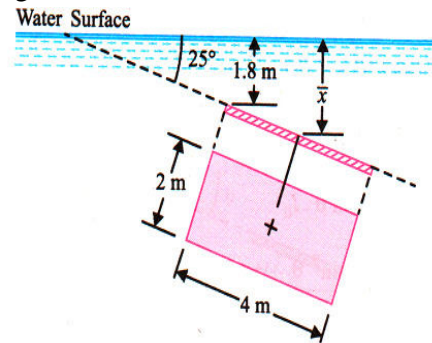
II B. Tech I Semester Supplementary Examinations, May/June - 2017
FLUID MECHANICS
 (Civil Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
 All Questions carry **Equal** Marks

1. a) Define viscosity. Also explain its variation with temperature for liquids and gases.
- b) A differential manometer connected at the two points A and B at the same level in a pipe containing an oil of specific gravity 0.8 shows a difference in mercury levels as 100 mm. Determine the difference in pressures at the two points.
2. a) A rectangular plate 2m wide and 4m deep is immersed in water in such a way that its plane makes an angle of 25° with the water surface as shown in the figure.



Determine the total pressure on one side of the plate and the position of the centre of pressure.

- b) Define total pressure and centre of pressure. Also derive expressions for the same for a case of vertically immersed surface.
3. a) Define stream line, path line, streak line and stream tube.
- b) The stream function for a two-dimensional flow is given by $\Psi=2xy$, calculate the velocity at the point P(4,5). Find the velocity potential function .
4. a) A 45° reducing bend is connected in a pipe line the diameters at the inlet and outlet of the bend being 600 mm and 300 mm respectively. Find the force exerted by water on the bend if the intensity of pressure at inlet to bend is 8.829N/cm^2 and rate of flow of water is 600lps.
- b) List out the assumptions in Bernoulli's equation.



5. a) What are drag and lift. Explain in brief.
- b) A smooth flat plate 1m wide and 1.5m long is rowed lengthwise through still air with a velocity of 10 m/s. Assuming the boundary layer to be fully laminar, estimate its thickness at the trailing edge. Mass density and kinematic viscosity of the air are 1.216kg/m^3 and $0.15 \times 10^{-4}\text{m}^2/\text{s}$ respectively.
6. a) A viscous flow is taking place in a pipe of diameter 100 mm. The maximum velocity is 2m/s. Find the mean velocity and the radius at which this occurs. Also calculate the velocity at 30 mm from the wall of the pipe.
- b) Derive Hagen Poiseulli's equation.
7. A pipe line 300 mm in diameter and 3200 m long is used to pump up 50 kg per second of an oil whose density is 950kg/m^3 and whose kinematic viscosity is 2.1 stokes. The centre of the pipe line at the upper end is 40 m above than at the lower end. The discharge at the upper end is atmospheric. Find the pressure at the lower end draw the hydraulic gradient and the total energy line.
8. a) Water flows at the rate of $0.147\text{m}^3/\text{s}$ through a 150 mm diameter orifice inserted in a 300 mm diameter pipe. If the pressure gauges fitted upstream and downstream of the orifice plate have shown readings of 176.58 kN/m^2 and 88.29 kN/m^2 respectively find c_d of the orifice meter.
- b) Find the viscosity of flow of a liquid of specific gravity 1.59 when it flows through a pipe and shows a reading of 0.1m when a differential gage is attached to a pitot tube. Take the coefficient of the pitot tube as 0.98.



II B. Tech I Semester Supplementary Examinations, May/June - 2017
ELECTRONIC DEVICES AND CIRCUITS
 (Com. to EEE, ECE, EIE, ECC, CSE, IT, BME)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
 All Questions carry **Equal** Marks

1. a) Explain about in magnetic field.
 b) A charged particle having charge thrice that of an electron and mass twice that of an electron is accelerated through a potential difference of 50V before it enters a uniform magnetic field flux density of 0.02 Wb/m^2 at an angle of 25° with field.
 Calculate i). The velocity of the charged particle before entering the field.
 ii). Radius of the helical path
 iii) Time of revolution. (5M+10M)

2. a) In a p-type semiconductor, the Fermi level is 0.25ω above the valence band at room temperature of 300°K . Determine the new position of Fermi level when the temperatures are i) 400°K ii) 600°K
 b) Define Drift and diffusion currents in semiconductor. (8M+7M)

3. a) Explain the principle behind the Varactor diode and list out its applications.
 b) Explain the Construction of a PIN diode and give the applications of PIN diode. (7M+8M)

4. a) Explain about series and shunt voltage regulators.
 b) Derive an expression for the ripple factor in a full wave rectifier using inductor filter. (7M+8M)

5. a) A transistor has $I_B = 100\mu\text{A}$ and $I_C = 2\mu\text{A}$ Find
 i) β of the transistor ii) α of the transistor iii) Emitter current I_E
 iv) if I_B changes by $+25\mu\text{A}$ and I_C changes by $+0.6\text{mA}$. Find the new value of β ?
 b) Explain about Photo Transistor. (5M+10M)

6. a) Explain the construction and working of n-channel JFET?
 b) Briefly describe some applications of JFET. (10M+5M)

7. a) Explain in detail about Stabilization factors.
 b) Explain about Thermistor and Sensistor compensation. (7M+8M)

8. a) Explain about Conversion formulas for the parameters of three transistor configuration
 b) Explain in detail about Measurement of h-parameters (7M+8M)



II B. Tech I Semester Regular/Supplementary Examinations, Oct/Nov - 2016
BUILDING MATERIALS AND CONSTRUCTION
(Civil Engineering)

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**PART -A**

1. a) What are rock forming minerals? (3M)
- b) Explain the cornice and corbel in stone masonry work with sketches (4M)
- c) What are the ingredients of cement? (3M)
- d) List out how stairs are classified? (4M)
- e) Explain water proofing of a building and what materials are used? (4M)
- f) What are the properties of good coarse aggregate? (4M)

**PART -B**

2. a) Describe in detail how lime is manufactured? (8M)
- b) Distinguish between quick, fat and hydraulic lime. (8M)
3. a) What do you understand by natural seasoning of wood? What is its purpose? (8M)
- b) What is the function, use of form work and scaffolding in building construction? (8M)
4. a) Draw neat sketch of (i) king post truss (ii) rcc roof and explain them. (8M)
- b) Explain the precautions in blasting of rocks. (8M)
5. a) Define a lintel and mention the materials which are commonly used in their construction. (8M)
- b) What is a prefabricated roof? Explain their use in building construction. (8M)
6. a) What are the various ingredients of paint? Explain the function of each of them. (8M)
- b) Explain the bond strength of aggregate. (8M)
7. Write detailed notes on fiber reinforced concrete and polymer concrete. (16M)

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PART -A

1. a) Give a list of tools used for stone quarrying. (3M)
- b) Explain seasoning of timber (4M)
- c) What do you understand by hydration of cement? (4M)
- d) Define Intrados and soffit with reference to arches. (4M)
- e) What is the process of preventing moisture in building called? Explain. (3M)
- f) Draw the sketch of Madras terrace roof. (4M)

PART -B

2. a) Describe with neat sketch a brick manufacturing kiln. (10M)
- b) What is a FROG? Explain its importance in bricks. (6M)
3. Discuss the construction of cavity wall and partition wall in buildings and explain why and where they are adopted. (16M)
4. a) Explain crushing test and impact test of concrete. (6M)
- b) Explain the various types of tiles and their use for buildings. (10M)
5. a) Draw the sketch of a RCC lintel and weather shade with all details. (6M)
- b) Explain the classification of Arches Give a complete list of various types of arches. (10M)
6. a) How do you classify various types of paints. Explain in detail each type. (6M)
- b) Discuss about bulk density and porosity of aggregate. (10M)
7. Describe the various types of expansion joints, construction joints and their use in construction. (16M)

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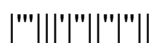
**PART -A**

1. a) List out the characteristics of a good tile. (4M)
- b) Explain decay of timber. (4M)
- c) What are the various uses of lime. (3M)
- d) What is a vault? Explain with sketches. (4M)
- e) Indicate the type of paints used for old wood work and new iron work. (4M)
- f) Prepare a list of various tests for concrete. (3M)

**PART -B**

2. a) Discuss the three important types of rocks and their formation. (8M)
- b) Explain the constituents of lime stone. (8M)
3. a) Describe Ashlar stone masonry and state its use in construction of structures. (8M)
- b) Draw the cross section of a tree and explain the structure of timber. (8M)
4. a) Discuss about alternative materials for wood. (10M)
- b) Explain bulking of sand. (6M)
5. a) Explain the following items in case of staircases (8M)
  - (i) Balustrade           (ii) Handrail
  - (iii) soffit and       (iv) pitch
- b) Explain coupled roof with sketch. (8M)
6. a) Explain pointing and plastering (8M)
- b) Describe the various components of a building. (8M)
7. Write short notes on (16M)
  - (a) Properties of good building stone.
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PART -A

1. a) Why is it important to study the properties of building materials. (4M)
- b) Give the list of tools required for stone masonry. (3M)
- c) What is the chemical composition of Portland cement? (4M)
- d) List out the various types of lintel used in the construction of buildings. (4M)
- e) Define paint, varnish and distemper. (3M)
- f) Draw the sketch of prefabricated roof. (4M)

PART -B

2. a) Discuss the use of non-ferrous materials in building construction. (10M+6M)
- b) Enumerate the principal reasons for decaying timber.
3. a) Explain English bond and Flemish bond with neat sketches. (10M+6M)
- b) Explain various types of cement and their properties
4. a) Explain pitched roof, flat roof and lean to roof. (10M+6M)
- b) What is damp proofing? Discuss the materials used.
5. a) Give a list of various types of floors and explain about any two. (8M+8M)
- b) Describe the materials required for preparing form work and scaffolding.
6. a) Explain white washing and colour washing. (8M+8M)
- b) What are the good qualities of sand for general use in buildings?
7. Write short notes on
 - (a) Geo synthetics
 - (b) Geo textiles
 - (c) Geo grids and
 - (d) Geo membranes (16M)



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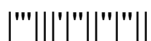
**PART -A**

1. a) What is meant by food chain? (3M)
- b) List the effects of deforestation. (4M)
- c) What is meant by the term Biopiracy? (3M)
- d) Differentiate between smog and photochemical smog. (4M)
- e) Classify the rainwater harvesting methods. (4M)
- f) What are the objectives of Environmental impact assessment? (4M)

**PART -B**

2. a) List the major urban environmental issues in India. (8M)
- b) Explain the functioning of hydrological cycle. (8M)
3. a) Write about Mineral Resources in detail. (8M)
- b) Explain about the use and over utilization of surface and ground water (8M)
4. a) Write about the "India as a mega and diversity nation". (8M)
- b) Explain about conservation of Biodiversity (8M)
5. Explain about causes, effects and control measures of Air pollution? (16M)
6. a) Suggest various methods for the improvement of irrigation efficiency by (8M)  
reducing loss due to evaporation.
- b) Write the issues related to enforcement of environmental legislation (8M)
7. What is significance EIA and various stages of EIA. (16M)

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**PART -A**

1. a) What are ecological pyramids? (4M)
- b) Write a short notes on the mineral resources of India. (4M)
- c) Define the term Hotspot in Biodiversity. (4M)
- d) Define Marine pollution. (3M)
- e) What is acid rain? (4M)
- f) Write the key elements of EIA. (3M)

**PART -B**

2. a) Explain the components of environment and their major interactions. (8M)
- b) Compare the flow of energy and nutrients through an ecosystem. (8M)
3. Write about Food resources, World food problems and effects of modern agriculture. (16M)
4. a) Write about the Hot spots of Biodiversity in detail. (8M)
- b) Explain about the threats of Biodiversity (8M)
5. Explain about causes, effects and control measures of Water Pollution. (16M)
6. Write in detail about the water (Prevention and Control of Pollution) Act, 1974. (16M)
7. What is significance of EMP and various stages of EMP. (16M)

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**PART -A**

1. a) What are pioneer species? (3M)
- b) What is geothermal energy? (4M)
- c) Explain the term Endemic Species with examples. (4M)
- d) Define noise. (3M)
- e) List the major pollution control acts in India. (4M)
- f) What are the possible avenues in which NGOs can contribute to the cause of environmental protection? (4M)

**PART -B**

2. a) Explain the possible impacts of ozone depletion on the ecosystem. (8M)
- b) Explain the components and functions of a forest ecosystem. (8M)
3. Write about renewable and non renewable energy resources. (16M)
4. a) Write about the values of Biodiversity in detail. (8M)
- b) Explain about Endangered and endemic species of India (8M)
5. Explain about causes, effects and control measures of Soil Pollution. (16M)
6. Write in detail about The Air (Prevention and Control of Pollution) Act, 1981. (16M)
7. What is the significance of EIS and various stages of EIS. (16M)

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**PART -A**

1. a) Why decomposers are called 'micro consumers'? (4M)
- b) Define the term "Desertification". (3M)
- c) Define biodiversity. (4M)
- d) Define the Municipal solid waste. (4M)
- e) What are the principal functions of central pollution control board? (4M)
- f) List the different types of impact assessments possible. (3M)

**PART -B**

2. a) Explain the components and functions of a Grass Land ecosystem. (8M)
- b) Explain the role of renewable energy sources in achieving a sustainable energy base. (8M)
3. Write about the land resources, waste land reclamation and man induced land slides (16M)
4. a) Write about the Endangered and Endemic species of India in detail. (8M)
- b) Explain about man-wild life conflicts (8M)
5. Explain about causes, effects and control measures of Noise Pollution. (16M)
6. Write in detail about The Environment (Protection) Act, 1986. (16M)
7. What are significance and various stages Environmental audit and Ecotourism? (16M)

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1. a) A manometer containing mercury is connected to two points 15m apart on a pipeline conveying water. The pipeline is straight and slopes at an angle  $15^\circ$  with the horizontal. The manometer gives a reading of 150 mm. Determine the pressure difference between the two points of the pipeline. Take specific gravity of mercury as 13.6 and that of water as 1.0.  
b) Explain Bourdon's tube pressure gauge.
  
2. a) A rectangular plane surface 2 m wide and 3 m deep lies in water in such a way that its plane makes an angle of  $40^\circ$  with the free surface of water. Determine the total pressure and position of centre of pressure when the upper edge is 1.5 m below the free water surface.  
b) A triangular plate of 1m base and 1.8m altitude is immersed in water. The plane of the plate is inclined at  $30^\circ$  with the free surface of water and the base is parallel to and at a depth of 2m from water surface.
  
3. a) Derive continuity equation for three dimensional flow.  
b) A stream function is given by the expression :  $\Psi = 2x^2 - y^3$ . Find components of the velocity, as well as resultant velocity at a point  $P$
  
4. a) In a  $45^\circ$  bend a rectangular air duct of  $1\text{m}^2$  cross-sectional area is gradually reduced to  $0.5\text{m}^2$  area. Find the magnitude and direction of the force required to hold the duct in position if the velocity of flow at the  $1\text{m}^2$  section is 10 m/s and pressure is  $2.943\text{N/cm}^2$ . Take density of air as  $1.16\text{kg/m}^3$ .  
b) What is Euler's equation?

5. a) Explain the formation of boundary layer along a thin flat plate.  
b) For a linear velocity distribution in the boundary layer on a flat plate show that  $\delta^*/\theta=3$ .
6. a) Oil of viscosity 0.1 Pa.s and specific gravity 0.90 flows through a horizontal pipe of 25 mm diameter. If the pressure drop per metre length of the pipe is 12 k Pa find the rate of flow, the shear stress at the pipe wall, and the Reynolds number of the flow.  
b) Explain Reynolds experiment.
7. The rate of flow of water pumped into a pipe ABC which is 200 m long is 20 lps. The pipe is laid on an upward slope of 1 in 40. The length of the portion AB is 100 m and its diameter is 100 mm. while the length of the portion BC is also 100 m but its diameter is 200mm. The change of diameter at B is sudden. The flow is taking place from A to C where the pressure at A is  $19.62\text{N/cm}^2$  and end C is connected to a tank. Find the pressure at C and draw the Hydraulic gradient line and total energy line. Take  $f=0.008$ .
8. a) A rectangular channel 6m wide carries 2800 lps at a depth of 0.9m. What height of a broad crested rectangular weir must be installed to double the depth. Assume a wier coefficient of 0.86.  
b) Give the purpose of Pitot-tube. Also explain the principle behind it.

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**II B. Tech I Semester Supplementary Examinations, Oct/Nov - 2016****ELECTRONIC DEVICES AND CIRCUITS**

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All Questions carry **Equal** Marks

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1. a) Derive the expressions for acceleration, velocity and displacement of a charged particle placed in an electrical field E.
b) Describe the different types of focusing systems used in CRO.
2. a) Derive continuity equation and explain its importance.
b) Define the following terms:
(i) Mobility (ii) Conductivity (iii) Electron-hole pair
3. a) Explain the construction and working of PIN diode? What are the applications of varactor diode?
b) A silicon diode at a temperature 100°C has a reverse saturation current of $50\mu\text{A}$. At a temperature of 100°C , calculate the dynamic resistance at 0.3V forward bias and 1.5V reverse bias conditions.
4. a) Explain a zener shunt regulator circuit. What are the disadvantages of zener shunt regulator?
b) A full wave rectifier circuit is step down the ac source of 220V in the ratio $10:1$. The circuit is connected to a load of $500\ \Omega/1\text{watt}$ and diode forward resistance is 50Ω . Calculate the maximum and average value of current.
5. a) What are the different breakdowns in a transistor? Explain in detail.
b) When a transistor operates in common-emitter configuration, the base current is $20\mu\text{A}$. The collector current has been changed from $4.5\ \text{mA}$ to $4.7\ \text{mA}$ if the collector-emitter voltage is changed from $8.2\ \text{V}$ to $11.5\ \text{V}$. Determine the output resistance and dc current gains α and β .
6. a) Derive the relationship between transconductance (g_m), drain resistance (r_d) and amplification factor (μ).
b) Describe briefly J-FET and MOSFET and compare and contrast them.
7. a) Explain how thermistor is used for bias compensation.
b) Derive an expression for stability factor S'' for fixed-bias circuit with emitter resistor.
8. a) Obtain CB parameters interms of CE parameters.
b) In common emitter configuration, a transistor has the following parameters $h_{ie}=2.4\ \text{K}\Omega$, $h_{re}=1.5 \times 10^{-4}$, $h_{fe}=55$, $h_{oe}=50 \times 10^{-6}\ \mu\ \text{siemens}$, $R_s=1\ \text{K}\Omega$ and $R_L=2\ \text{K}\Omega$. Determine the voltage gain.

II B. Tech I Semester Supplementary Examinations, Oct/Nov - 2016

MATHEMATICS - III

(Com. to EEE, ECE, EIE, ECC)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry Equal Marks

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1. a) Evaluate i)  $\int_0^1 x^2(1-x)^3 dx$  ii)  $\int_0^1 x^3(1-x^2)^{5/2} dx$  (8M)
- b) Prove that  $4J_n'(x) = J_{n-2}(x) - 2J_n(x) + J_{n+1}(x)$ . (8M)
2. a) Show that i)  $f(z) = e^z$  ii)  $f(z) = e^{\bar{z}}$  in analytic everywhere in the complex plane and find  $f'(z)$  (8M)
- b) If  $f(z) = u + iv$  is analytic and  $v = \frac{2 \sin x \sin y}{\cos 2x + \cosh 2y}$ , find  $u(x, y)$ . (8M)
3. a) Separate  $\tan^{-1}(x + iy)$  into real and imaginary parts. (8M)
- b) Given  $\frac{1}{\rho} = \frac{1}{L\rho i} + c\rho i + \frac{1}{R}$ , where  $L, \rho, R$  are real, express  $\rho$  in the form  $Ae^{i\theta}$  giving the value of  $A$  and  $\theta$  (8M)
4. a) Verify Cauchy's theorem for the function  $f(z) = 3z^2 + iz - 4$  if  $c$  is the square with vertices at  $1 \pm i, -1 \pm i$ . (8M)
- b) Using Cauchy's integral formula, evaluate  $\int_c \frac{z}{(z-1)(z-2)^2} dz$  where (8M)
- $c: |z-2| = \frac{1}{2}$ .



5. a) Find the residue of  $\frac{z^2}{z^4+1}$  at the singular point which lies inside the circle  $|z|=2$ . (8M)
- b) Find the Laurent series expansion of the function  $\frac{z^2-1}{z^2+5z+6}$  about  $z=0$  in region  $2<|z|<3$ . (8M)
6. a) Evaluate  $\int_C \frac{e^z}{(z^2+\pi^2)^2} dz$  where  $C$  is  $|z|=4$ . (8M)
- b) Evaluate  $\int_0^\infty \frac{\cos x}{(1+x^2)^2} dx$ . (8M)
7. a) State and prove Rouché's theorem. (8M)
- b) Find all the zeros of the following functions (8M)
- i)  $\cos z$ ,    ii)  $\sin z$ ,    iii)  $(z^2-1)(z^2-3z+2)$ ,    iv)  $\frac{z^3-1}{z^3+1}$
8. a) Find the bilinear transformation which maps the points  $(z, i, -z)$  in the  $z$ -plane into  $(1, i, -1)$  in  $w$ -plane. (8M)
- b) Find the image of the line  $x=4$  in  $z$ -plane under the transformation  $w = z^2$  (8M)

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**II B. Tech I Semester Supplementary Examinations, May/June - 2016**  
**BUILDING MATERIALS AND CONSTRUCTION**  
(Civil Engineering)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
2. Answer **ALL** the question in **Part-A**  
3. Answer any **THREE** Questions from **Part-B**
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**PART -A**

1. a) State the purpose of dressing of stones in quarry itself.
- b) Distinguish between English bond and Flemish bond.
- c) Explain different ways of classification of timber
- d) What is meant by slaking of lime and state its objects.
- e) State the need of soundness test of cement.
- f) Briefly explain Los Angeles test.

**PART -B**

2. a) Describe the characteristics of good building stones.
- b) Give an account of availability & uses of common building stones.
3. a) State and explain the decay of timber and its precautions.
- b) Write short notes on reinforced plastics.
4. a) Explain in brief the manufacture of lime.
- b) What are the various tests are conducted in the laboratory for the cement.
5. a) What are the advantages and disadvantages of pitched and flat roofs?
- b) Explain briefly the requirement of good staircase. How are treads and risers proportioned for a stair?
6. a) What is the necessity of plastering? What are the specifications of Plastering in wall construction?
- b) What do you understand by the term 'Scaffolding'? With a neat sketch describe in detail the brick layers Scaffolding
7. a) Explain different methods for measurement of moisture content of aggregates in brief.
- b) What is meant by grading of aggregate? Explain Standard grading curve.

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**II B. Tech I Semester Supplementary Examinations, May/June-2016**  
**ELECTRICAL MACHIENS-I**  
 (Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answer **ALL** the question in **Part-A**  
 3. Answer any **THREE** Questions from **Part-B**

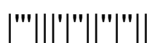
**PART -A**

1. a) Discuss briefly the principle of energy conversion (4M)
- b) Define the terms Front pitch, back Pitch, Commutator Pitch with respect to armature windings connections (4M)
- c) Why is Yoke laminated in DC machines? (3M)
- d) Give advantages and disadvantages of Ward – Leonard Drives (4M)
- e) Explain what would happen if the DC Motor is directly switched on to the supply without any starter (3M)
- f) Distinguish between Cumulative and Differential Compound Motors (4M)

**PART -B**

2. Derive an expression for the torque in a Doubly excited system having salient - pole type of stator as well as rotor. State the assumption made (16M)
3. a) Explain the constructional details of commutator of a DC Machine and give its functions. (8M)
- b) A 15 KW, 250 V, 6 pole lap connected dc generator runs at 1200 rpm. Armature has 500 conductors. For full load armature – ohmic loss of 200 W, find the useful flux per pole. Take 2 V as the brush drop at full load (8M)
4. a) Derive the expression for the emf generated in a DC Machine (8M)
- b) Sketch and explain the load characteristics of the Shunt and Series Generator (8M)
5. a) Explain the process of commutation in Dc machines through the reversal of current in a coil (8M)
- b) Determine the AT/pole for each inter pole of a 4 pole generator with 88 slots each containing 900 ampere - conductors. The inter pole air gap is 0.01m and the flux density in the inter pole air gap is 0.3 T. The effects of iron parts of the circuits and leakage may be neglected. (8M)
6. a) Sketch and explain the speed torque characteristics of DC Shunt, series and cumulative Compound motors. (8M)
- b) A DC Series motor, with unsaturated magnetic circuit and negligible resistance, when running at a certain speed on a given load, takes 50 A at 500 V. If the load torque varies as the cube of the speed, find the resistance to be inserted to reduce the speed by 50 %. (8M)
7. Write short notes on the following: (16M)
  - a) Specific Electric and Magnetic Loadings
  - b) Swinburne's test

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**II B. Tech I Semester Supplementary Examinations, May/June-2016**  
**ENVIRONMENTAL STUDIES**  
(Com. to ECE, EIE, ECC)

Time: 3 hours

Max. Marks: 70

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- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
2. Answer **ALL** the question in **Part-A**  
3. Answer any **THREE** Questions from **Part-B**
- ~~~~~

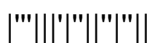
**PART -A**

1. a) Write about ozone layer depletion?
- b) Explain the effects of modern agriculture?
- c) Explain about wildlife conflicts?
- d) Explain the Role of an individual in prevention of pollution?
- e) Write about Forest Conservation Act?
- f) Write about Environmental audit?

**PART -B**

2. What are the different activities that can be taken up to increase public awareness of environmental issues? Explain how they help in better environmental management.
3. a) Explain in detail about Environmental effects of extracting and using mineral resources  
b) Renewable and nonrenewable energy sources
4. a) Describe how you would methodically record the elements and resources in an ecosystem and assess its functioning.  
b) Write about your observations and main conclusions about any ecosystem which you have studied (e.g: forest, sea shore, farmlands, hilly area etc.)
5. Describe the Sources, Effects and Methods of control of the following:  
(a) Noise Pollution.  
(b) Automobile pollution
6. a) What are the major issues associated with rehabilitation?  
b) Explain about Water conservation, rain water harvesting
7. Explain about the identification step in EIA.

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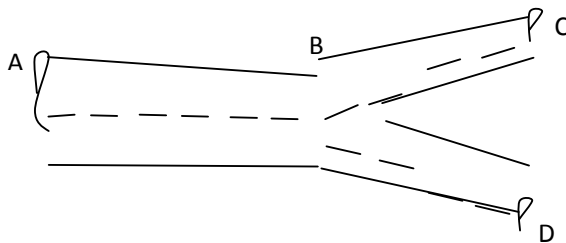
**II B. Tech I Semester Supplementary Examinations, May/June-2016**  
**FLUID MECHANICS**  
 (Civil Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions  
 All Questions carry **Equal** Marks

1. a) What is Pascal's law. Also prove the same.  
 b) Calculate the capillary effect in millimeters in a glass tube of 4mm diameter immersed in water and in mercury. The value of surface tension for water and mercury in contact with air are 0.0735N/m and 0.5100 N/m respectively. The contact angles for water and mercury are  $0^\circ$  and  $130^\circ$  respectively.
  
2. a) A rectangular sluice gate is situated on the vertical wall of a lock. The vertical side of the sluice is 'd' metres in length and depth of centroid of the area is 'p' m below the water surface. Prove that the depth of pressure is equal to  $\left[ P + \frac{d^2}{12p} \right]$   
 b) Find the magnitude and direction of the resultant force due to water acting on a roller gate of cylindrical form of 4.0m diameter when the gate is placed on the dam in such a way that water is just going to spill. Take the length of the gate as 8m.
  
3. a) Explain any four classifications of flows.  
 b) A pipe AB branches into two pipes C and D as shown in the following figure.



The pipe has diameter of 0.45m at A, 0.3m at B, 0.2m at C and 0.15m at D. Find the discharge at A if the velocity of water at A is 2m/s. Also find out the velocities at B and D if velocity at C is 4m/s.



4. a) The discharge of water through a pipe of diameter 40 cm is 400 lps. If the pipe is bend by  $135^\circ$  find the magnitude and direction of the resultant force on the bend. The pressure of flowing water is  $29.43\text{N/cm}^2$ .
- b) What is momentum equation. Give its applications.
5. a) What is meant by separation of boundary layer. How do you control the same.
- b) Obtain the value of  $\delta^*/\delta$  and  $\Theta/\delta$  for velocity distribution  $v/V = 2(y/\delta) - (y/\delta)^3 + (y/\delta)^4$ .
6. A laminar flow is taking place in a pipe of diameter 200 mm. The maximum velocity is 1.5m/s. Find the mean velocity and the radius at which this occurs. Also calculate the velocity at 6 cm from the wall of the pipe.
7. a) Derive Darcy's equation.
- b) Three pipes of lengths 700m, 400m and 300 m and of diameters 500 mm, 400 mm and 300 mm respectively are connected in series. These pipes are to be replaced by a single pipe of length 1600 m. Find the diameter of single pipe.
8. a) Find the discharge over a suppressed rectangular weir 5m long with a head over the crest as 0.40m.
- b) Compare venturimeter and orifice meter.

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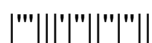
**II B. Tech I Semester Supplementary Examinations, May/June-2016**  
**ELECTRONIC DEVICES AND CIRCUITS**  
 (Com. to EEE, ECE, EIE, ECC, CSE, IT, BME)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions  
 All Questions carry **Equal** Marks  
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1. a) Derive the expression for transit time τ and final velocity V in the case of an electron traversing in uniform electric field E .
 b) Determine the deflection sensitivity in centimeters of deflection per volts of signal for a CRT in which $l = 6$ cm; $L = 50$ cm, $d = 1$ cm and the total accelerating voltage is 5KV.
2. a) State and explain about the following:
 i) Fermi Dirac distribution function. ii) Mass action law.
 b) Find the current density of a silicon bar when it is biased by an electric field of 6 V/cm. The mobility of electrons and holes are $1300 \text{ cm}^2/\text{V-s}$ and $500 \text{ cm}^2/\text{V-s}$ respectively. The silicon bar is doped by acceptor concentration of $4 \times 10^{14} \text{ cm}^{-3}$ and silicon bar intrinsic value is $1.5 \times 10^{10} \text{ cm}^{-3}$.
3. a) Explain the operation of a PN-junction diode. How does a barrier voltage appear across a PN-junction.
 b) The current flow through a PN-junction germanium diode is 50 mA for a forward biased voltage of 0.5V at 300K. Calculate the static and dynamic resistance of the diode.
4. a) Draw and explain the operation of Bridge rectifier.
 b) Define filter. Why are filters used in a dc power supply?
5. a) Explain the various current components in a transistor.
 b) What is meant by "early effect"?
 c) Define "punch through" in early effect.
6. a) Explain how UJT acts as a relaxation oscillator with a circuit diagram.
 b) For an N channel JFET, $I_{DSS} = 8.7 \text{ mA}$, $V_P = -3\text{V}$, $V_{GS} = -1\text{V}$. Find the values of
 (i) I_D (ii) g_{mo} .
7. a) What is meant by stabilization? Explain the different types of stabilization techniques.
 b) What are the differences between self-bias and fixed-bias circuit?
8. a) Obtain CC parameters interms of CE parameters.
 b) In common emitter configuration, a transistor has the following parameters $h_{ie} = 2.4 \text{ K}\Omega$, $h_{re} = 1.5 \times 10^{-4}$, $h_{fe} = 55$, $h_{oe} = 50 \times 10^{-6} \mu \text{ siemens}$, $R_s = 1 \text{ K}\Omega$ and $R_L = 2 \text{ K}\Omega$. Determine the output impedance.



II B. Tech I Semester Supplementary Examinations, May/June-2016

MATHEMATICS - III

(Com. to EEE, ECE, EIE, ECC)

Time: 3 hours

Max. Marks: 80

Answer any FIVE Questions
All Questions carry Equal Marks

- ~~~~~
1. a) show that $\Gamma(n) = \int_0^1 \left(\log \frac{1}{x}\right)^{n-1} dx, n > 0$
 - b) Prove that $\int_{-1}^1 x P_n(x) P_{n-1}(x) dx = \frac{2n}{4n^2 - 1}$

 2. a) Show that $\left(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}\right) \log|f'(z)| = 0$, where $f(z)$ is an analytic function.
 - b) Show that the function $u = e^{-2xy} \sin(x^2 - y^2)$ is harmonic, find the conjugate.

 3. a) Find the general and principal values of (i) $\log(1+i\sqrt{3})$ (ii) $\log(-i)$ (iii) $\log(-1)$
 - b) Determine all values of $(1-i)^{1+i}$

 4. a) Evaluate $\int_0^{1+i} (x^2 - iy) dx$ along the paths (i) $y=x$ (ii) $y=x^2$
 - b) Evaluate $\int_C \frac{\sin \pi z^2 + \cos \pi z^2}{(z-1)(z-2)} dz$, where C is the circle $|z|=3$ using Cauchy's integral formula.

 5. a) Obtain the Taylor's series to represent the function $\frac{z^2 - 1}{(z+2)(z+3)}$, in the region $|z| < 2$.
 - b) Expand $f(z) = \frac{1}{z^2 - 3z + 2}$ in the region (i) $0 < |z-1| < 1$. (ii) $1 < |z| < 2$



6. a) Evaluate $\int_c \frac{\coth z}{z-1} dz$ where C is $|z|=2$.
- b) Evaluate $\int_c \frac{2e^z dz}{z(z-3)}$ where C is $|z|=2$ by Residue theorem.
7. a) State and Prove Rouché's theorem?
- b) Show that one root of the equation $z^4+z+1=0$ lie in the first quadrant
8. a) Find the image of the infinite strip $0 < y < \frac{1}{2}$ under the transformation $w = \frac{1}{z}$
- b) Find the linear fractional transformation that maps the points $z_1=-2, z_2=0, z_3=2$ onto the points $w_1=\infty, w_2=1/4, w_3=3/8$ respectively.



II B. Tech I Semester Regular/Supplementary Examinations, Dec - 2015
BUILDING MATERIALS AND CONSTRUCTION
 (Civil Engineering)

Time: 3 hours

Max. Marks: 70

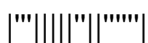
Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **THREE** Questions from **Part-B**

PART -A

1. a) Write different classification of bricks and their uses in brief? (4M)
- b) Short note on teak wood? (3M)
- c) Write Methods of manufacture of lime? (4M)
- d) Write a short note on king post truss? (4M)
- e) What is mean by setting time of cement? (4M)
- f) What is cavity in walls? (3M)

PART -B

2. a) What are the qualities of good building stones? Discuss them? (8M)
- b) Describe the process of blastering? (8M)
3. a) Explain the classification of wood used in buildings in detail? (8M)
- b) Explain about Galvanized Iron, Fiber – Reinforced Plastics (8M)
4. a) Explain any two concrete tests in detail? (8M)
- b) Explain any two laboratory test for cement? (8M)
5. a) Classify various types of lintels and discuss their relative use. (8M)
- b) Write a short note on Arches, Vaults, Stair cases (8M)
6. a) Explain the classification of aggregates? (8M)
- b) Explain about coarse and fine aggregates? (8M)
7. a) Explain in detail about Damp Proofing and water proofing materials? (8M)
- b) Explain about Moisture content of Aggregate (8M)



II B. Tech I Semester Regular/Supplementary Examinations, Dec - 2015
BUILDING MATERIALS AND CONSTRUCTION
 (Civil Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **THREE** Questions from **Part-B**

PART -A

1. a) Write different classification of stones and their uses in brief? (4M)
- b) Write a short note on cavity wall? (3M)
- c) What are the various uses of lime? (4M)
- d) Write a short note on Queen post truss? (4M)
- e) Write different bonds in brick masonry? (4M)
- f) Write the Precautions in blasting? (3M)

PART -B

2. a) Explain about the materials like Gypsum, Glass? (8M)
- b) Discuss briefly about various methods of manufacturing of Tiles? (8M)
3. Explain in detail about
 - a) Cavity wall
 - b) partition wall
 (16M)
4. a) What is Lime and what are the various ingredients of lime? (8M)
- b) Explain the methods in manufacturing of lime explain two methods? (8M)
5. Explain with neat sketches about
 - a) Lean to roof
 - b) Coupled roof
 (16M)
6. a) What are the different types of painting? (8M)
- b) write about vanishes, Form Works (8M)
7. a) Explain the Significance of grades of aggregates? (8M)
- b) Explain different methods of measurement of moisture content of aggregates (8M)



II B. Tech I Semester Regular/Supplementary Examinations, Dec - 2015
BUILDING MATERIALS AND CONSTRUCTION
 (Civil Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **THREE** Questions from **Part-B**

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**PART -A**

1. a) What are the different types of tiles? (4M)
- b) Write short note on defects in timber (3M)
- c) Explain about fineness of Cement? (4M)
- d) Write a short note on Lean to roof? (4M)
- e) Different type of roofs? (4M)
- f) write about Sieve analysis (3M)

**PART -B**

2. a) Explain about the dressing of stones? Draw the sketches of stones neatly? (8M)
- b) Explain the characteristics of good tiles? (8M)
3. a) Explain the difference between English and Flemish bond? (8M)
- b) Explain about Rubble and Ashlar masonry? (8M)
4. a) What are the various ingredients of concrete explain in detail? (8M)
- b) Explain about Setting and Fineness of cement (8M)
5. a) Explain any two types of flooring in detail? (8M)
- b) Draw Neatly King Post Trusses (8M)
6. a) Differentiate between the plastering and pointing (8M)
- b) Explain about distemping, color washing and painting. (8M)
7. a) Explain about the Moisture content of aggregates? (8M)
- b) Explain about the bulking of sand? (8M)



**II B. Tech I Semester Regular/Supplementary Examinations, Dec - 2015**  
**BUILDING MATERIALS AND CONSTRUCTION**  
(Civil Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
2. Answer **ALL** the question in **Part-A**  
3. Answer any **THREE** Questions from **Part-B**

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PART -A

1. a) What are the different types of bricks? (4M)
- b) What are the purposes of partition walls? (3M)
- c) What are the tests in cement? (4M)
- d) Write a short note on Coupled roof? (4M)
- e) What is water proofing? (4M)
- f) Draw coupled roof? (3M)

PART -B

2. a) Explain in detail manufacturing methods of Tiles? (8M)
- b) Explain briefly about manufacturing of bricks. (8M)
3. a) Explain the defects in timber? (8M)
- b) Explain the classification of various types of woods used in buildings? (8M)
4. a) Write short notes on : (8M)
 - i) Hydration of cement
 - ii) Tests in concrete
- b) Explain the chemical composition of cement? (8M)
5. a) What are the different types of roofs explain any two? (8M)
- b) Explain about form work and scaffoldings? (8M)
6. a) Explain the different types of painting? (8M)
- b) Write shorts notes on the following : (8M)
 - i) Plastering
 - ii) White Washing
 - iii) Distempering
7. a) Explain about the (8M)
 - i) Bulking of sand
 - ii) Specific gravity of sand
- b) Explain about Bond and Strength of aggregate (8M)



II B. Tech I Semester Regular/Supplementary Examinations, Dec - 2015**ELECTRICAL MACHIENS-I**

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

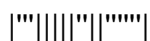
- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **THREE** Questions from **Part-B**

PART -A

1. a) Explain about co-energy. (3M)
- b) Define the simplex lap winding and wave winding. (3M)
- c) A 1500 kw, 600V, 16-pole separately excited DC generator runs at 200 RPM. It has 2,500 lap connected conductors and full – load copper losses are 25 KW. Calculate the useful flux per pole. (4M)
- d) Draw the different characteristics of shunt motor and explain them. (4M)
- e) A 220 V DC shunt motor at No-load takes a current of 2.5 A. the resistance of the armature and shunt field are 0.8W and 200W respectively. Estimate the efficiency of the motor when the input current is 32 A. (4M)
- f) Derive the output equation of DC machine. (4M)

PART -B

2. a) Explain the energy flow in electromechanical systems with energy flow diagrams. (8M)
- b) Derive an expression for co-energy density of an electromechanical energy conversion device. (8M)
3. a) Develop the winding table, winding diagram, sequence diagram and then fix up the brushes for a DC machine with 4 – pole, 24 slot single layer Lap winding. (8M)
- b) A 4-pole generator has wave wound armature with 722 conductors, and it delivers 100A on full load. If the brush lead is 8 degrees calculate the armature demagnetizing and cross-magnetizing ampere turns per pole. (8M)
4. a) Draw the OCC characteristics of DC shunt generator and explain how to find critical resistance of DC Generators. (8M)
- b) Draw the internal and external characteristics of different types of DC generators and explain them. (8M)
5. a) Draw different characteristics of shunt, series and compound motors. (8M)
- b) What is the necessity of starter and explain three point starter. (8M)
6. In a Hopkinson's test on a pair of 500 V, 100 kW shunt generator. The following data was obtained: Auxiliary supply 30 A at 500 V; Generator output current 200 A; Field current 3.5 A and 1.8 A; $r_a = 0.075 \Omega$ for each machine; voltage drop at brushes = 2 V/machine; calculate the efficiency of the machine as a generator. (16M)
7. Calculate the armature diameter and core length for a 7.5kW, 4pole, 1000rpm, and 220V shunt motor. Assume: Full load efficiency = 0.83, field current is 2.5% of rated current. The maximum efficiency occurs at full load. (16M)



II B. Tech I Semester Regular/Supplementary Examinations, Dec - 2015**ELECTRICAL MACHIENS-I**

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

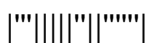
- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **THREE** Questions from **Part-B**
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PART -A

1. a) Mention the advantages of analyzing energy conversion devices by field – energy concept. (3M)
- b) Explain commutation with respect to DC generators and write the function of commutator. (3M)
- c) Compare separately excited DC generator with self excited DC generator. (4M)
- d) Draw the different characteristics of shunt motor and explain them. (4M)
- e) Write the advantages and disadvantages of hopkinson's test. (4M)
- f) Write different factors to consider for choice of number of poles in DC Machine. (4M)

PART -B

2. a) i) Explain the concept of rotating magnetic field.
 ii) Derive the torque equation in round rotor machines. (8M)
- b) Two parallel plates of each of area 2m^2 are separated by a distance "g". The electric field intensity between plates is 5×10^6 V/m, a value equal to break down strength of the air. Find the force between two plates using both energy and co-energy methods. (8M)
3. a) Explain armature reaction in a DC generator and what the methods to reduce its effects are. (8M)
- b) A 6 pole DC armature with 16 slots having two coil sides/slot and single turn coils. Calculate the winding pitches then develop the winding table, winding diagram and then fix up the brushes for a wave winding. (8M)



4. a) The open-circuit characteristics of a separately excited D.C. generator driven at 1000 r.p.m. is as follows:

Field Current	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6
E.M.F. volts	30.0	55.0	75.0	90.0	100.0	110.0	115.0	120.0

If the machine is connected as a shunt generator and driven at 1000 r.p.m. and has a field resistance of 100 ohm, find i) open circuit voltage and exciting current ii) the critical resistance and iii) resistance to induce 115 volts on open circuit. (8M)

- b) Explain the different methods of excitation and characteristics of DC generators with suitable diagrams. (8M)
5. a) Explain principle of operation of DC motor and write the significance of back EMF in DC motors. (8M)
- b) Explain different types of losses occurred in DC motors. (8M)
6. a) Explain field's test on DC series motors. (8M)
- b) In a retardation test on a separately motor, the induced emf in the armature falls from 220V to 190V in 30 seconds on disconnecting the armature from the supply. The same fall takes place in 20 seconds if, immediately after disconnection, armature is connected to a resistance which takes 10A (average) during this fall, find the stray losses of motor. (8M)
7. Calculate the armature diameter and core length for a 7.5 kW, 4 pole, 1000 rpm, and 220V shunt motor. Assume: Full load efficiency = 0.83, field current is 2.5% of rated current. The maximum efficiency occurs at full load. (16M)

II B. Tech I Semester Regular/Supplementary Examinations, Dec - 2015**ELECTRICAL MACHIENS-I**

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
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 3. Answer any **THREE** Questions from **Part-B**

PART -A

1. a) Predominant energy storage does not occur in the air – gap of an electromechanical energy conversion device. Is this statement correct? Give reason in support of your answer. (3M)
- b) What is the necessity of laminating the armature core of a DC generator and explain different types of windings of armature. (3M)
- c) Draw internal and external characteristics of shunt, series and compound generator. (4M)
- d) Draw the characteristics of series motor. (4M)
- e) Explain regenerative braking. (4M)
- f) Derive the output equation of DC Machine. (4M)

PART -B

2. a) Briefly explain the various phenomena useful for electromechanical energy conversion in rotating machines. (8M)
- b) Derive an expression for co-energy density of an electromechanical energy conversion device. (8M)
3. a) Explain armature reaction in detail. (8M)
- b) Explain about compensating windings and inter poles. (8M)
4. a) What are the reasons for a shunt generator not to build up voltage. Explain the remedial measures. (8M)
- b) A 100 kW DC generator driven by a belt from an engine runs at 750 rpm and is connected to 230 V dc mains. When the belt breaks, it continues to run as a motor drawing 9kW from the mains. At what speed would it run? Given: Armature resistance = 0.018 Ω and field resistance = 115 Ω . (8M)
5. a) A 440V DC shunt motor is running at 1500rpm and it takes a line current of 30A. The output is 15HP. The load torque varies as the square of speed. Calculate the resistance to be connected in series with the armature for reducing the motor speed to 1300rpm. (8M)
- b) Draw and Explain the operation of 4 – point starter. (8M)
6. a) Explain Field test for series motor. (8M)
- b) Explain swinburn's test on DC machine when the machine act as motor. (8M)
7. For a preliminary design of a 1500kW, 275V, 300rpm, dc shunt generator determine the number of poles, armature diameter and core length, number of slots and number of conductors per slot. Assume: Average flux density over the pole arc as 0.85T, Output coefficient 276, Efficiency 0.91. Slot loading should not exceed 1500A. (16M)

II B. Tech I Semester Regular/Supplementary Examinations, Dec - 2015**ELECTRICAL MACHIENS-I**

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

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 2. Answer **ALL** the question in **Part-A**
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PART -A

1. a) On what factors, the EMF induced in a coil rotating in a magnetic field is depending and derive the expression for torque in DC machines. (3M)
- b) What do you mean by "back emf" in DC Machine and write the significance of back emf. (3M)
- c) Draw internal and external characteristics of shunt, series and compound generator. (4M)
- d) What is a starter? Write significance of starter. (4M)
- e) Explain break test on shunt motor. (4M)
- f) Write different factors to consider for choice of number of poles in DC Machine. (4M)

PART -B

2. a) Draw and explain schematic diagram of flow of energy in the conversion of electrical energy into mechanical term. (8M)
- b) For a linear magnetic circuit, derive the expression for stored energy and Co-energy. (8M)
3. a) Explain lap and wave windings of DC machines. (8M)
- b) Derive the expressions for Ampere turns per pole for demagnetizing and cross magnetizing effect. (8M)
4. a) Explain open circuit characteristics of DC generator and also explain how to find critical field resistance-critical speed of DC generator. (8M)
- b) Draw the internal and external characteristics of different types of DC generators and explain them. (8M)
5. a) Draw different characteristics of shunt, series and compound motors. (8M)
- b) With a neat sketch explain the construction and working of a 3 point starter. What are the limitations of 3 point starter. (8M)
6. a) Explain Break test on DC shunt motor by drawing circuit diagram. (8M)
- b) Explain hopkinson's test on DC machines. (8M)
7. For a preliminary design of a 50hp, 230V, 1400 rpm dc motor, calculate the armature diameter and core length, number of poles and peripheral speed. Assume specific magnetic loading 0.5T, specific electric loading 25000 ampere-conductors per meter, efficiency 0.9. (16M)



II B. Tech I Semester Regular/Supplementary Examinations, Dec - 2015
ENVIRONMENTAL STUDIES
(Com. to ECE, EIE, ECC)

Time: 3 hours

Max. Marks: 70

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2. Answer **ALL** the question in **Part-A**
3. Answer any **THREE** Questions from **Part-B**

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**PART -A**

1. a) Give short note on ecological pyramids (4M)
- b) Write about Wasteland reclamation (4M)
- c) Define biodiversity and explain its importance. (4M)
- d) What are the preventive measures for air pollution (3M)
- e) What is the effect of Rehabilitation of the people? (4M)
- f) Explain about EIA (3M)

**PART -B**

2. a) Write about population growth and explosion (8M)
- b) Define environmental studies and give the importance of environmental studies (8M)
3. a) Write notes on environmental effects of extracting and using mineral resources. (8M)
- b) Write about uses and over exploitation of surface and ground water. (8M)
4. a) Explain endangered and endemic species of India with examples. (8M)
- b) Give brief note on biodiversity at national and local levels. (8M)
5. a) What are the major causes of Nuclear hazards and accidents? (8M)
- b) Discuss the ways to minimize radiation exposure in case of nuclear accidents. (8M)
6. a) Explain in detail urban problems related to energy. (8M)
- b) Discuss salient features of Water Act and Wildlife Protection Act. (8M)
7. a) Give brief note on Environmental Management Plan (8M)
- b) Explain about Ecotourism and its importance. (8M)



**II B. Tech I Semester Regular/Supplementary Examinations, Dec - 2015**  
**ENVIRONMENTAL STUDIES**  
 (Com. to ECE, EIE, ECC)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answer **ALL** the question in **Part-A**  
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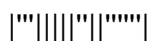
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PART -A

1. a) Explain ecological succession (4M)
- b) What are the effects of dams on forest and tribal people? (4M)
- c) Give brief note on habitat loss. (4M)
- d) What are the control measures for water pollution (4M)
- e) Explain environmental ethics. (3M)
- f) Expand EMP. (3M)

PART -B

2. a) What is the role of information technology in human health. (8M)
- b) What is a food chain and food web? Explain ecological pyramid? (8M)
3. a) What are the effects of over exploitation of ground water resources? (8M)
- b) What are the advantages of modern agriculture over traditional farming? (8M)
4. a) Define value of biodiversity; discuss consumptive use and productive use. (8M)
- b) What are the hotspots of biodiversity, why it is important to preserve these areas? (8M)
5. a) Define air pollution and classify major sources of air pollution. (8M)
- b) List the major physiological effects of air pollution on plants and human beings. (8M)
6. a) Write brief note on Environmental Protection Act and Air Act. (8M)
- b) What are the measures to be taken for conservation of water resources? (8M)
7. a) Environmental Impact Assessment and its significance in various stages. (8M)
- b) Explain Environmental audit and its importance. (8M)



II B. Tech I Semester Regular/Supplementary Examinations, Dec - 2015
ENVIRONMENTAL STUDIES
 (Com. to ECE, EIE, ECC)

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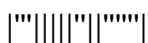
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**PART -A**

1. a) Give brief note on ozone layer depletion (4M)
- b) Role of individual in conservation of natural resources. (4M)
- c) Explain hot spots of biodiversity. (4M)
- d) What are the main source of solid waste (4M)
- e) List the major pollution control acts in India. (3M)
- f) Define environmental management (3M)

**PART -B**

2. a) Define environmental studies. Explain the scope and importance of environmental studies (8M)
- b) What is the concept of an ecosystem? Write its structure and functions of an ecosystem. (8M)
3. a) Explain the problems created by construction of dams for irrigation (8M)
- b) Explain growing energy needs and how can overcome these with alternate energy resources (8M)
4. a) Explain conservation techniques taken for biodiversity. (8M)
- b) Explain in detail threats to biodiversity with suitable examples. (8M)
5. a) Discuss in detail the sources, effects and methods of control of noise pollution. (8M)
- b) Write about soil pollution and explain the impacts of modern agriculture on soil. (8M)
6. a) Discuss the problems associated with resettlement and rehabilitation of people. (8M)
- b) What are the major issues involved in enforcement of environmental legislation. (8M)
7. a) Give brief note on preparation of EMP and EIS (8M)
- b) Discuss about ecotourism (8M)



**II B. Tech I Semester Regular/Supplementary Examinations, Dec - 2015**  
**ENVIRONMENTAL STUDIES**  
 (Com. to ECE, EIE, ECC)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answer **ALL** the question in **Part-A**  
 3. Answer any **THREE** Questions from **Part-B**

**PART-A**

1. a) Define food chain and food web with one example (4M)
- b) Give brief note on water logging and salinity (4M)
- c) Explain man-wild life conflicts. (3M)
- d) What are the causes and ill effects of water pollution. (4M)
- e) Define and explain resettlement of the people. (4M)
- f) Explain about EIS (3M)

**PART-B**

2. a) Give brief note on global warming and acid rains and their effects. (8M)
- b) Give the characteristic features of forest ecosystem. (8M)
3. a) Discuss the importance of renewable resources in the view of depleting natural resources (8M)
- b) Give brief note on forest resources, use and over exploitation, deforestation and associated problems. (8M)
4. a) Define biodiversity. Explain about diversity species and ecosystem diversity. (8M)
- b) Explain India as a mega – biodiversity nation. (8M)
5. a) Give brief note on solid waste management. (8M)
- b) What is the role of an individual in prevention of pollution? (8M)
6. a) Write about watershed management leading to water conservation. (8M)
- b) Write the salient points of Forest Conservation Act. (8M)
7. a) Define and explain Environment Management and Environmental Audit. (8M)
- b) Give brief note on Ecotourism and Environmental Impact Statement. (8M)





**II B. Tech I Semester Supplementary Examinations, Dec - 2015****FLUID MECHANICS**

(Civil Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions  
 All Questions carry **Equal** Marks

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1. a) Explain micro manometers.
 b) Define any four physical properties of fluids.

2. a) A rectangular plate 2mX3m is immersed in water in such a way that its greatest and least depths are 6m and 4m respectively from the water surface. Calculate the total pressure on the plate.
 b) Define total pressure and derive the expression for the same for a case of an inclined immersed surface.

3. a) What are stream function and velocity potential functions. For which type of flows they exist. Also give the relations between them.
 b) Water is flowing through a pipe of 100 mm diameter with an average velocity of 10 m/s. Determine the rate of discharge of the water in lps. Also determine the velocity of water at the other end of the pipe if the diameter of the pipe is gradually changed to 200mm.

4. a) A 45⁰ reducing bend is connected in a pipe line the diameters at the inlet and outlet of the bend being 40 cm and 20 cm respectively. Find the force exerted by water on the bend if the intensity of pressure at inlet of bend is 21.58 N/cm². The rate of flow of water is 500lps.
 b) What are Navier-Stokes equations?



5. a) Explain separation of boundary layer.
b) Obtain the value of δ^*/δ and Θ/δ for velocity distribution $v/V = 2(y/\delta) - (y/\delta)^2$.
6. An oil of viscosity 0.1 N.s/m^2 and relative density 0.9 is flowing through a circular pipe of diameter 50 mm and of length 300 m. The rate of flow of fluid through the pipe is 3.5 lps. Find the pressure drop in a length of 300m and also the shear stress at the pipe wall.
7. a) List out various minor losses. Also give the corresponding formulae.
b) An old water supply distribution pipe of 250 mm diameter of a city is to be replaced by two parallel pipes of smaller equal diameter having equal lengths and identical friction factor values. Find out the new diameter required.
8. a) A venture meter having a diameter of 75mm at the throat and 150 mm diameter at the enlarged end is installed in a horizontal pipeline 150 mm in diameter carrying an oil of specific gravity 0.9. The difference of pressure head between the enlarged end and the throat recorded by a U-tube is 175 mm of mercury. Determine the discharge through the pipe. Assume c_d of the meter as 0.97.
b) Why the convergent and divergent sections have different lengths in a venture meter.



II B. Tech I Semester Supplementary Examinations, Dec - 2015
ELECTRONIC DEVICES AND CIRCUITS
 (Com. to EEE, ECE, EIE, ECC, CSE, IT, BME)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions
 All Questions carry **Equal** Marks
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1. a) Derive an expression for magnetic deflection sensitivity of a C.R.O.  
 b) In a CRT, the electrons emitted are accelerated by a potential of 500V. The length of the deflecting plates is  $l = 1.3\text{cm}$ . Distance between the deflecting plates is 0.5cm. The distance between the centre of the deflecting plates and the screen is 20cm. Determine the value of electrostatic deflection sensitivity.
2. a) Write the Fermi-Dirac distribution function and explain Fermi level.  
 b) The intrinsic carrier density at room temperature in Ge is  $2.38 \times 10^{19}/\text{m}^3$ . If the electron and hole mobilities are 0.38 and  $0.19 \text{ m}^2/\text{Vs}$  respectively. Calculate the resistivity.
3. a) What is the operating principle of LED? Why are Si and Ge not used in LED?  
 b) What is breakdown of a diode? What is the difference between avalanche breakdown and zener breakdown of a PN-junction diode?
4. a) Explain the principle of operation of FWR with capacitor filter and derive an expression for its ripple factor.  
 b) Compare the performance measure of different filters.
5. a) At  $V_{CE} = 8.6 \text{ V}$ , the change in collector current is 1.2mA for a change in base current of  $20\mu\text{A}$ . Find  $\beta$  of the transistor.  
 b) Draw and explain the V-I characteristics of phototransistor.
6. a) In an N-channel JFET,  $I_{DS}$  is 6 mA and  $V_P = -6\text{V}$ . Find the minimum value of  $V_{DS}$  for pinch-off operation. Determine the value of drain current at  $V_{GS} = -3\text{V}$ .  
 b) Explain the construction and working of MOSFET with a neat diagram.
7. a) Draw the circuit diagram of a self bias circuit and derive expression for S. Why it is widely used?  
 b) Discuss the phenomena of thermal runaway.
8. a) Draw the small signal hybrid model of CE amplifier and derive the expressions for its  $A_i$ ,  $A_v$ ,  $R_i$  and  $R_o$ .  
 b) For any amplifier prove that  $R_i = \frac{h_i}{1 - h_r A_v}$ .

