Code No: RT32012 **R13** SET - 1

III B. Tech II Semester Regular/Supplementary Examinations, April- 2017

GEOTECHNICAL ENGINEERING – II

(Civil Engineering)

Time: 3 hours Max. Marks: 70

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

*****

PART –A

1	a)	How do you decide the number of boreholes to be made in the soil investigation?	[3M]
	b)	Define infinite and finite earth slopes.	[4M]
	c)	Discuss the factors affecting bearing capacity of shallow foundations.	[4M]
	d)	List the causes and effects of settlement.	[4M]
	e)	What are the methods for the installation of piles? Discuss briefly.	[3M]
	f)	Briefly explain the construction procedure of floating caisson.	[4M]

PART –B

2	a)	What are the different corrections to be made to SPT field values?	[4M]
	b)	Discuss about methods of Boring.	[8M]
	c)	Describe split spoon sampler.	[4M]
3	a)	Explain the Culmann's graphical method.	[8M]
	b)	Discuss the uses of stability charts. A cutting of depth 10 m is to made in soil which has c = 30 kN/m^2, γ = 19 kN/m^{3}and ϕ = 0. There is a hard stratum below the original soil surface at a depth of 12 m. Find the safe slope of cutting if the factor of safety is 1.5. For D_f= 1.20; S_n= 0.143 for i = 30^0; S_n= 0.101 for i = 15^0.	[8M]
4	a)	Explain different types of shear failures of soil with neat sketch.	[6M]
	b)	Compute the safe bearing capacity of a continuous footing 1.5 m wide, at a depth of 1.5 m, in a soil with γ = 18 kN/m^3, c = 18 kN/m^2, and φ = 25°. Terzaghi's factors of φ = 25° are Nc = 25, Nq = 12.5, and Nγ = 10. What is the safe load per metre run if the factor of safety is 3?	[10M]
5	a)	Describe the procedure to conduct the plate load test with a sketch and state its limitations.	[10M]
	b)	A 1.8 m square column is founded at a depth of 1.8 m in sand, for which the corrected N-value is 24. The water table is at a depth of 2.7 m. Determine the net allowable bearing pressure for a permissible settlement of 40 mm and a factor of safety of 3 against shear failure.	[6M]

6	a)	List various types of pile foundations. What are the conditions where a pile foundation is more suitable than a shallow foundation?	[6M]
	b)	Explain Indian standard method of conducting a pile load test with a sketch. How do you estimate safe load carrying capacity from the results of pile load test?	[10M]
7	a)	Describe the various components of pneumatic caisson with the help of a sketch.	[8M]
	b)	Discuss the various kinds of forces likely to act on a well foundation.	[8M]

*****

Code No: RT32012 **R13** SET - 2

III B. Tech II Semester Regular/Supplementary Examinations, April- 2017

GEOTECHNICAL ENGINEERING – II

(Civil Engineering)

Time: 3 hours Max. Marks: 70

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

*****

PART –A

1	a)	How do you decide the depth and lateral extent of exploration?	[4M]
	b)	Describe different types of slope failures.	[4M]
	c)	State the factors affecting location of footing.	[3M]
	d)	What are the components of settlement? Distinguish between them?	[3M]
	e)	What is negative skin friction?	[4M]
	f)	What do you understand by grip length? What is its importance in well foundations?	[4M]

PART –B

2	a)	Enumerate the various methods of subsoil exploration. Describe the procedure to conduct the Standard Penetration Test and corrections to be applied	[10M]
	b)	Explain pressure meter test.	[6M]
3	a)	Explain the Rankine's theory for various backfill condition to calculate active and passive state earth pressure.	[10M]
	b)	Discuss the Swedish arc method for the stability analysis of slopes.	[6M]
4	a)	Differentiate the terms (i) Gross pressure and net pressure (ii) Ultimate bearing capacity and net ultimate bearing capacity and (iii) Safe bearing pressure and allowable bearing pressure.	[6M]
	b)	A square footing carries a load of 800kN. The depth of the footing is 1.5m. The properties of the soil are c=0, $\varphi=38^0$, and $\gamma=18.5kN/m^3$. Determine the size of the footing for a factor of safety of 3 against shear failure. What will be the changes in the size of the footing, if the water table rises to ground level? (for $\varphi=38^o$, the Nc=52, Nq=49 and Nγ=64).	[10M]
5	a)	The corrected blow count from SPT in a medium sand, observed at an average depth of 2.5 m was 22 blows/30 cm. Laboratory tests conducted on the sample revealed the following physical properties: $c'= 0$, $\phi' = 30^0$and $\gamma_t = 18.5\ kN/m^3$. The water table was located at 4.5 m from the ground level. It is planned to place a 2 m wide square footing at depth of 2 m. Estimate the allowable gross bearing pressure for the soil if the factor of safety against shear failure is 2.5 and limiting settlement is 25 mm.	[10M]
	b)	What is the significance of permissible settlement? State the permissible settlements for isolated and raft foundations in clays and Sandy Soils.	[6M]

6 a) A pile is driven with a single acting steam hammer of weight 15 kN with a free fall of 900mm. The final set, the average of the last three blows, is 27.5mm. Find the safe load using the Engineering News formula. [4M]

b) What are different types of piles and their functions? Explain with sketches. [12M]

7 a) Briefly explain the procedure adopted in well sinking and bring out the problems that are encountered in open sinking? [8M]

b) Under what circumstances is a Pneumatic Caisson preferred? What are the safety Precautions to be followed in working with a Pneumatic Caisson? [8M]

*****

Code No: RT32012 **R13** SET - 3

III B. Tech II Semester Regular/Supplementary Examinations, April- 2017

GEOTECHNICAL ENGINEERING – II

(Civil Engineering)

Time: 3 hours Max. Marks: 70

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

*****

PART –A

1	a)	List out the various methods of subsoil exploration.	[3M]
	b)	Compare Rankine's theory and Coulomb's theory.	[4M]
	c)	State the circumstances to go for combined footing.	[3M]
	d)	What are allowable settlements of structures?	[4M]
	e)	What are the limitations of the dynamic pile formulae?	[4M]
	f)	Sketch and describe the various components of a well foundation.	[4M]

PART –B

2	a)	Enumerate the types of soil samples and distinguish them.	[4M]
	b)	Write briefly about the dynamic cone penetration test.	[8M]
	c)	State the objectives of soil exploration.	[4M]
3	a)	Explain the Coulomb wedge theory with neat sketches.	[6M]
	b)	Explain the active and passive states of earth pressure acting on a retaining wall.	[6M]
	c)	What is a stability number? What is its utility in the analysis of stability of slopes?	[4M]
4	a)	Differentiate between general shear failure, punching shear failure, punching shear failure and local shear failure.	[6M]
	b)	A strip footing, 1 m wide, rests on the surface of a dry cohesion less soil having φ = 25° and γ = 18 kN/m^3. What is the ultimate bearing capacity? What is the value, if there is complete flooding? Assume Nγ = 10.	[6M]
	c)	Explain Terzaghi's analysis of bearing capacity of soil in general shear failure.	[4M]
5	a)	How would you determine the bearing capacity from plate load tests? What are the limitations of the plate load test?	[10M]
	b)	A rectangular footing (3m×2m) exerts a pressure of 100 kN/m^2 on a cohesive soil (Es=5×104 kN/m^2 and μ= 0.5). Determine the immediate settlement at the centre, assuming i) the footing is flexible and ii) the footing is rigid Take I_f for the flexible footing is 1.36 and I_f for rigid footing is 1.06	[6M]
6	a)	In a 16 pile group, the pile diameter is 50 cm and centre to centre spacing of square group is 1.8 m. If c=40 kN/m^2, determine whether the failure would occur with a pile acting individually or as a group? Neglect the end bearing resistance of the piles. All piles are 11 m long. Take mobilization factor, α for given cohesion is 0.7	[12M]
	b)	How would you estimate the load carrying capacity of a pile in cohesion less soils?	[4M]

|''|'''||''||'''||||

7 a) An open caisson, 20 m deep, is of cylindrical shape, with external and internal diameters of 9 m and 6 m, respectively. If the water level is 2 m below the top of the caisson, determine the minimum thickness of the seal required. Assume σ_c = 2400 kN/m^2 and γ_c = 24 kN/m^3, for concrete. Allowable perimeter shear stress = 650 kN/m^2. [10M]

b) What are the advantage and disadvantages of pneumatic caissons over open caissons? [6M]

*****

Code No: RT32012 **R13** SET - 4

III B. Tech II Semester Regular/Supplementary Examinations, April- 2017
GEOTECHNICAL ENGINEERING – II
(Civil Engineering)

Time: 3 hours Max. Marks: 70

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

PART –A

1 a) What are the different types of samples that can be obtained from soil investigation? Explain briefly. [4M]
b) Discuss the factors influencing the slope stability. [4M]
c) What are the assumptions made in the derivation of Terzaghi's bearing capacity theory? [3M]
d) What are the remedial measures against harmful settlements? [4M]
e) What are the factors consider while selecting the type of pile? [3M]
f) What are the circumstances under which a well foundation is more suited than other types? [4M]

PART –B

2 a) State the points to be considered in preparation of soil investigation report. [6M]
b) Describe the procedure to conduct Static Cone Penetration Test. [6M]
c) What are design features that affect the sample disturbance? [4M]

3 a) What are the different factors of safety used in the stability of slopes? Also describe different types of slope failures. [6M]
b) A retaining wall is 7 m high, with its back face smooth and vertical. It retains sand with its surface horizontal. Using Rankine's theory, determine active earth pressure at the base when the backfill is (a) dry, (b) saturated and (c) submerged, with water table at 2 m below the surface. Take γ_t=18 kN/m^3, γ_{sat}=21 kN/m^3 and $\phi = 30^0$. [10M]

4 a) List the types of foundations and explain how to select the suitable foundation for the given type of structure. [6M]
b) What is a 'raft foundation'? When is it preferred? [4M]
c) (b) Give the approximate Terzaghi's formula you will use for the design of: (i) square footing; (ii) circular footing; and (iii) rectangular footing. [6M]

5 a) The following are the results of a load-settlement test carried out on a 30 cm×30 cm plate inside a square pit at a depth of 1.2 m in sandy soil.Find the size of the square footing to carry a load of 700 kN at the specified settlement of 25 mm [10M]

Load, kN	0.4	1.0	1.5	2.0	2.5	3.0
Settlement, mm	1.5	3.8	5.1	7.4	11.3	14.2

b) What are the types of foundation settlements? How is these determining? [6M]

6 a) What is negative skin friction in piles? Explain the causes of negative skin friction. [6M]

b) A pipe group consisting of 9 piles is arranged in 3 rows with 3 piles in each row. Diameter of each pile is 35 cm and spacing is 1.2 m. Length of pile is 10 m. The piles are driven completely in clayey soil having unconfined compressive strength of $100kN/m^2$. The piles are designed as frictional. Determine the capacity of pile group. Take $\alpha = 0.7$ [10M]

7 a) What are the advantages and disadvantages of a Pneumatic Caisson when compared with other types? [8M]

b) What are the problems that encountered in well sinking? What are the remedial measures to control? [8M]

*****

Code No: RT32012 **R13** SET - 1

III B. Tech II Semester Supplementary Examinations, November/December-2016

GEOTECHNICAL ENGINEERING – II

(Civil Engineering)

Time: 3 hours Maximum Marks: 70

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

*****

PART –A

1	a)	Sketch a split-spoon sampler and explain its parts.	[4M]
	b)	If a uniform surcharge of 120 kN/m^2 is placed on the backfill with $\varphi^1 = 30^0$, find out the increase in pressure.	[3M]
	c)	What are the factors influencing the bearing capacity?	[3M]
	d)	A 2 m wide strip footing rests at a depth of 2 m below the ground surface where water table is at the ground surface. Find the ultimate load which the strip can carry according to Terzaghi's theory when γ_{sat} = 20 kN/m^3 and C = 30 kN/m^2.	[4M]
	e)	Describe the types of pile foundations.	[4M]
	f)	What is tilt and shift in well foundations?	[4M]

PART -B

2	a)	Describe with a neat sketch how will you carry out the wash boring method of soil exploration. What are its merits and demerits?	[8M]
	b)	Compute the area ratio of a sampler with inside diameter 70 mm and thickness 2 mm. Comment.	[8M]
3		A retaining wall is 7 m high, with its back face smooth and vertical. It retains sand with its surface horizontal. Using Rankine's theory, determine active earth pressure at the base when the backfill is (a) dry (b) saturated and (c) submerged, with water table at the surface. Take γ = 18 kN/m^3 and $\varphi = 30^0$, γ_{sat} = 21 kN/m^3.	[16M]
4		A circular plate of diameter 1.05 m was placed on a sand surface of unit weight 16.5 kN/m^3 and loaded to failure. The failure load was found to give a pressure of 1,500 kN/m^2. Determine the value of the bearing capacity factor N . The angle of shearing resistance of the sand measured in a triaxial test was found to be 39°. Compare this value with the theoretical value of N . Use Terzaghi's theory of general shear failure.	[16M]
5	a)	Write brief note on elastic settlements.	[8M]
	b)	Estimate the immediate settlement of a concrete footing 1.5 m x 1.5 m in size founded at a depth of 1 m in silty soil whose modulus of elasticity is 90 kg/cm^2. The footing is expected to transmit a unit pressure of 200 kN/m^2. Assume μ = 0.35, I_f = 0.82 for a rigid footing.	[8M]
6	a)	Explain the basic difference in the bearing capacity computation of shallow and deep foundations.	[8M]
	b)	A 30 cm square pile, 15 m long, is driven in a deposit of medium dense sand (φ = 36°, $N\gamma$ = 40 and Nq = 42). The unit wt. of sand is 15 kN/m^3. What is the allowable load with a factor of safety of 3? Assume lateral earth pressure coefficient = 0.6.	[8M]
7		An open caisson, 19 m deep, has external and internal diameters of 8 m and 6 m, respectively. If the water level is 2 m below the top of the well and the depth of the base below the scour level is 5m, determine the minimum thickness of the seal that will enable complete dewatering the caisson. Take σ_c = 2000 kN/m^2, γ_c = 24 kN/m^3 and allowable perimeter shear of of 650 kN/m^2.	[16M]

*****

|''|'''||''||'''||||

Code No: RT32012 **R13** SET - 1

III B. Tech II Semester Regular Examinations, April - 2016
GEOTECHNICAL ENGINEERING – II
(Civil Engineering)

Time: 3 hours Max. Marks: 70

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

PART –A

1	a)	What are the methods of soil exploration?	[3M]
	b)	Explain finite and infinite slopes.	[4M]
	c)	What are factors affecting Bearing Capacity?	[4M]
	d)	What are the different types of foundation settlements?	[3M]
	e)	How do you determine the group efficiency of piles?	[4M]
	f)	What is grip length with respect to well foundations?	[4M]

PART -B

2	a)	Explain with neat figure area ratio, inside and outside clearances of a cutting edge used for soil exploration borings.	[4M]
	b)	Explain in detail about preparation of soil investigation report including RECORD OF BORING [IS : 1892-1979]	[8M]
	c)	An SPT was conducted in a dense sand deposit at a depth of 20 m, and a value of 48 was observed for N. The density of the sand was 14 kN/m^3. What is the value of N, corrected for overburden pressure?	[4M]
3	a)	Explain Taylor's stability number.	[3M]
	b)	Explain Culmann's graphical method and also it's advantages.	[8M]
	c)	An embankment is inclined at an angle of 35° and its height is 15 m. The angle of shearing resistance is 15° and the cohesion intercept is 200 kN/m^2. The unit weight of soil is 18 kN/m^3. If Taylor's stability number is 0.06, find the factor of safety with respect to cohesion.	[5M]
4	a)	Explain the differences between local and general shear failures and factors considered for their identification.	[4M]
	b)	What are the assumptions in Terzaghi's theory for shallow foundations	[4M]
	c)	A loading test was conducted with a 300 mm square plate at depth of 1 m below the ground surface in pure clay deposit. The water table is located at a depth of 4 m below the ground level. Failure occurred at a load of 45 kN. What is the safe bearing capacity of a 1.5 m wide strip footing at 1.5 m depth in the same soil? Assume γ= 18 kN/m^3 above the water table and a factor of safety of 2.5. The water table does not affect the bearing capacity in both cases. For Φ = 0°, Terzaghi's factors are Nc= 5.7, Nq = 1, and $N\gamma$= 0.	[8M]

5 a) Explain plate load test in detail and its limitations. [8M]

b) Two load tests were conducted at a site - one with a 0.5 m square test plate and the other with a 1.0 m square test plate. For a settlement of 25 mm, the loads were found to be 60 kN and 180 kN, respectively in the two tests. Determine the allowable bearing pressure of the sand and the load which a square footing of 2 m × 2 m, can carry with the settlement not exceeding 25 mm. [8M]

6 a) Explain different classifications of piles with neat sketches. [8M]

b) A square group of 9 piles was driven into soft clay extending to a large depth. The diameter and length of the piles were 30 cm and 9 m respectively. If the unconfined compression strength of the clay is 90 kN/m^2, and the pile spacing is 90 cm centre to centre, what is the capacity of the group? Assume a factor of safety of 2.5 and adhesion factor of 0.75. [8M]

7 a) Explain with neat sketches different tilts and shifts of wells and their rectifying measures. [8M]

b) Explain with a neat sketch different forces acting on well foundations and construction and Sinking of wells. [8M]

*****

Code No: RT32012 **R13** SET - 2

III B. Tech II Semester Regular Examinations April - 2016
GEOTECHNICAL ENGINEERING – II
(Civil Engineering)

Time: 3 hours Max. Marks: 70

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

PART –A

1	a)	What is the need of soil exploration?	[3M]
	b)	Explain finite and infinite slopes.	[4M]
	c)	What are the factors effecting Bearing Capacity?	[4M]
	d)	What are the different types of foundation settlements?	[3M]
	e)	How do you determine the group efficiency of piles?	[4M]
	f)	What are the different shapes of wells and draw neat figures?	[4M]

PART -B

2	a)	Explain with neat figure area ratio, inside and outside clearances of a cutting edge of a sampler used for soil exploration borings.	[4M]
	b)	Write detailed notes on Standard Penetration Test procedure and corrections required.	[8M]
	c)	Write differences between undisturbed and disturbed soil samples.	[4M]
3	a)	What is meant by slope factor of safety?	[3M]
	b)	A cutting is made 10 m deep with sides sloping at 8 : 5 in a clay soil having a Mean undrained strength of 50 kN/m^2 and a mean bulk density of 19 kN/m^3. Determine thefactor of safety under immediate (undrained) conditions given the following details of the impending failure circular surface: The centre of rotation lies vertically above the middle of theslope. Radius of failure arc = 16.5 m. The deepest portion of the failure surface is 2.5 m belowthe bottom surface of the cut (*i.e.*, the centre of rotation is 4 m above the top surface of the cut). Allowance is to be made for tension cracks developing to a depth of 3.5 m from surface. Assume that there is no external pressure on the face of the slope.	[8M]
	c)	Explain Taylor's stability number and how it is modified for different stability conditions of canal slope.	[5M]
4	a)	What are the assumptions in Terzaghi's theory for shallow foundations?	[4M]
	b)	Explain the differences between local and general shear failures and factors considered for their identification.	[4M]
	c)	Explain IS code method for determining soil bearing capacity.	[8M]

5 a) Explain in detail the methods for determining safe bearing pressure based on N- value. [8M]

b) Two load tests were conducted at a site one with a 0.5 m square test plateand the other with a 1.0 m square test plate. For a settlement of 25 mm, the loads were found to be 60 kN and 180 kN, respectively in the two tests. Determine the allowable bearing pressure of the sand and the load which a square footing of 2 m × 2 m, can carry with the settlement not exceeding 25 mm. [8M]

6 a) Explain at least two dynamic formulae of piles. [8M]

b) A square group of 9 piles was driven into soft clay extending to a large depth. The diameter and length of the piles were 30 cm and 9 m respectively. If the unconfined compression strength of the clay is 90 kN/m^2, and the pile spacing is 90 cm centre to centre, what is the capacity of the group? Assume a factor of safety of 2.5 and adhesion factor of 0.75. [8M]

7 a) Explain with neat sketch different components of wells and their functions. [8M]

b) Explain with neat sketches different types of caissons based on their method of construction [8M]

*****

Code No: RT32012 **R13** SET - 3

III B. Tech II Semester Regular Examinations, April - 2016
GEOTECHNICAL ENGINEERING – II
(Civil Engineering)

Time: 3 hours Max. Marks: 70

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

PART –A

1	a)	What are the methods of soil exploration?	[3M]
	b)	Explain types of slope failures.	[4M]
	c)	What is the Criteria for the determination of bearing capacity of soils?	[4M]
	d)	What are the allowable settlements of structures?	[3M]
	e)	What is a negative skin friction?	[4M]
	f)	What is grip length with respect to well foundations?	[4M]

PART -B

2	a)	How do you decide depth and spacing of boring in soil investigation?	[4M]
	b)	Explain in detail about preparation of soil investigation report including. RECORD OF BORING [IS : 1892-1979]	[8M]
	c)	An SPT was conducted in a dense sand deposit at a depth of 22 m, and a value of 48 was observed for *N*. The density of the sand was 15 kN/m^2. What is the value of *N*, corrected for overburden pressure?	[4M]
3	a)	What is meant by slope factor of safety?	[3M]
	b)	A cutting is made 10 m deep with sides sloping at 8:5 in a clay soil having a mean undrained strength of 50 kN/m^2 and a mean bulk density of 19 kN/m^3. Determine the factor of safety under immediate (undrained) conditions given the following details of the impending failure circular surface: The centre of rotation lies vertically above the middle of the slope. Radius of failure arc = 16.5 m. The deepest portion of the failure surface is 2.5 m belowthe bottom surface of the cut (*i.e.*, the centre of rotation is 4 m above the top surface of the cut). Allowance is to be made for tension cracks developing to a depth of 3.5 m from surface. Assume that there is no external pressure on the face of the slope.	[8M]
	c)	Explain Taylor's stability number and how it is modified for different stability conditions of canal slope.	[5M]
4	a)	Explain types of foundations and factors to be considered in their location.	[4M]
	b)	Explain the differences between local and general shear failures and factors considered for their identification.	[4M]

c) [8M]

A loading test was conducted with a 300 mm square plate at depth of 1 mbelow the ground surface in pure clay deposit. The water table is located at a depth of 4 m below the ground level. Failure occurred at a load of 45 kN. What is the safe bearing capacity of a 1.5 m wide strip footing at 1.5 m depth in the same soil? Assume γ= 18 kN/m^3 above the water table and a factor of safety of 2.5. The water table does not affect the bearing capacity in both cases.
For Φ= 0°, Terzaghi's factors are Nc= 5.7, Nq = 1, and $N\gamma$= 0.

5 a) Explain in detail the methods for determining safe bearing pressure based on N-value. [8M]

b) A footing, 2 m square, is founded at a depth of 1.5 m in a sand deposit, forwhich the corrected value of N is 27. The water table is at a depth of 2 m from the surface. Determine the net allowable bearing pressure, if the permissible settlement is 40 mm and a factor of safety of 3 is desired against shear failure. [8M]

6 a) Explain different classifications of piles with neat sketches. [8M]

b) A group of 16 piles of 50 cm diameter is arranged with a centre to centre spacing of 1.0 m. The piles are 9 m long and are embedded in soft clay with cohesion 30 kN/m^2. Bearing resistance may be neglected for the piles. Negative Adhesion factor is 0.6. Determine the ultimate load capacity of the pile group. [8M]

7 a) Explain with neat sketch different components of wells and their functions. [8M]

b) Explain with a neat sketch different forces acting on well foundations and the construction and Sinking of wells. [8M]

*****

Code No: RT32012 **R13** SET - 4

III B. Tech II Semester Regular Examinations, April - 2016
GEOTECHNICAL ENGINEERING – II
(Civil Engineering)

Time: 3 hours Max. Marks: 70

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

PART –A

1	a)	What is the need of soil exploration?	[3M]
	b)	Explain types of slope failures	[4M]
	c)	What is the Criteria for the determination of bearing capacity	[4M]
	d)	What are the allowable settlements of structures?	[3M]
	e)	What is a negative skin friction?	[4M]
	f)	What are the different shapes of wells and draw neat figures?	[4M]

PART -B

2	a)	How do you decide depth and spacing of boring in soil investigation?	[4M]
	b)	Write a detail notes on Standard Penetration Test procedure and corrections required.	[8M]
	c)	Write differences between undisturbed and disturbed soil samples.	[4M]
3	a)	Explain Location of the Most Critical Circle in the method of slices.	[3M]
	b)	Explain Culmann's graphical method and also it's advantages.	[8M]
	c)	An embankment is inclined at an angle of 35° and its height is 15 m. The angle of shearing resistance is 15° and the cohesion intercept is 200 kN/m^2. The unit weight of soil is 18.0 kN/m^3. If Taylor's stability number is 0.06, find the factor of safety with respect to cohesion.	[5M]
4	a)	Explain the differences between local and general shear failures and factors considered for their identification.	[4M]
	b)	Explain types of foundations and factors to be considered in their location	[4M]
	c)	Explain IS code method for determining soil bearing capacity.	[8M]
5	a)	Explain plate load test in detail and its limitations	[8M]
	b)	A footing, 2 m square, is founded at a depth of 1.5 m in a sand deposit, for which the corrected value of *N* is 27. The water table is at a depth of 2 m from the surface. Determine the net allowable bearing pressure, if the permissible settlement is 40 mm and a factor of safety of 3 is desired against shear failure.	[8M]

6 a) Explain at least two dynamic formulae of piles. [8M]

b) A group of 16 piles of 50 cm diameter is arranged with a centre to centre spacing of 1.0 m. The piles are 9 m long and are embedded in soft clay with cohesion 30 kN/m^2. Bearing resistance may be neglected for the piles. Negative adhesion factor is 0.6. Determine the ultimate load capacity of the pile group. [8M]

7 a) Explain with neat sketches different tilts and shifts of wells and their rectifying measures. [8M]

b) Explain with neat sketches different types of caissons based on their method of construction. [8M]

*****