Total No. of Questions : 12]

SEAT No. :

P4265

[Total No. of Pages : 3

[5353]-508

TE. (Civil) (Semester - II)

FOUNDATION ENGINEERING

(2015 Pattern)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q. 9 or Q.10 and Q.11 or Q.12.***
2) ***Neat diagrams must be drawn whenever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary and mention it clearly.***
5) ***Use of non-programmable calculator is allowed.***

SECTION - I

Q1) Discuss SPT and what are the various corrections? What is the importance of the test in geotechnical engineering? **[6]**

OR

Q2) Discuss pressure meter test with diagram. **[6]**

Q3) Differentiate between GSF and LSF and also discuss the effect of water table on bearing capacity equation. **[8]**

OR

Q4) A square footing 2.6m × 2.6m is built in a homogenous bed of sand of unit weight 19KN/m^3 and having an angle of shearing resistance of 36°. The depth of footing 2m below the ground surface. Calculate the safe load. (FOS = 3, Nc = 65.4, Nq=49.4Nγ=54, Use Terzaghi analysis) **[8]**

Q5) Calculate average immediate settlement. Use following data: Footing =4m*2m, depth of foundation=2m, E=48MN/m^2, v=0.5, contact pressure=200kN/m^2, μ_0=78 and μ_1=84. **[6]**

P.T.O.

OR

Q6) A normally consolidated clay stratum of 5 m thickness has two permeable layers at its top and bottom. The liquid limit and the initial void ratio of the clay are 40% and 0.85 respectively, while the initial overburden pressure at the middle of clay layer is 300 kPa. Due to the construction of a new building this pressure increases by 150 KPa. Compute the probable primary consolidation settlement (expressed in mm) of the building. **[6]**

SECTION - II

Q7) a) A group pile consists of 16 piles arranged in 4 rows and 4 columns. Calculate efficiency of pile group by using feld's rule. **[6]**

b) Explain pile load test with its limitation **[6]**

c) What is caisson disease and how it's controlled **[4]**

OR

Q8) a) Explain the procedure of caisson sinking using Sand Island Method. **[5]**

b) Compute the settlement of pile group to carry a load of 3000kN including the weight of pile cap at a site where the soil is uniform clay to a depth of 20 m, underlain by rock and length of pile 10.5m, Diameter of pile 0.5m, no. of pile is 16, spacing of pile is 150cm .average confined compressive strength of the clay is 70kN/m^2. The clay may be assumed to be of normal sensitivity and normally loaded with liquid limit 60%. A factor of safety of 3 is required against shear failure, assume the load transfer at 2/3 length of the pile. **[7]**

c) Explain negative skin friction on Piles with sketch **[4]**

Q9) a) Discuss any two methods of cofferdam. **[7]**

b) List out various soil improvement techniques. Explain preloading techniques **[6]**

c) Explain vibro flotation techniques **[4]**

OR

Q10)a) Explain R C Diaphragm method **[7]**

b) Explain design Principle of under reamed pile **[6]**

c) Explain any four engineering problem associated with black cotton soil. **[4]**

Q11)a) State the various function of Geosynthetic materials and explain any two function **[7]**

b) Enlist the factors considered while selecting geosynthetics materials **[6]**

c) Explain different types of seismic wave **[4]**

OR

Q12)a) What is strong ground motion? Explain any four characteristics **[7]**

b) What are the advantages and disadvantageous geosynthetics over conventional materials **[6]**

c) What is Liquefaction? Discuss the effect of liquefaction **[4]**