Total No. of Questions : 12]

SEAT No. :

P1691

[Total No. of Pages : 3

[5460]-508
T.E. (Civil)
FOUNDATION ENGINEERING
(2015 Pattern) (Semester - II)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the 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 wherever 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) Explain 'Electrical Resistivity Method' with respect to i) Principle ii) Procedure and iii) Limitations. **[6]**

OR

Q2) Differentiate between 'Standard Penetration Test' and 'Dynamic Cone Penetration Test'. **[6]**

Q3) Enlist the assumptions in Terzaghi's bearing capacity analysis and write the equations to calculate ultimate bearing capacity of i) strip footing ii) rectangular footing iii) circular footing. **[7]**

OR

Q4) Two plate load tests with square plates were conducted. Following loads were obtained for 30 mm settlement. i) For plate with width 300 mm, the load was 38.2 kN. ii) For plate with width 600 mm, the load was 118.5 kN. Determine the width of square footing which would carry a load of 1500 kN for a settlement of 30 mm. **[7]**

P.T.O.

Q5) Define pre-consolidated soil. Comment on over consolidation ratio of this soil. What are the causes of pre-consolidation of soil? **[7]**

OR

Q6) Determine the consolidation settlement of a clay layer 2.0 m thick at a depth of 10 m below the ground level, if water table is lowered from ground level to 1.0 m depth. The clay layer underlays the sand layer. The soil properties are as below. **[7]**

Clay – w = 35%, w_L = 45%, γ_b = 9.5 kN/m^3, G = 2.7

Sand – γ_b = 10 kN/m^3, γ_{moist} = 17.5 kN/m^3, G = 2.65

SECTION - II

Q7) a) What is negative friction? Enlist the measures to reduce it. **[5]**

b) Enlist the advantages and disadvantages of drilled piers. **[6]**

c) How the capacity of single pile is calculated by static method. **[6]**

OR

Q8) a) A pile group consists of 12 piles in 3 columns and 4 rows. Calculate the efficiency of the pile group by Feld's rule. **[5]**

b) Enlist the advantages and disadvantages of pneumatic caissons over open caissons. **[6]**

c) Explain the method to calculate the consolidation settlement of pile group in clay assuming all piles as friction piles. **[6]**

Q9) a) State and explain any five methods to anchorage sheet pile. **[5]**

b) Enlist any three types of cofferdams and draw their sketches. **[6]**

c) Draw a neat sketch of double under reamed pile and name various components. **[6]**

OR

Q10) a) Write a note on 'Cellular cofferdam'. What are it's advantages? **[5]**

b) Explain 'stone column technique' of ground improvement. **[6]**

c) Explain the design principles to be followed during the construction of foundation on black cotton soil. **[6]**

Q11) a) Write a note on 'liquefaction hazard mitigation'. **[5]**

b) Explain general principles of earthquake resistant design. **[5]**

c) What are the advantages of geosynthetics over conventional materials? **[6]**

OR

Q12) a) Write a note on 'Intensity of Earthquake'. **[5]**

b) State any five functional requirements of geosynthetics. **[5]**

c) Enlist the types of geosynthetics and explain any two in detail. **[6]**

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