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8E4031

Roll No. _____

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B.Tech. VIII Semester (Old Back) Examination, April/May-2017
Civil Engineering
8CE1(O) Geotechnical Engineering-II

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 26**Instructions to Candidates:**

Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal marks**. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit-I

1. a) Explain Westergard's theory for determination of the vertical stress at a point. Discuss various approximate methods for determination of the vertical stress at a point. What are their limitations. (8)
- b) A concentrated load of 200t is applied at the ground surface. Compute the vertical pressure : (4+4)
 - i) At a depth of 5m below the load.
 - ii) At a distance of 4m at the same depth. Use Boussinesq's equation.

(OR)

1. a) What do you understand by Isobar? Show the isobar for two load intensities and explain the application of the same. (8)
- b) What are the assumptions of Boussinesq's analysis of stresses due to vertical loads, draw stress distribution diagram due to point load. (4+4)
 - i) A long vertical line and
 - ii) A long Horizontal line

Unit-II

2. a) What are assumptions of Terzaghi's one dimensional theory of consolidation? Discuss its limitations. (8)
- b) A clay soil sample 24mm thick was obtained from the field and tested in the laboratory. The sample reached 50% Consolidation in 25minutes. If the thickness of the layer from which the sample was taken is 4.8m, how much it will take to reach same degrees of consolidation. (4+4)
- i) If the layer has double drainage
- ii) If the layer has single drainage

(OR)

2. a) What is difference between compaction and consolidation? (8)
- b) Define the terms "Compression Index" "Coefficient of Consolidation" and coefficient of compressibility and indicate their units and symbols. (8)

Unit-III

3. a) Describe culmann's method for stability analysis of homogeneous slope. What are its limitations? (8)
- b) Describe frictional circle method of stability of slope. (8)

(OR)

3. What are different types of slope failure? Derive an expression for the factor of safety of infinite slope in a cohesionless soil. (16)

Unit-IV

4. a) Write short notes : (3×2=6)
- i) Earth pressure at rest
- ii) Active earth pressure
- iii) Passive earth pressure
- b) What are the assumptions of Rankine's theory? Derive the expressions for active pressure. (10)

(OR)

4. a) Explain culmann's graphical method for active earth pressure. (8)
- b) A retaining wall has a vertical back and is 8m high, with horizontal backfill. Determine active and passive earth pressure on wall per unit length. Take $C = 100 \text{ kN/m}^2$ (8)

$$\phi = 0$$

$$r = 1g \text{ kN/m}^3$$

Unit-V

5. a) Describe plate load test. What are its limitation and uses? (10)
- b) Explain the following : (3×2=6)
- i) Ultimate bearing capacity
 - ii) Allowable bearing pressure
 - iii) Gross load intensity

(OR)

5. a) What are the assumptions of Terzaghi's theory of bearing capacity? Discuss its limitations. (8)
- b) Determine net safe bearing capacity of a footing of size $2\text{m} \times 3\text{m}$ resting at a depth of 1.5m on a soil having $\rightarrow C = 0, \phi = 35^\circ, r = 18\text{kN/m}^3$ Take $N_c = 25, N_q = 13, N_r = 11$. (8)

