Total No. of Questions : 8]

SEAT No. :

PE-4230

[Total No. of Pages : 2

[6582]-1
S.E. (Civil)
GEOTECHNICAL ENGINEERING
(2019 Pattern) (Semester - IV) (201008)

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***
2) ***Neat diagrams must be drawn whenever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data if necessary and mention it clearly.***
5) ***Use of Calculator is allowed.***

Q1) a) Define Compaction. Compare between Compaction and consolidation. **[6]**

b) A soil sample has specific gravity 2.62 and Maximum Dry Density 1650 kg/m^3 at a moisture content of 10%. Find Degree of Saturation, air content and percentage air voids at Maximum Dry density. **[6]**

c) What is pressure bulb? Explain its significance and draw neat sketch of pressure bulb for concentrated point loading. **[5]**

OR

Q2) a) Write the equation for stresses in soil for point loading by Boussinesq's and Westergaard's theory and assumptions of these theorise. **[5]**

b) A concentrated load of 450 kN is applied at a ground surface compute the vertical pressure : **[6]**

i) At a depth 6m below the load

ii) At a distance 6m at same depth.

c) Explain standard proctor compaction test. **[6]**

Q3) a) Explain in detail Skempton's Pore pressure parameters. **[5]**

b) A soil sample fails under an axial stress of 250 kN/m^2 when laterally unconfined. The failure wedge is making an angle of 50^o with horizontal. Calculate Cohesion & angle of internal friction of soil. **[6]**

c) Write short note on Thixotropy and Sensitivity of clay. **[6]**

OR

P.T.O.

Q4) a) Explain in detail factors affecting shear strength of soil. **[5]**

b) In vane shear test on clay, the following observations are made Applied Torgue : 180 kg cm, Height of vane : 10cm Diameter of Vane : 5cm, calculate shear strength of clay. **[6]**

c) Explain in detail Triaxial Compression Test. **[6]**

Q5) a) Explain in detail earth pressure at rest. Draw pressure distribution diagram for retaining wall with height h and Unit weight of soil in backfill = γ. **[6]**

b) Write short note on Coulomb's Wedge Theory in detail. **[6]**

c) A smooth vertical wall retains a level backfill with γ = 20 kN/m^3, Φ = 32^o and C=0 to a depth of 8m. Draw lateral pressure diagram and compute the total thrust on the retaining wall. What will be active pressure if water stands at a depth of 3.5m? **[6]**

OR

Q6) a) Explain Rebhann's graphical method for determination of earth pressure on retaining wall. **[6]**

b) In a cohesionless soil deposit having unit weight of 20 kN/m^3 and Φ = 32^o. Determine active and passive lateral pressure intensities at depth of 8m. **[6]**

c) Discuss points of difference between Rankines and Coulombs theory of earth pressure. **[6]**

Q7) a) Determine the critical height of excavation for vertical cut in cohesive soil, if C=20kN/m^3 and γ = 20kN/m^3. **[6]**

b) Differentiate between Finite and Infinite slopes. **[6]**

c) What is stability number? What is its utility in the analysis of stability of slopes. **[6]**

OR

Q8) a) Determine the stability number for vertical cut in a cohesive soil with following details, γ = 18 kN/m^3, C = 15 kN/m^3, Φ= 32^o. **[6]**

b) What are the assumptions that are generally made in the analysis of slopes? Discuss validity of such assumptions in brief. **[6]**

c) Discuss various types of slope failures in detail. **[6]**

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