

End Semester Examinations - 2015-16 Even Semester - May 2016

14CE2007 Soil Mechanics

Set A

Time : 3 hrs
Total Marks: 100

1. A sample of wet soil has a volume of 0.0192 m^3 and a mass of 32 kg. When the sample is dried out in an oven, its mass reduced to 28.5 kg. Determine (i) the bulk density (ii) water content (iii) dry density (iv) saturated density (v) void ratio (vi) porosity (vii) degree of saturation. Assume the specific gravity of solids as 2.65.

OR
2. A soil has a porosity of 40 percent. The specific gravity of solid is 2.70. Calculate (a) Voids ratio (b) dry density (c) unit weight of soil is 50% saturated and (d) unit weight if the soil is completely saturated.
3. Write the experimental procedure to determine the consistency limit of clayey soil

OR
4. a) Write a note on IS classification of soil. (10)
b) In a constant head permeameter test the following observation were taken
Distance between piezometer tapping = 100mm
Difference of water levels in piezometers = 60 mm
Diameter of test sample = 100 mm
Quantity of water collected = 350 ml
Duration of test = 270 sec
Determine the coefficient of permeability (10)
5. Describe the laboratory method for the determination of optimum moisture content. With neat sketch. State its advantages

OR
6. a) Explain spring analogy test for primary consolidation. (10)
b) Write the assumptions of Terzaghi's one dimensional consolidation theory (10)
7. A soil deposit is subjected to a surcharge load of 40 kN/m^2 at the ground level. The soil deposit consists of four layers: (1) a partially saturated layer of density 16.5 kN/m^3 to a depth of 4m (2) partially saturated layer of density 17 kN/m^3 to a depth of 2.5 m (3) saturated layer of density 18.7 kN/m^3 to a depth of 3.2 m (4) saturated layer of density 19.2 kN/m^3 to a depth of 4 m. Plot the diagram showing the total stress, pore water pressure and effective stress.

OR
8. Explain the various test used to determine the shear strength of soil
9. A concentrated load of 1000 kN is applied at the ground surface. Compute the vertical pressure
(i) at a depth of 4 m below the load,
(ii) at a distance of 3 m at the same depth. Use Boussinesq's equation.

