

TH-II Geo Tech. Engg

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1& 2
 Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10
 - a. What is block diagram? What is its use?
 - b. What is Density Index?
 - c. Define Uniformity Coefficient.
 - d. State Darcy's Law.
 - e. Differentiate between compaction and consolidation of soil.
 - f. State Mohr- Coulomb's equation of shear failure.
 - g. Differentiate between active and passive earth pressure.
 - h. Define MDD and OMC.
 - i. What is Zero air void line?
 - j. What is bearing capacity of soil?
2. Answer **Any Six** Questions 6 x 5
 - a. Explain the origin and formation of Soil.
 - b. Derive the relation between Void ratio and porosity.
 - c. What is Consistency of Soil? Explain different types of Atterberg indices.
 - d. Discuss about Plasticity Chart.
 - e. Write short note on Quick sand condition.
 - f. Compute the active and passive earth pressure force at a depth of 8m in a dry cohesionless sand with angle of internal friction 30 degree and unit weight 18 KN/m^3 .
 - g. How many cubic meter of earth fill can be constructed at a void ratio of 0.67 from 190000 m^3 of borrow material that has a void ratio of 1.1?
3. What do you mean by sedimentation analysis? Give a brief description about pipette method. 10
4. In a consolidation test void ratio decreased from 0.70 to 0.65 when the load was changed from 50 KN/m^2 to 100 KN/m^2 . Compute compression index and coefficient of volume change. 10
5. The mass and volume of a saturated clay specimen were 29.8 gm and 17.7 cm^3 respectively. On oven drying the mass got reduced to 19 gm and volume to 8.9 cm^3 . Calculate shrinkage limit, shrinkage ratio and volumetric shrinkage. Also compute G of soil. 10
6. A cylindrical mould of diameter 7.5 cm contains 15 cm long sample of sand. When water flows through the soil under constant head at a rate of 55 cc/minute, the loss of head between two point 8 cm apart is found to be 12.5 cm. Determine the coefficient of permeability of soil. 10
7. What are the types of shear failures? Describe with neat sketches. 10