III-SEM./CIVIL ENGG./ 2021(W)

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