Roll No. | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 09

B.Voc. (Building Construction & Technology) (Sem.–4)

SOIL MEHANICS

Subject Code : BVBCT-404-20

M.Code : 91640

Date of Examination : 24-12-22

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Answer briefly :

a) What is Hydrometer analysis? Give its application in soil mechanics.

b) What do you understand by dry side and wet side of OMC?

c) Significance of consolidation settlement for buildings.

d) In an Unconfined Compressive Strength test value of UCS was found to be 20KN/m^2. Determine undrained Cohesion.

e) Discuss base and toe failure in slope stability analysis.

f) Define Darcy's law.

g) What are phase diagrams of soils? Make phase diagram for fully saturated soil?

h) In a Vane shear test on saturated clay a torque of 40 N-mm was required to shear the soil. Diameter and height of blade used was 7.5 cm and 11.25cm respectively. Calculate undrained shear strength of soil.

i) A compressible medium of soil having thickness of 3m and coefficient of volume decrease as 0.002cm^2/N at a pressure increment of 75kN/m^2 on center of layer. Calculate amount of settlement.

j) Enumerate drainage conditions for Triaxial shear strength test.

SECTION-B

2. Prove the relationship that degree of saturation of a partially saturated spil can be expressed as : Where γ = bulk density, G = Sp. Gravity and w water content.

$$S = \frac{w}{\frac{\gamma w}{\gamma}(1+w) - \frac{1}{G}}$$

3. A layer of soft clay is 6 m thick and lies under a newly constructed building. The weight of sand overlying the clay layer produces a pressure of 260 kN/m^2 and the new construction increases the pressure by 100 kN/m^2. If the compression index is 0.5, compute the settlement. Water content is 40% and G = 2.65.

4. A layer of soft clay is 5 m thick has initial void ratio of 1.50 and the effective overburden pressure of 120kN/m^2. When the sample is subjected to an increase of pressure of 120 kN/m^2, the void ratio reduces to 1.44. Determine the coefficient of volume compressibility and final settlement of stratum.

5. List the factors affecting permeability of soils.

6. Explain friction circle method of stability analysis.

SECTION-C

7. Derive with assumptions, Terzaghi's theory of one dimensional consolidation.

8. Explain :

   a) Particle size distribution curve

   b) NCC clay and OC clay.

9. Write short notes on the following:

   a) Engineering classification of soils as per IS system

   b) Laplace's equation.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.