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Total No. of Questions : 18

B.Tech. (CE) (2012 to 2017) (Sem.–5)
GEOTECHNICAL ENGINEERING
Subject Code : BTCE-502
M.Code : 70513

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

Answer briefly :

1. Describe oven drying method for the determination of water content of a soil sample.

2. Write name of any four tests used for determination on in-situ unit weight.

3. What is passive earth pressure?

4. What do you understand about index properties?

5. Define plastic limit?

6. Give any two assumptions of wedge theory.

7. Show plot of variation of B-factor (pore pressure coefficient) with degree of saturation.

8. Define Skempton's pore pressure parameter.

9. Which type of roller is the most suitable for compacting subgrade with high plastic clays?

10. Distinguish between seepage velocity and superficial velocity.

SECTION-B

11. Develop a relationship between the void ratio, water content, specific gravity of particles and degree of saturation.

12. Give the structure and characteristics of montmorilonite clay minerals.

13. Explain concept of O.M.C. and zero air void line with the help of a diagram.

14. In a consolidation test on a soil, the void ratio of the sample decreased from 1.25 to 1.10 when the pressure is increased from 200 kN/m^2 to 400 kN/m^2. Calculate the coefficient of consolidation if the coefficient of permeability is 8×10^{-8} cm/sec.

15. What is a flow net? Describe its properties and applications. Describe different methods used to construct the flow net.

SECTION-C

16. The results of two drained triaxial tests on saturated clay are given as :

    Specimen I: $\sigma_3 = 69$ kN/m^2

    $\sigma_d = 213$ kN/m^2

    Specimen II : $\sigma_3 = 120$ kN/m^2

    $\sigma_d = 258.7$ kN/m^2

    Calculate shear strength parameters of the soil.

17. Obtain the differential equation defining the one - dimensional consolidation as given by Terzaghi, listing the various assumptions.

18. Define the following :

    (a) Void ratio

    (b) Specific gravity of particles

    (c) Degree of saturation

    (d) Dry density

    (e) Porosity

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.