

5E5063	Roll No. <u>1580708049</u>	[Total No. of Pages : <u>2</u>]
	5E5063	
	B.Tech. V Semester (Main/Back) Examination, Nov./Dec. - 2017 Civil Engineering 5CE3A Geotechnical Engineering - I	

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 26

Instructions to Candidates :

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit - I

1. a) Explain the Hydrometer test in detail with stretches. (8)
- b) A soil has a porosity of 40%, The specific gravity of solids 2.65 and a water content of 12%. Determine the weight of water required to be added to 100 m³ of this soil for full saturation. (8)

OR

1. a) Write about the is classification system of soil in detail. (8)
- b) Explain the liquid limit, plastic limit and shrinkage limit with fig and methods to find shrinkage limit. (8)

Unit - II

2. a) What are the different types of soil structures which can occur in nature. Describe in detail. (8)
- b) Discuss the characteristics and construction of montmorillonite' and Illite mineral groups. (8)

OR

2. a) What are different methods for determination of the co-efficient of permeability in laboratory. Discuss their limitations. (8)
- b) Explain permeability of stratified soil mosses. (8)

Unit - III

3. a) What is quick sand? How would you calculate hydraulic gradient required to create quick sand conditions in a sample of sand? (8)
- b) Define total stress, neutral stress and effective stress. What is importance of effective stress. (8)

OR

3. a) Explain the term piping and uplift pressure. (8)
- b) Explain the method of constructing a flow net in an earth dam consisting of two different zones. (8)

Unit - IV

4. a) Describe direct shear test. What are its merits and demerits. (8)
- b) Explain unconfined compression test with fig. What is advantage over triaxial test. (8)

OR

4. a) A cylindrical specimen of saturated clay, 4 cm in diameter and 9 cm in overall length is tested in unconfined compression tester. The length of specimen after failures is 8 cm. Find the unconfined compressive strength of clay, if the specimen fails under and axial load of 46.5 N. (8)
- b) What is Mohr's strength theory for soils stretch typical strength Envelop for a clean sand. (8)

Unit - V

5. a) Describe standard proctor test and Modified proctor tests. (8)
- b) What are the factors that effect compaction? Discuss in brief. (8)

OR

5. a) What are the different methods of compaction in field. How would you select the type of roller. (8)
- b) What is mechanical stabilization. What are factors that affect the mechanical stability of mixed soil. (8)

$$e = 0.01$$

$$e = \frac{c_{us} \sqrt{w}}{\gamma_d} - 1$$

$$0.01 + 1 = 2.70 \left(\frac{\sqrt{w}}{\gamma_d} \right)$$

(2)

$$\frac{\sqrt{w}}{\gamma_d} = 0.374, \quad w_s = \frac{\sqrt{w}}{\gamma_d} - \frac{1}{d}$$

$$= 0.374 - \frac{1}{2.70}$$

$$= 0.37\%$$

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