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320553(20)

B. E. (Fifth Semester) Examination, April-May 2021

(Civil Engg.)

GEOTECHNICAL ENGINEERING-I

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : *Attempt all questions. Part (a) of each question is compulsory. Attempt any* ***one*** *part from (b) and (c)*

Unit-I

1. (a) Define soil mechanics. 2

   (b) The mass specific gravity of a fully saturated specimen of clay having a water content of 30.5% is 1.96. On oven drying; the mass specific gravity drops to 1.60. Calculate the specific gravity of clay. 14

(c) Derive the formula between soil moisture content, degrees of saturation, specific gravity and void ratio. Saturated clay has a water content of 40% and bulk specific gravity of 1.90. Determine the void ratio and specific gravity of particles. 14

Unit-II

2. (a) What are importances of A line.? 2

(b) Discuss IS and HRB classification of soil. 14

(c) (i) Describe the US Bureau of soils textural classification.

(ii) Describe filed identification tests to distinguish between clay and slit. 14

Unit-III

3. (a) Define MDD. 2

(b) (i) Derive an expression for zero air void line.

(ii) What are the various factors that affect the compaction of soil in the filed? 14

(c) Define optimum moisture content of a soil and state on what factors it depends. 14

Unit-IV

4. (a) Define consolidation. 2

(b) Explain Newmark's chart and Westergaard's equations. 14

(c) Explain decompression, virgin and recompression curve in consolidation for clay soil. 14

Unit-V

5. (a) Define shear strength parameter. 2

(b) What are the advantages and disadvantages of a triaxial compression test? Briefly explain how you conduct the test and compute the shear parameters for the soil from the test data. 14

(c) Write brief critical notes on : 14

(i) Mohr's circle

(ii) Unconfined compression test

(iii) Vane shear test