Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov/Dec– 2017**

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| **Code :** | **14CE2007** | **Duration :** | **3hrs** |
| **Sub. Name :** | **SOIL MECHANICS** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Write the experimental procedure to determine the consistency limit of clayey soil. | CO1 | 10 |
| b. | In its natural condition, a soil sample has a mass of 1.980 kg and a volume of 0.001 m3. After being completely dried in an oven, the mass of the sample is 1.800 kg. Specific gravity G is 2.7. Unit weight of water is 10 kN/m3. What is the degree of saturation of the soil? | CO1 | 10 |
| (OR) | | | | |
| 2. | a. | Briefly explain the classification of soil by Indian standard classification system. | CO1 | 10 |
| b. | Sketch the particle size distribution curve for fine grained soil, well graded soil, coarse grained soil, and uniformly graded soil. | CO1 | 5 |
| c. | Describe the laboratory method for the determination of specific gravity. | CO1 | 5 |
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| 3. | a. | Describe the method for determination of liquid, plastic and shrinkage limit of soil? | CO1 | 12 |
| b. | In a falling head permeability test on a sample 12.2 m high and 44.41cm2 c/s area, the water level in a stand pipe of 6.25 mm internal diameter dropped from a height of 75 cm to 24.7 cm in 15 minutes. Find the coefficient of permeability. | CO1 | 8 |
| (OR) | | | | |
| 4. | a. | Define particle size distribution curve? How will you determine the uniformity coefficient and the coefficient of curvature? | CO2 | 5 |
| b. | List out the factors affecting permeability of soils? | CO2 | 5 |
| c. | What is a flow net? Explain any one method of construction of flow net. | CO2 | 10 |
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| 5. | a. | What do you mean by compaction? List down the factors affecting compaction. | CO2 | 10 |
|  | b. | Differentiate between consolidation and compaction. | CO2 | 5 |
|  | c. | A horizontal stratified deposit consists of three layers, each uniform in itself. The permeabilities of the layers are 8 x 10-6 m/sec, 50 x 10-6m/sec and 5 x 10-6 m/sec and their thickness 6m, 3m and 9m respectively. Find the effective average permeability of the deposit in the horizontal and vertical direction. | CO2 | 5 |
| (OR) | | | | |
| 6. | a. | Describe Standard Proctor test and the modified Proctor test. How would you decide the type of the test to be conducted in the laboratory? | CO2 | 15 |
|  | b. | What is a compaction curve? Give its salient features. What is a zero-air void line? | CO2 | 5 |
| 7. |  | A soil deposit is subjected to a surcharge load of 40 kN/m2 at the ground level. The soil deposit consists of four layers: i. a partially saturated layer of density 16.5 kN/m3 to a depth of 4m ii. partially saturated layer of density 17 kN/m3 to a depth of 2.5 m iii. saturated layer of density 18.7 kN/m3 to a depth of 3.2 m iv. saturated layer of density 19.2 kN/m3 to a depth of 4 m. Plot the diagram showing the total stress, pore water pressure and effective stress. | CO3 | 20 |
| (OR) | | | | |
| 8. | a. | Discuss the basis of the construction of Newmark’s influence chart. How it is used? | CO3 | 10 |
|  | b. | With a neat sketch, elaborate on any two laboratory methods of determination of shear strength of soil. | CO3 | 10 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | A concentrated load of 1000 kN is applied at the ground surface. Compute the vertical pressure  i. at a depth of 4 m below the load,  ii. at a distance of 3 m at the same depth. Use Boussinesq's equation. | CO3 | 10 |
|  | b. | Discuss the friction circle method for the stability analysis of slopes. Can this method be used for purely cohesive soil? | CO3 | 10 |

ALL THE BEST