

**ANURAG Engineering College**

(An Autonomous Institution)

III B.Tech I Semester Supplementary Examinations, June/July-2024

**GEOTECHNICAL ENGINEERING****(CIVIL ENGINEERING)****Time: 3 Hours****Max. Marks: 75****Section – A (Short Answer type questions)****(25 Marks)****Answer All Questions**

	<b>Course Outcome</b>	<b>B.T Level</b>	<b>Marks</b>
1. Define relative density	CO1	L1	2M
2. Explain about IS classification of soil?	CO1	L2	3M
3. State Darcy's law.	CO2	L1	2M
4. Explain the factors which affect the permeability?	CO2	L2	3M
5. Find out the vertical stress under a single concentrated load using Boussinesque equation.	CO3	L1	2M
6. Explain about the mechanism of compaction.	CO3	L2	3M
7. What is meant by consolidation?	CO4	L1	2M
8. Explain the term immediate settlement, primary consolidation and secondary consolidation	CO4	L2	3M
9. Define slope failure and base failure.	CO5	L1	2M
10. Explain the coulomb's shear strength equation and list the shear strength parameters	CO5	L2	3M

**Section B (Essay Questions)****Answer all questions, each question carries equal marks.****(5 X 10M = 50M)**

11. A) i) Construct the phase diagram for completely dry and fully saturated soil mass?  
ii) Analyze the consistency limits of the soil and mark the various phase with neat sketch.
- OR**
- B) A cubic meter of soil in its natural state weighs 17.75kN, after being dried it weighs 15.08kN. The specific gravity of the soil is 2.7. Determine the degree of saturation, void ratio, porosity and water content of the original soil sample
12. A) Write down the procedure for determination of permeability by constant head test in the laboratory with neat sketch.
- OR**
- B) i) The following data were recorded in a constant head permeability test.  
Internal diameter of permeameter = 7.5 cm  
Head lost over a sample length of 18 cm = 24.7 cm  
Quantity of water collected in 60 sec = 626 ml  
Porosity of soil sample was 44%  
Calculate the coefficient of permeability of the soil. Also determine the discharge velocity and seepage velocity during the test.  
ii) List out the methods to find out the coefficient of permeability.
13. A) Develop an expression for Boussinesq's equation for point load with their assumption?

**OR**

- B) Analyze briefly about the laboratory method to determine compaction and state the factors affecting compaction. CO3 L3 10M
14. A) Construct with neat sketch about the square root time for the determination of coefficient of consolidation CO4 L3 10M
- OR**
- B) Analyze Terzhaghi's one dimensional consolidation theory with a neat sketch. CO4 L3 10M
15. A) Experiment the direct shear test with neat diagram? State the merits and demerits of the test? CO5 L3 10M
- OR**
- B) Demonstrate the term Liquefaction of soil with neat diagram. CO5 L3 10M