**SP - 98**

**Total No. of Pages : 2**

| Seat No. | |
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# T.Y. B.Tech. (Civil Engineering) (Semester - V) (CBCS) Examination, December - 2023

## PCC-CV503 : GEOTECHNICAL ENGINEERING - I

## Sub. Code : 80766

9586

**Day and Date : Monday, 04 - 12 - 2023** **Total Marks : 70**

**Time : 10.30 a.m. to 1.00 p.m.**

**Instructions :**
1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Assume suitable data if necessary and state them clearly.**
4) **Answer shall be supported by adequate sketches.**

## SECTION - I

**Q1)** Attempt any two questions. **[12]**

a) Explain with sketch phase diagrams for the partially saturated soil and dry soil.

b) What is meant by consistency of soil? Draw a plasticity chart.

c) The specific gravity and void ratio of a sample of clay are 0.73 and 2.7 respectively. If the voids are 90% saturated find bulk density, dry density and water content.

**Q2)** Attempt any two questions. **[12]**

a) Differentiate between seepage velocity and discharge velocity.

b) Explain laboratory method for determination of coefficient of permeability for coarse grained soil with equation and sketch.

c) Calculate effective stress, pore pressure and total stress at 6m below ground level where water table is at 3m below ground level. For following properties of soil, dry unit weight of soil 16.5 KN/cum, moisture content of soil above water table 15% and specific gravity of soil 2.7.

***P.T.O.***

**Q3)** Attempt all questions. **[11]**

a) Explain standard proctor test with neat sketch.

b) List types of compaction equipment's and their suitability.

9586

## SECTION - II

**Q4)** Attempt any two questions. **[12]**

a) Find intensity of vertical pressure at a point 3 m directly below 25 KN point load acting on a horizontal ground surface. What will be the vertical pressure at a point 2m horizontally away from the axis of loading and at same depth of 3 m? Use Boussinesq's equation.

b) State the assumptions made in Westergards analysis in stress distribution.

c) Discuss Equivalent point load method.

9586

**Q5)** Attempt all questions. **[11]**

a) Discuss the classification of shear test based on drainage conditions.

b) Explain triaxial shear test with merits and demerits.

**Q6)** Attempt any two questions. **[12]**

a) Compute intensities of active and passive earth pressure at a depth of 8m in cohesion less soil with $\phi$ =30° and $\gamma_d$= 18KN/cum. What will be active and passive pressure.

b) Differentiate between Rankine's and Coulombs theories of earth pressure.

c) What are different types of earth Pressure?

9586

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