SEMBODAI RUKMANI VARATHARAJAN ENGINEERING COLLEGE
SEMBODAI - 614809
BACHALOR OF ENGINEERING
DEPARTMENT OF CIVIL ENGINEERING
ASSIGNMENT TITLE

Sub.Code   : CE6405   **Branch / Year / SEM:** CIVIL / II / IV

Sub.Name:SOIL MECHANICS   **Batch:** 2014-2018

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ASSIGNMENT- I (UNIT 1&2)

PART A (2 MARKS)

1. Give the relation between γ_{sat}, G, γ_w and e.

2. Define: (a) Porosity (b) Void ratio.

3. Define the teams of plastic index, saturated mass density?

4. Write the major soil classifications as per Indian Standard Classification System.

5. Define effective size of particle in sieve analysis.

6. What are the different types of soil water?

7. State and explain Darcy's law.

8. What is capillary rise?

9. What is pore pressure?

10. What are the uses of flow net

PART B (16 MARKS)

1. The mass of wet soil when compacted in a mould was 19.55 KN. The water content of the soil was 16%. If the volume of the mould was 0.95 m^3. Determine (i) dry unit weight, (ii) Void ratio, (iii) degree of saturation and (iv) percent air voids. Take G = 2.68.

2. A soil sample has a porosity of 40 per cent. The specific gravity of solids is 2.70. Calculate i) Voids ratio ii) Dry density and iii) Unit weight if the soil is completely saturated.

3. A soil has a bulk unit weight of 20.11 KN/m^3 and water content of 15 percent. Calculate the water content of the soil partially dries to a unit weight of 19.42 KN/m^3 and the voids ratio remains unchanged.

4. Explain Standard Proctor Compaction tests with neat sketches

5. Explain in detail the procedure for determination of grain size distribution of soil by sieve analysis

6. Water table in a deposit of sand 8 m thick is at a depth of 3 m below the ground surface. Above the water table, the sand is saturated with capillary water. The bulk density of sand is 19.62 kN/m^3. Calculate the effective pressure at 1m, 3m and 8m below the ground surface. Hence plot the variation of total pressure, neutral pressure and effective pressure over the depth of 8m

7. Write down the procedure for determination of permeability by constant head test in the laboratory.

8. The discharge of water collected from a constant head permeameter in a period of 15 minutes is 500 ml. the internal diameter of the permeameter is 5 cm and the measured difference in head between two gauging points 15 cm vertically apart is 40 cm. calculate the coefficient of permeability. If the dry weight of the 15 cm long sample is 486 gm and the specific gravity of the solids is 2.65, calculate the seepage velocity.

ASSIGNMENT- II (UNIT 3, 4 & 5)

PART A (2 MARKS)

1. What are the assumptions made in Terzaghi's one dimensional consolidation theory

2. Write down the use of influence charts.

3. What are isobars?

4. List the components of settlement in soil

5. Write down the Mohr's-Coulomb failure envelope equation.

6. State the principles of Direct shear test?

7. What is the effect of pore pressure on shear strength of soil?

8. What is shear strength of soil?

9. Write down the Coulomb's expression for shear strength

10. Define 'angle of repose' of soil.

PART B (16 MARKS)

1. Explain the procedure to calculate the factor of safety of a finite slope possessing both cohesion and friction (c - Φ) by method of slices

2. Write down the procedure for determining the factor of safety of a given slope by friction circle method

3. Obtain the relationship between the principal stresses in triaxial compression test using Mohr-Coulomb failure theory

4. Write down a step by step procedure for determination of cohesion of a given clayey soil by conducting unconfined compression test.

5. Explain with neat sketches the procedure of conducting direct shear test. Give its advantages over other methods of finding shear strength of soil

6. Explain the direct shear test to determine the shear strength of soil.

7. Derive Boussinesque equations to find intensity of vertical pressure and tangential stress when a concentrated load is acting on the soil.

8. Explain the Newark's influence chart in detail.

STAFF INCHARGE   **HOD**