SHAHEED BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZEPUR

ROLL No: | | | | | | | | | | | | |

Total number of pages:02
Total number of questions:06

B.Tech. || CE || 5th Sem

Geotechnical Engineering

Subject Code: BTCE-502

Paper ID:

Time allowed: 3 Hrs **Max Marks: 60**

Important Instructions:

- **All questions are compulsory**
- **Assume any missing data**

PART A **(10 × 2 = 20)**

Q 1. Short-Answer Questions:

a) Explain the characteristics of Kalonite mineral.

b) Define the term Uniformity coefficient.

c) Why is classification of soils required.

d) Differentiate between void ratio and porosity.

e) Discuss normally consolidated, over consolidated and under consolidated clay.

f) Define the term Compression Index.

g) Define the term Pervious and Impervious soil with example.

h) What are the differences between the Compaction and Consolidation.

i) What do you mean by Uniformity Coefficient and Coefficient of Curvature.

j) Define Darcy's law.

PART B **(5 × 8 = 40)**

Q 2. What do you mean by Specific Gravity. Prove that $e = wG/S$. CO1

OR

What are different Index Properties and Engineering Properties. Discuss the importance of Atterberg's limits in soil engineering.

Q 3. A soil sample with a unit weight of 1.92 t/m^3, w = 11% and specific gravity of soil solid = 2.66. Find out dry unit weight, void ratio and degree of saturation. CO1

OR

What is the effect of compaction on:

i) Soil structure

ii) permeability

iii) shear strength

iv) compressibility and swelling of soils

Q 4. Define Permeability. Explain the different factors affecting permeability of soil. CO2 & CO4

OR

Explain the different methods for the determination of the coefficient of permeability in a laboratory.

Q 5. What is the significance of compaction of soils. Describe how quality control is ensured in constructing an earth embankment. CO3

OR

What are the assumption of Terzaghi's theory of consolidation of saturated soil mass subjected to a static load steady flow.

Q 6. Write short notes on any two of the following: CO5 & CO6

a) Triaxial shear test

b) Friction circle method

c) Grain size analysis

OR

Write short notes on any two of the following:

a) Pore pressure parameters

b) Mohr Coulomb Theory for shear strength

c) merits and demerits of triaxial shear test