

Roll No.

Printed Pages : 2

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BT-4 / M-18
SOIL MECHANICS
Paper-CE-208E

Time allowed : 3 hours]

[Maximum marks : 100

Note :- Attempt five questions in all, selecting at least one question from each unit. Assume missing data, if any suitably.

Unit-I

1. (a) What do you understand by the following?
 - (i) Alluvial Soil and how is it formed? 10
 - (ii) Structure of KAOLINITE clay mineral. 10
- (b) What is meant by consistency limits of soils? Discuss the physical significance of these limits. 10
2. (a) Discuss IS Soil classification of coarse grained soils, when fines present in the soil are,
 - (i) Less than 5% 10
 - (ii) Greater than 12% 10
- (b) Discuss the factors affecting coefficient of permeability of soils. 10

Unit-II

3. (a) Discuss the properties and utilities of a flow net. 10
- (b) Discuss briefly the following: 10
 - (i) Capillary rise in soils
 - (ii) Piping in soils
4. (a) How is optimum moisture content determined in the laboratory for low compactive effort case? 10
- (b) How are soils compacted in field? Discuss briefly. 10

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Unit-III

5. (a) How can we determine the stress distribution below loaded areas? Discuss briefly. 10
- (b) What do you understand by N.C. and O.C. clays? Discuss Casagrande's graphical method of determining the Pre-Consolidation Pressure. 10
6. (a) How can we estimate the value of coefficient of consolidation? Describe square root of Time fitting method. 10
- (b) A saturated clay layer 4 m thick overlies a rock formation and is covered at the top with pervious overburden. In how much time after the application of consolidation pressure, will the clay layer reach half of its ultimate settlement, if the average value of $C_v = 3 \times 10^{-4} \text{ cm}^2/\text{sec}$? 10

Unit-IV

7. (a) Describe Mohr-Coulomb failure criterion for shear strength of soils. 10
- (b) Discuss the various Triaxial shear strength Tests based on Drainage conditions. 10
8. (a) Describe Culmann's method for determining Active Earth Pressure of Frictional Soils. 10
- (b) A wall with smooth vertical back 10 m high supports a purely cohesive soil with $C = 0.6 \text{ kg / cm}^2$ and bulk density = 1.8 g/cm^3 . Draw Rankine's earth pressure diagram and position of zero pressure. 10

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