

[Time: THREE Hours]

[Max. Marks: 80]

“Please check whether you have got the right question paper.”

N.B

- 1) Solve any three questions from each section.
- 2) Assume suitable data if necessary.

SECTION A

- Q.1 a) Obtain the relation between γ_{sat} , G and e(or n), where, e=voids ratio, G= sp. Gravity, γ_{sat} = saturated density, n=porosity. 06
b) Explain the following terms.
i) Thixotropy of soil.(clay) 03
ii) Structural water and adsorbed water. 04
- Q.2 a) Explain the procedure for determination of liquid limit. 06
b) A falling head permeameter accommodates a soil sample 6cm high and 50 cm² in cross-sectional area. The permeability of the sample is expected to be 1×10^{-4} cm/sec . if it is desired that the head in the stand pipe should fall from 30cm to 10cm in 40 minutes. Determine the size of stand pipe which should be used. 07
- Q.3 a) Explain consolidation process with the help of spring analogy 06
b) Explain the various factors which effect the compaction. 07
- Q.4 a) The mass specific gravity of a soil equals 1.56. The specific gravity of solids is 2.45. Determine the voids ratio under the assumption that the soil is perfectly dry. What would be the voids ration, if the sample is assumed to have a water content of 8%? 07
b) Define flow net. What are its applications in isotropic soil? Give the characteristics of flow net. 06
- Q.5 Write short notes on:
i) Square root of time fitting method 04
ii) Textural classification of soil. 04
iii) Proctor needle method for determination of filed water content. 06
- SECTION B
- Q.6 a) Give the general principles of drained. Consolidated un-drained and drain tests. 06
b) Explain with neat sketch contact pressure distribution under rigid footing. 07
- Q.7 a) Obtain an expression for vertical pressure due to a line load. 06
b) Find the intensity of vertical pressure and horizontal shear stress at a point 6.0m directly below a 30KN point load acting at a horizontal ground surface. What will be vertical pressure and shear stress at a point 3m horizontally away from the axis of loading but at the same depth of 6 m? 08
- Q.8 a) Give the classification of slope failures. Enlist the factors contributing to slope failures. 06
b) Explain RanKinels theory of active earth pressure for back fill with uniform surcharge. 07
- Q.9 a) Obtain an expression for earth pressure at rest. 06
b) Explain coulomb's wedge theory of earth pressure. 07
- Q.10 a) Explain stability of downstream slope during steady seepage. 06
b) Explain determination of shear strength By unconfined compression test. 07