

Code No: R32011

R10**Set No. 1**

III B.Tech II Semester Supplementary Examinations, November - 2017
GEOTECHNICAL ENGINEERING –I
(Civil Engineering)

Time: 3 hours**Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

- 1 a) Derive the relationship between dry density and bulk density in terms of water content. [4M]
b) What is meant by relative density of soil? Mention its importance. [4M]
c) Briefly describe the processes of soil formation. [7M]
- 2 a) Explain IS, Unified and HRB soil classification systems. [9M]
b) Define and explain shrinkage limit of soil. Briefly describe the procedure to determine the Shrinkage Limit of a soil. [6M]
- 3 a) Describe clearly with a neat sketch how you will determine the coefficient of permeability of a clay sample in the laboratory and derive the expression used to compute the permeability coefficient. [10M]
b) (i) Why is the capillary rise greater for fine grained soils than for coarse grained soils? [5M]
(ii) What is the effect of temperature of the capillary rise of water in soil?
- 4 a) In a deposit of silty soil, the water table which was at originally at a depth of 1m below ground level was lowered to 3m below ground level. The bulk and saturated unit weight of silty soil was 18kN/m^3 and 20kN/m^3 respectively. What is the change in effective pressure at a depth of 1.0m and 3.0m? [8M]
b) What is quick sand? How to calculate the hydraulic gradient required to create quick sand condition in a sample of sand? [7M]
- 5 a) Derive an expression for a vertical stress below the centre of circular area supporting a uniformly distributed load at the surface. Use Boussinesq's theory [7M]
b) Explain the construction procedure of New mark's chart and its usage. [8M]
- 6 a) Discuss the effect of compaction on soil properties. [7M]
b) What is the mechanism behind compaction of soils? [4M]
c) What are the field compaction equipments? Explain any one. [4M]
- 7 a) Explain Spring Analogy Mechanism for primary consolidation. [5M]
b) Distinguish between normally consolidated and over consolidated soils. [4M]
c) Explain in detail any one method for determining the coefficient of consolidation of a soil. [6M]

