

Code No: V3201

R07**Set No. 1**

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

Time: 3 hours**Max. Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

- 1 a) Write a relationship between void ratio, degree of saturation, unit weight of soil, unit weight of water and specific gravity of soil solids. [8M]
b) A soil has bulk density of 20.1 kN/m^3 and water content of 15%. Calculate the water content if the soil partially dries to a density of 19.4 kN/m^3 and the void ratio remains unchanged. [8M]
- 2 a) Explain soil classification and the principle of soil classification. [8M]
b) Discuss the importance of Atterberg's limits of soil. [8M]
- 3 a) Derive an expression to determine coefficient of permeability of soil by laboratory falling head permeability test. [8M]
b) Explain about the various factors affecting permeability. [8M]
- 4 a) Explain quick sand condition. [8M]
b) Discuss in detail about seepage through soils. [8M]
- 5 a) Derive as per Boussinesq's theory, expression for vertical stress at any point in a soil mass due to strip load. [8M]
b) Two columns A and B are standing 5m apart. Load transferred through them may be taken as point load. Through column A a load of 400kN is acting. Calculate the resultant vertical pressure due to these load on a horizontal plane 2m below the ground surface at points vertically below the column A and B. [8M]
- 6 a) Discuss the effect of compaction on soil properties. [8M]
b) During a compaction test, a soil attains a maximum dry density of 18 kN/m^3 at a water content of 12%. Determine the degree of saturation and percent air voids at maximum dry density. Also find the theoretical maximum dry density corresponding to zero air voids at OMC. The specific gravity of soils 2.67. [8M]
- 7 a) Explain the different e-log p curves for the consolidation. [8M]
b) Distinguish between compaction and consolidation of soils. [8M]
- 8 a) Explain Mohr-coulomb theory of shear strength. Sketch typical strength envelope for soft clay, clean sand and a silty clay. [8M]
b) In an unconfined compression test, a sample of sandy clay 8cm long and 4cm in diameter fails under a load of 120N at 10% strain. Compute the shearing resistance taking into account the effect of change in cross-section of the sample. [8M]
