

Total No. of Questions : 8]

SEAT No. :

P9076

[6179]-201

[Total No. of Pages : 2

S.E. (Civil)

**GEOTECHNICAL ENGINEERING
(2019 Pattern) (Semester - IV) (201008)**

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.*
- 2) *Figures to the right indicate full marks.*

- Q1)** a) Explain Standard Proctor Compaction Test with neat sketch. [6]
- b) A concentrated load of 30 kN acts on the surface of homogenous soil mass of large extent. Find the stress intensity at a depth of 8m and horizontal distance of 2.5 m by using Boussinesq's theory. Compare the value with Westergaard's theory. [6]
- c) Enlist and explain factors affecting compaction. [5]

OR

- Q2)** a) Differentiate between Standard proctor Test and Modified Proctor Test. Draw typical compaction curve for both the tests. [6]
- b) State and explain the terms involved in Boussinesq's point load and circular load equation for vertical stress determination. [6]
- c) Write a note on Proctor needle test with neat sketch. [5]

- Q3)** a) Explain with the help of Mohr circle how shear strength parameters are determined in direct shear test. [6]
- b) Explain the types of triaxial test according to drainage conditions. [6]
- c) A vane 75 mm in diameter and 150 mm in height was pressed into clay in a bore hole. The torque was applied and gradually increased to 50 N.m when failure took place. Determine undrained shear strength. [5]

OR

P.T.O.

- Q4)** a) A soil has an angle of shearing resistance 18° and cohesion of 30 kN/m^2 . If the specimen of this soil is subjected to triaxial compression test, determine the value of cell pressure for failure to occur at a total stress of 300 kN/m^2 . Also calculate deviator stress. [7]
- b) State and explain factors affecting shear strength of cohesive soil. [6]
- c) Define total and effective stresses. [4]

- Q5)** a) In a cohesionless soil deposit having unit weight of 15 kN/m^3 and angle of internal friction 30° . Determine resultant active and passive earth pressure and their positions, if the height of retaining wall is 10 m . [6]
- b) Explain step by step procedure for determination of lateral earth pressure graphically by Rebhann's method with neat sketch. [6]
- c) Discuss how to calculate earth pressure of soil for Backfill with uniform surcharge. [6]

OR

- Q6)** a) Define the various types of earth pressures w.r.t. wall movement with sketches. [6]
- b) Explain step by step procedure for determination of lateral earth pressure graphically by Culmann's method with neat sketch. [6]
- c) A smooth backed vertical wall is 6.3 m high and retains a soil with a bulk unit weight of 18 kNm^3 and angle of internal friction 18° . If the soil surface carries a uniformly distributed load of 5 kN/m^2 . Determine total active earth pressure and its point of application. [6]

- Q7)** a) Explain classification of slopes based on different criteria. [6]
- b) What is Taylor's Stability Number? How it can be used to check the stability of slopes? [6]
- c) Classify the different modes of failure of finite and infinite slope. [6]

OR

- Q8)** a) Write a note on causes and remedial measures of landslide. [6]
- b) Explain 'Swedish Slip Circle' method for stability analysis of finite slope. [6]
- c) Derive the expression for factor of safety for dry infinite slope in sandy soils. [6]

