Code: 15A01603

R15

B.Tech III Year II Semester (R15) Regular Examinations May/June 2018
GEOTECHNICAL ENGINEERING – II
(Civil Engineering)

Time: 3 hours   Max. Marks: 70

PART – A
(Compulsory Question)
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1   Answer the following: (10 X 02 = 20 Marks)
  (a)   What are the purposes of site investigations?
  (b)   What are the factors that affect the sample disturbance?
  (c)   What are different types of slope failures?
  (d)   What is a stability number?
  (e)   What are the factors affecting the magnitude of lateral earth pressure?
  (f)   What are the assumptions in Coulomb's theory?
  (g)   Define 'ultimate bearing capacity'.
  (h)   What is factor controlling the allowable soil pressure for foundation in cohesive soils?
  (i)   What are the conditions where a pile foundation is more suitable than a shallow foundation?
  (j)   What do you understand by grip length?

PART – B
(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2   Explain in detail about plate load test in detail.

OR

3   Describe various methods of drilling holes for sub-surface investigations.

UNIT – II

4   Describe Bishop's simplified method. What are the advantages over Swedish circle method.

OR

5   A dam of homogeneous section is 25 m high with upstream slope of 2.5 to 1.0 and downstream slope of 2 to 1. There is a 12 m long horizontal filter at the downstream end. Taking a free board of 3 m, determine: (i) Factor of safety of downstream slope under steady seepage condition. (ii) Factor of safety of upstream slope under sudden drawdown conditions.

UNIT – III

6   Discuss Culmann's method for the determination of active earth pressure.

OR

7   Determine the passive pressure by Rankine's theory per unit run for a retaining wall 4 m high, with i = 15°, $\phi^|= 30°$ and $\gamma = 19\ KN/m^3$. The backface of the wall is smooth and vertical.

UNIT – IV

8   How would you estimate the settlements of a foundation on cohesion less soils?

OR

9   A strip footing 2 m wide is to be laid at a depth of 4 m in a purely cohesive soil ($C = 150\ KN/m^2$; $\gamma = 19\ kN/m^3$. Determine the ultimate bearing capacity from: (i) Terzaghi's theory. (ii) Skempton's theory.

UNIT – V

10   A group of nine piles, 8 m long, is used for a column. The piles are 30 cm diameter with centre to centre spacing of 90 cm. The subsoil consists of clay with unconfined compression strength of 180 kN/m^2. Estimate the safe load. Take factor of safety as 3.0.

OR

11   Explain the various forces acting on a well foundation.