[Total No. of Questions - 9] [Total No. of Printed Pages - 3]

Dec.-22-0177

CE-503 (Geotechnical Engineering-II)

B.Tech. 5th (CBCS)

Time : 3 Hours **Max. Marks : 60**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all, selecting atleast one question from each Unit. Unit-V is compulsory.

UNIT - I

1. Explain the following:-

   (a) Electrical resistivity method of geophysical exploration.

   (b) Percussion boring. (2×5=10)

2. (a) Discuss the advantage of standard penetration test and its usefulness in foundation design.

   (b) Explain with a neat sketch the construction and use of a split spoon sampler. (2×5=10)

UNIT - II

3. Derive a general expression for active earth pressure by the wedge theory behind a vertical wall due to a cohesionless soil (c - ϕ soil) against a rigid retaining wall. (10)

4. A 9m high retaining wall retains a soil with the following properties: $\varphi = 36°$, γ_d=18 kN/m^3. What will be the increase in horizontal thrust if the soil slopes up from the top of wall at an angle of 36° to the horizontal than when it has a horizontal surface? (10)

UNIT - III

5. (a) Discuss the types of shallow foundations and their design considerations.

   (b) Explain how a foundation may be designed when a dense stratum overlies a loose one. (2×5=10)

6. (a) Discuss the method to determine the bearing capacity in the field. Discuss various advantages and disadvantages.

   (b) Compute the allowable bearing capacity of a strip footing resting on a homogeneous clay deposit at a depth of 1.2m below ground level. The soil parameters are c=40 kN/m^2, $\varphi = 0°$ and the average weight of the soil = 20 kN/m^3. Factor of safety = 3. (2×5=10)

UNIT - IV

7. A square group of nine piles was driven into soft clay extending to a large depth. The diameter and length of pile were 30 cm and 9 m respectively. If the unconfined compressive strength of the clay is 90 kN/m^2 and the pile spacing is 90 cm centre to centre, what is the capacity of the group? Assume a FOS = 2.5 and adhesion factor of 0.75. (10)

8. (a) How does the construction period affect the time-rate of settlement of a structure? What is the effective loading period?

   (b) What is contact pressure? How does it depend on the type of structure and type of soil? (2×5=10)

UNIT - V

9. (a) Explain the principle of seismic refraction.

   (b) Define wash boring.

[P.T.O.]

(c) Discuss undisturbed soil sampling.

(d) Explain passive earth pressure with example.

(e) Discuss the factors affecting types of foundations.

(f) Discuss the principle of plate load test.

(g) Discuss load carrying capacity of pile using dynamic formula.

(h) Discuss group action of piles.

(i) What is active zone in soils?

(j) Discuss the causes of settlement. (10×2=20)