Roll No.						

Total No. of Pages : 02

Total No. of Questions : 09

# B.Voc. (Building Construction and Technology) (Sem.–5) GEOTECHNICAL ENGINEERING Subject Code : BVBCT-504-20 M.Code : 92441 Date of Examination : 04-01-23

Time: 3 Hrs.

Max. Marks : 60

## **INSTRUCTIONS TO CANDIDATES :**

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

#### **SECTION-A**

- 1. Write briefly :
  - a) Discuss merits of Rankine's theory.
  - b) What are the types of shallow foundations?
  - c) Describe various methods of Drilling Holes for subsurface investigations.
  - d) What are different types of earth pressure?
  - e) What is Negative Skin friction? What is its effect on the pile?
  - f) Discuss different methods for the Installations of Piles.
  - g) Describe the split-spoon sampler. What is its use?
  - h) Describe Cone penetration tests.
  - i) Where do you provide a combined footing?
  - j) Discuss various Dynamic formulae.

#### **SECTION-B**

- 2. How would you decide the Depth of Exploration and the lateral extent of the investigations?
- 3. Describe open Excavation methods of Exploration. What are their advantages and disadvantages?
- 4. A retaining wall is 7m high, with its back face smooth and vertical. It retains sand with its surface horizontal.

Using Rankine's theory, determine active earth pressure at the base when the backfill is (a) dry, (b) saturated and (c) submerged, with water table at the surface. Take  $\gamma = 18$  kN/m<sup>3</sup> and  $\phi = 30^{\circ}$ ,  $\gamma_{sat} = 21$  kN/m<sup>3</sup>.

- 5. A 12 m long, 300 mm diameter pile is driven in a uniform deposit of sand ( $\varphi' = 40^\circ$ ). The water table is at a great depth and is not likely to rise. The average unit weight of the sand is 18kN/m<sup>3</sup>. Using Nq = 137, calculate the safe load capacity of the pile with a factor of safety of 2.5.
- 6. How would you fix the Depth of foundation? Discuss Rankine's formula for the minimum depth.

## **SECTION-C**

- 7. Describe various components of settlement in case of shallow foundation. What are the various corrections to be applied to settlement due to consolidation?
- 8. a) How would you estimate the load carrying capacity of a pile in (a) cohesionless soils, (b) Cohesive soils?
  - b) Discuss the uses of penetration tests for the estimation of load-carrying capacity of piles.
- 9. What are the assumptions in Coulomb's theory? Compare Rankine's theory and Coulomb's theory.

# NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.