Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(CE) (2011 Onwards) (Sem.–6)

FOUNDATION ENGINEERING

Subject Code : BTCE-603

Paper ID : [A2290]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION 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

Q1. Answer briefly :

a) A N- value of 35 was obtained for a fine sand below water table. Calculate corrected value of N?

b) Differentiate between SPT and DCPT.

c) Why weep holes are provided in retaining wall?

d) Write difference between Gernal and local shear failure.

e) Draw contact pressure distribution for cohesive soils.

f) Secondary settlement of structures.

g) Define pressure bulb and its significance.

h) Name different types of piles for foundations.

i) Write briefly group action of pile pile.

j) What is scour depth? Give its value as per IS.

SECTION-B

Q2. Explain in detail the rotary drilling technique. State also its advantages over other methods of boring.

Q3. A rectangular footing 2m × 2m exerts a pressure of 150 kN/m^2 on a cohesive soil having Es = 5 × 10^4 kN/m^2 and $\mu = 0.50$. Determine the immediate settlement at center, assuming

a) The footing is flexible (take (I = 1.36)

b) The footing is rigid, take (I =1.06).

Q4. Discuss essential difference between Boussinesq's and Westergarrd's theories.

Q5. A precast concrete pile is driven by a single acting hammer of weight 15kN with a free fall of 900 mm. The final set, the average of the last three blows, is 27.5 mm. Estimate the safe load using Engineering News Record formula (F.O.S = 6).

Q6. Define Open cassion. Give its advantages and disadvantages.

SECTION-C

Q7. a) How the depth of foundation is decided, explain? (5)

b) Write in detail various salient features of bore log. (5)

Q8. Calculate the net safe bearing capacity of a rectangular footing 2m x 4m in plan, founded at a depth of 1.5 m below the ground surface. The load on the footing acts at an angle of 15° to vertical. Saturated unit weight of soil = 18kN/m^3, cohesion = 15kPa, angle of internal friction = 30°. Natural water table is at a depth of 2m below ground surface. Use IS 6403-1981 method. Assume the soil to be fully saturated above water table and factor of safety against shear failure as 2.5. (10)

Q9. a) Design a square pile group to carry 400kN in clay with unconfined compression strength of 60 kN/m^2. The piles are 30 cm diameter and 6 m long. Adhesion factor may be taken as 0.6. Take factor of safety = 3. (6)

b) Mention forces acting on well foundation? (4)