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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

**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) What do you understand by Geophysical method of soil exploration?
- b) Differentiate between SPT and SCPT.
- c) Differentiate between General and local shear failure.
- d) Give BIS method for calculating bearing capacity of foundation.
- e) What are Isobars?
- f) What is Static load carrying capacity of pile? Give its expression also.
- g) What are end bearing and friction piles?
- h) Discuss pile group efficiency briefly.
- i) Define proportioning of raft foundations.
- j) Define Scour depth for a well.

**SECTION-B**

2. Make a Bore hole log sheet for SPT.
3. A soil mass is retained on a smooth backed vertical wall of 6.0 m height. The soil has a bulk unit weight of  $20 \text{ kN/m}^2$  and  $\phi = 16^\circ$ . The top of the soil is level with top of the wall and horizontal. If the soil surface carries a uniformly distributed load of  $4.5 \text{ kN/m}^2$ , determine the total active thrust on wall per meter of wall and its point of application.
4. Calculate the depth at which the vertical stress reduces to 10% of the applied stress in a soil mass below the centre of uniformly loaded area of radius 1.5 m with a pressure of  $60 \text{ kN/m}^2$ .
5. Write note on methods of designing of raft foundations.
6. Explain components of a well with figure.

**SECTION-C**

7. What are Geophysical methods of soil exploration? Explain resistivity method with figure and limitations. (10)
8. a) Discuss plate load test. (6)  
b) In a plate load test using a 305 mm square plate on a sandy soil under a pressure of 150 a settlement of 8mm was recorded; (i) estimate the settlement of 600 mm square plate at same contact pressure, (ii) What should be size of square footing if settlement is to be restricted to 25 mm? (4)
9. a) Design a square pile group to carry 400 kN in clay with unconfined compression strength of  $60 \text{ kN/m}^2$ . The piles are 30 cm diameter and 6 m long. Adhesion factor may be taken as 0.6. Take factor of safety = 3. (7)  
b) What are under-reamed piles and where are these used? (3)