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

Total No. of Questions : 08

PHD (CIVIL)

FOUNDATION DESIGN & CONSTRUCTION

Time : 3 Hrs. Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE questions out of EIGHT question.
2. Each question carry TWENTY marks.
3. Assume missing data, if any.

1. (a) Determine the width of square footing if it has to carry a gross allowable load of 250 kN. The depth of the footing in 1.6 m in a medium dense sand with ϕ = 32°, γ = 18.5 kN per m3 and load is inclined at an angle of 25° to the vertical. Use Meyerhoff's Theory. Take FOS = 3.0, NC = 35.49, Nq = 23.18 & Nr = 30.22. (10)

   (b) Explain in detail about JANBU Method of calculating elastic settlement of foundation in clays. (10)

2. (a) A footing is constructed on sand. Will its bearing capacity remain the same forever or can it change during the life of the footing? (6)

   (b) Explain BIS Method for calculating bearing capacity of soils. (7)

   (c) Explain principal modes of failure of soils. (7)

3. (a) What are the situations suitable for providing pile foundations? How are piles classified? (10)

   (b) Explain Matlock & Reese approach for laterally loaded piles. (10)

4. Four pre cast concrete piles, 500 mm diameter each are driven in a deposit of medium dense sand (ϕ = 32°) to form a square group. This strata extends up to 7.5m depth. The piles are 10m long and 2.5m length of the pile is embedded in dense sand strata (ϕ = 41°). The spacing between the piles in both directions is 2.0m. The water table is close to the ground surface. Estimate the pile group capacity. Design the piles & draw a sketch of designed piles. Show pile cap of piles. (20)

5. Give salient features of the design of :

(a) Pier Cap

(b) Pier

(c) Well Cap

(d) Well Steining

(e) Well Curb

Describe your answer with neat sketches showing typical reinforcement details. (20)

6. (a) Describe with illustrations the difference between Geotextiles and Geomembranes.(12)

(b) Compare the advantages of ascending stage and descending stage grouting. (8)

7. (a) List the factors that have to be considered while selecting an insitu densification technique for loose sand. (10)

(b) Write a note on Vaccum Dewatering. (10)

8. (a) Discuss special measures, you will adopt for foundations constructed under water.(10)

(b) Write a note on 'Shoring and Underpinning–Necessity & Methods' (10)