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

Total No. of Questions : 08

Ph.D in Faculty of Engineering (CE)

FOUNDATION DESIGN & CONSTRUCTION

M.Code : 77367

Time : 3 Hrs. Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE questions out of EIGHT question.
2. Each question carry TWENTY marks.

1. (a) Derive Terzaghi's Formula for bearing capacity of shallow foundations. Show that bearing capacity for clay is independent of the size of the footing. (14)

   (b) How will you proportion footings for equal settlements? (6)

2. (a) Explain the difference in design of a Rectangular combined footing and Trapezoidal combined footing. (10)

   (b) Give step wise procedure for design of Raft Foundation. (10)

3. (a) List the circumstances under which a pile foundation become necessary. (6)

   (b) A group of concrete piles is square in plan and consists of 9 piles each 10 m long and 450 mm diameter. The piles (bored) are installed at a spacing of 1.3 m c/c in a deep clay deposit having an unconfined compressure strength of 65 kN/m2. At the tip of the pile, the undrained shear strength = Cu = 45 kN/m2. Assume average unit weight of soil = 19 kN/m3. Estimate the allowable load on Pile Group. (14)

4. (a) How you would carry out capacity of piles on Rocks ? (10)

   (b) Compare Timber and Concrete piles. Highlight advantages and disadvantages of each. Also illustrate their use w.r.t. type of soil. (10)

5. Determine the required depth of penetration for the cantilever sheet pile shown in Fig. 1 Use Exact Method. (20)

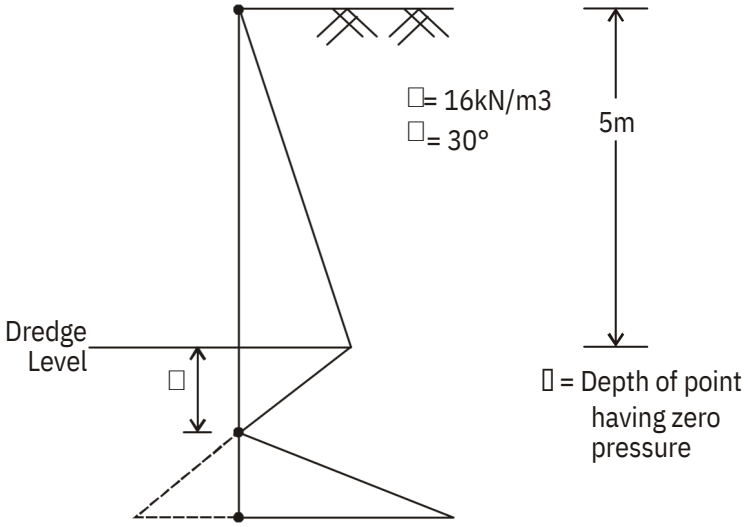

Fig. 1

Assume the missing data, if any.

6. (a) What are Sand Drains? For what purpose, sand drains are employed? (8)

(b) What are Geotextiles? Classify Geotextiles. Give specific applications of Geotextiles. (12)

7. (a) What are the various terms used for describing Degree of compactness. Give importance/application of each in Geotechnical Engineering. (10)

(b) Discuss factors influencing Roller compaction. Give techniques to improve bearing capacity of soils. (10)

8. (a) Discuss principles of design and construction of foundations subjected to earthquake. (14)

(b) Distinguish between SPT and SCPT. (6)

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.