M.Tech(CE) 2nd Semester Examination
June 2014
Advanced Foundation Engineering
Subject Code: CEL-512

Time Allowed: 03 hours.          Maximum Marks: 100

Before answering the question paper the candidate should ensure that they have been supplied the correct question paper. Complaints in this regard, if any, shall not be entertained after the examination.

Note: First question is compulsory. Attempt two questions from each section A and B.

Q.1
(4 x 5)

a) Discuss the various method of site exploration?
b) What is the assumption’s of Terzaghi’s Bearing Capacity theory. Discuss with neat sketch.
c) List out the type of pile based on material used?
d) Name the various types of construction methods for well foundation?

SECTION A

Q.2 Write short notes on the following: (4 X 5)

(a) Penetrometer test.
(b) Pressuremeter test.
(c) Vane Shear Test.
(d) Plate Load test.

Q.3 (2 X 10)

a) Discuss combined footing with neat sketch.
b) What are the advantages and disadvantages of using shallow foundation?

c) Discuss the various method of site exploration?

Q.4 (2 x 10)

a) What are methods to determine the load carrying capacity of a pile?
b) A pile group consisting of four piles is in a square pattern with equal spacing in both the directions. Find the c/c spacing in terms of the diameter of the piles, if efficiency of the group is 75% as per Converse-Labarre formula.

SECTION B

Q.5 (a) Find the group efficiency using Field’s rule for 9 piles in a group. (10)

(b)(i) Explain in brief check for stability for well foundation? (5)

(ii) Explain in brief base pressure in well foundation? (5)

Q.6 (a) Design a cantilever retaining wall to retain a lever earth fill of 4.5m above ground level? Take Angle of repose of soil is 30degree, unit weight of soil= 16KN/m3, coefficient of friction=0.6, bearing capacity of soil=150KN/m3, grade of concrete=M20 and grade of steel=Fe415. Use LSM method. (10)

(b) Design a cantilever retaining wall to retain an earth fill of 3.5m above the basement level? Take Angle of repose of soil is 30degree, unit weight of soil= 16KN/m3, Ysat =12KN/m3, coefficient of friction=0.6, bearing capacity of soil=200KN/m3, grade of concrete=M20 and grade of steel=Fe415. Also consider water table rises 1.5m above the ground level. Use LSM method. (10)

Q.7 (2 x 10)

(a) (i) Explain in brief gravity retaining wall?
(ii) Explain in brief counter fort retaining wall?

(b) Explain earth pressure theory for horizontal and inclined backfill?