R-653

Total No. of Pages : 3

Seat No.	

B.E. (Civil Engineering) (Semester - VII) Examination, December - 2014
ADVANCED FOUNDATION ENGINEERING
(Elective - I)
Sub. Code : 47908

Day and Date : Friday, 12 - 12- 2014 **Total Marks : 100**

Time : 2:30 p.m. to 5.30 p.m.

Instructions :
1) **Question 1 and Q. 5 are compulsory.**
2) **Attempt any other two questions from each section.**
3) **Figure to the right indicates full marks.**
4) **Use of non-programmable calculator and relevant I. S. Codes are allowed.**

SECTION - I

Q1) Write Note on (any three) **[18]**

a) Engineering News and Hiley's formula

b) Friction and end bearing piles.

c) Types of matt foundation.

d) Under reamed piles.

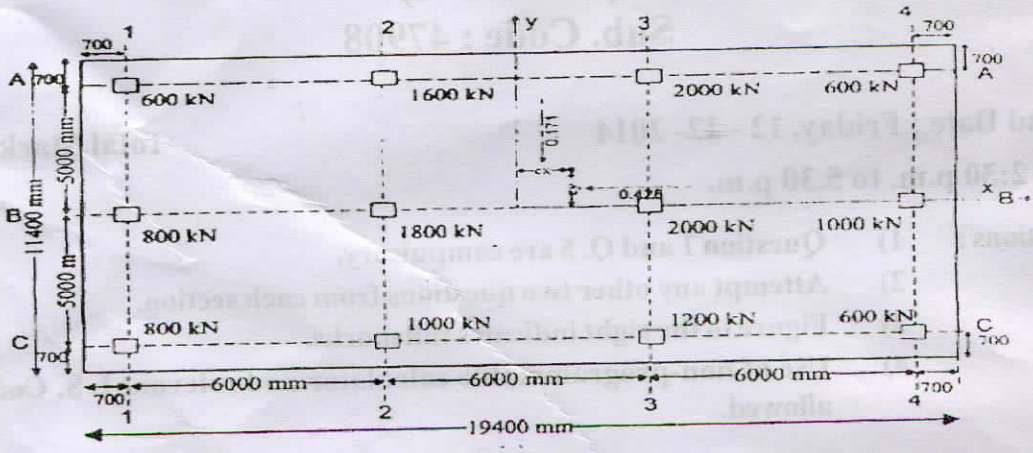
Q2) a) Write detailed design procedure for trapezoidal combine footing? **[8]**

b) Design a combined footing (trapezoidal shape) for two square columns A (400×400mm) and B (500×500mm) respectively carrying axial loads of 900 kN and 1200 kN with a spacing of 4mc/ c with width of footing towards column A as 0.6 times the width of the footing on the side of column B. The property line is at a distance of 0.5m, from the left face of column A. Safe bearing capacity of soil 140kN/m^3. Assume weight of footing and earth above as 10% of the total loads carried by the columns. **[8]**

P.T.O.

Q3) a) Explain in details I.S. Code method of analysis raft foundations? [6]

b) Calculate Soil pressure at different points of a raft foundation for the layout of columns shown in Figure. All columns are of square shape of size 400×400 mm. Safe bearing capacity of soil 80kN/m^3. Assume 10% as the load of raft and soil above. [10]



Q4) a) Classify the pile based on functions, mode of transfer of load and method of installation with neat sketches. [8]

b) A square group of 9 piles was driven into soft clay extending to a large depth. The diameter and length of pile were 300 mm & 10m respectively. If the unconfined compression strength of the clay in 100 KN/m^2 and the pile spacing in 750 mm c/c. What is the capacity of the group? Assume a factor of safety of 3 and adhesion factor of 0.60. Density of soil 20kN/m^3. [8]

SECTION - II

Q5) Write note on (any three) [18]

a) Types and uses of sheet piles.

b) Methods of underpinning.

c) Foundation in expansive soil.

d) Permissible amplitude of vibrations.

Q6) a) List provisions of IS code for the design of foundations for reciprocating machines. **[8]**

b) Assuming resonance to have occurred at a frequency of 20 cycles/sec in a vertical vibration of a test block 1.5 m × 1.0 m × 0.75 m. Determine the value of Cu. The weight of the oscillator is 70 kg and force produced by it after 15cycles is 1000N. Compute the max. Amplitude in the vertical direction at 15 cycles/sec. Weight of test block is 24kN/m^3. **[8]**

Q7) a) Explain in detail the method of design of anchored bulk head by fixed earth method? **[8]**

b) Explain in Single - walled cofferdam and Double-walled cofferdam and when they are used? **[8]**

Q8) a) Explain in detail damage and vibrations due to constructional operations. **[8]**

b) Explain in detail problems associated with the foundation in special soil like Black Cotton soil and Compressible soil. **[8]**

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