Code No. 2024

FACULTY OF ENGINEERING

B.E. IV/IV (Civil) I – Semester (Main) Examination, November/December 2012

Subject: Foundation Engineering

Time: 3 Hours **Max.Marks : 75**

Note: Answer all questions from Part – A. Answer any five questions from Part – B.

PART – A (25 Marks)

1. What are the basic assumptions in Boussinesq's theory of stress distribution in soils?
2. What is the basic principle involved in the development of Newmark's chart?
3. Bring out clearly the effect of ground water table on the safe bearing capacity.
4. What is the difference between immediate settlement, primary consolidation settlement and secondary compression settlement?
5. Using a drop hammer of 20 kN capacity and the height of drop being 4m. The average penetration over the last 5 blows was 10 mm. Determine the allowable load on the pile using Engineering news formula.
6. What are the various components of a well foundation?
7. How the stability of braced system is checked against heaving of the bottom.
8. The following sizes of sampling tubes are available in the market:

O.D., mm	75	110	50
I.D., mm	72	107	35
Length, mm	600	600	600

Out of these which one would you select for obtaining undisturbed soil samples from a borehole?

9. What is a significant depth?
10. Write the allowable amplitudes for different machine foundations.

PART – B (5x10 = 50 Marks)

11.(a) Write a brief critical note on 'the concept of pressure bulb and its use in soil engineering practice.

(b) A rectangular area 4m x 6m carries a uniformly distributed load of 100 kN/m^2 at the ground surface. Estimate the vertical pressure at a depth of 6m vertically below the centre and also below a corner of the loaded area. Compare the results with those obtained by an equivalent point load method and also by dividing the loaded area into four equal parts and treating the load from each as a point load.

12.(a) A 3m x 2m rectangular footing is located at a depth of 5m in a stiff clay of saturated unit weight of 20 kN/m^3. The undrained shear strength of clay at 5m depth is given as 100 kN/m^2. Compute net value of ultimate bearing capacity, with a factor of safety equal to 3. Also determine the maximum load that could be taken by the footing.

(b) Describe plate load test. What are its limitations and uses?

13. Explain in detail how the settlement of footing is estimated embedded in different soils of infinite thickness.

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14.(a) Discuss various dynamic formulae. What are their limitations and validity?

(b) A 16-pile group has to be arranged in the form of a square in soft clay with uniform spacing. Neglecting end-bearing, determine the optimum value of the spacing of the piles in terms of the pile diameter, assuming a shear mobilization factor of 0.7.

15.(a) Discuss the comparative merits and demerits of ‘Open wells’, and ‘Pneumatic caissons’.

(b) Distinguish between “Drainage” and “Filtration” functions of Geotextiles. Give applications based on each function.

16.(a) Enumerate the various methods of soil exploration and mention the circumstances under which each is best suited.

(b) What do you understand by ‘disturbed’ and ‘undisturbed’ samples? What are the sources of sample disturbance?

17. Write short notes on the following:
    (i) Types of machine foundations
    (ii) Pile load test
    (iii) Grouting

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