Register No: …….

B.E. DEGREE EXAMINATIONS: APRIL/MAY2011

Sixth Semester

CIVIL ENGINEERING

U07CE604: Foundation Engineering

Time: Three Hours **Maximum Marks: 100**

Answer ALL Questions:-

PART A (10 x 1 = 10 Marks)

1. The Standard penetration test is useful to measure

   a) Shear strength of soft clays b) Shear strength of sands

   c) Consistency of clays c) None of the above

2. For undisturbed Sample, the area ratios of the samples should be

   a) Zero b) 10% or less c) 10% to 20% d) more than 20%

3. A shallow foundation is usually defined as a foundation which has

   a) Depth less than 0.6 m b) Depth less than its width

   c) Depth less than 1.0 m d) None of the above

4. The permissible settlement is the maximum in case of

   a) Isolated footing on clay b) Raft on clay c) Isolated footing on clay d) Raft on clay

5. Trapezoidal combined footing is required when

   a) the space outside the exterior column is limited b) The exterior column is heavier.

   c) both (a) and (b) d) neither (a) nor (b)

6. For the design of a Strap Footing, the following assumption is not made

   a) The strap is perfectly rigid

   b) The soil pressure varies linearly

   c) The interior footing is centrally located

   d) The strap is not subjected to any direct soil pressure

7. The load- carrying capacity of a pile depends when

   a) Skin friction b) poor resistance c) both (a) and (b) d) neither (a) nor (b)

8. The negative skin friction on a pile develops when

   a) the soil in which it is driven is sandy soil

   b) the soil surrounding it settles more than the pile

   c) the ground water table rises

   d) the soil near the tip is clay

9. The active earth pressure coefficient Ka generally refers to

a) effective stresses b) total stresses c) Neutral stresses d) all the above

10. The material used for manufacture of geotextile is

a) Polythene b) Nylon c) Polyester d) all the above

PART B (10 x 2 = 20 Marks)

11. What do you mean by bore log Report?
12. What are the objectives of soil exploration?
13. Define Bearing Capacity
14. What are the components of settlement?
15. What is contact pressure?
16. Where Mat foundation is used?
17. What are the factors to be considered while selecting the type of pile?
18. What are the methods to determine the load carrying of a pile?
19. Define coefficient of earth pressure.
20. How do you check the stability of retaining wall?

PART C (5 x 14 = 70 Marks)

21. (a) Explain Geophysical Methods of Soil Exploration

(OR)

(b) Explain Standard Penetration Test with Corrections

22. (a) A strip footing of 2 m width is founded at a depth of 4 m below the ground surface. Determine the net ultimate bearing capacity; using (a) Terzaghi's equation (b) Skempton's equation and (c) IS Code. The soil is clay ($\phi = 0$, $c = 10$ kN/ m^2). The unit weight of soil is 20 kN/ m^3

(OR)

(b) A Clay Layer whose settlement under a given loading is expected to be 12 cm, settle 3 cm, at the end of the one month after the application of load increment. How many months will be required to reach a settlement of 6 cm. How much settlement will occur in 10 months? Assume the layer to have double drainage.

23. (a) What are the different types of foundation? Explain

(OR)

(b) Design the rectangular combined footing with two columns carrying the loads of 600 kN and 900 kN. The center to center distance between the columns is 5 m. The size of the columns 0.3x0.3 m.The heavier column is at distance of 1 m from the property line. SBC is 100 kN/ m^2

24. (a) Explain the classification of Piles?

(OR)

(b) A square pile group of 9 piles was driven into soft clay extending to a large depth. The diameter and length of the piles were 30 cm and 9 m respectively. If the unconfined compression strength of the clay is 90 kN/ m^2, and the pile spacing is 90cm center to center, what is the capacity of the group? Assume a factor of safety of 2.5 and adhesion factor of 0.75.

25. (a) Explain Culmann's Graphical Method of Earth Pressure theory.

(OR)

(b) A Gravity Retaining wall retains 12 m of a backfill**,** γ **=17.7** kN/ m^3**,** $\phi = 25^0$ with a uniform horizontal surface. Assume the wall interface to be vertical, determine the magnitude and point of application of total active pressure. If the water table is a height of 6 m, how far do the magnitude and the point of application of active pressure changed?

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