(Pages : 2)

Model Question Paper

Eighth Semester B.Tech. Degree Examination, (2008 Scheme) Branch : Civil

08.806.4 Elective-IV : ADVANCED FOUNDATION ENGINEERING

Time : 3 Hours Max.Marks :100

Instructions: *Answer **all** questions from **Part – A** and **one** question from each Module in **Part – B.***

Use of Brom's chart and Meyerhof's bearing capacity Tables are permitted

PART – A

I. a) Describe skempton;s equation for bearing capacity of cohesive soil

b) Differentiate between Meyerhof's bearing capacity theory and Terzaghi's theory.

c) What is the approximate percentage of reduction of bearing capacity of a footing in pure sand because of submergence ?

d) What are the advantages of Culman's graphical method compared to other methods.

e) Comments on the influence of earthquake forces on the earth pressure for granular soils.

f) List the different types of sheet pile walls with sketches.

g) Differentiate between long piles and short piles.

h) Write the equation for evaluating the lateral load capacity of a vertical pile as given by Brom's method in cohesionless soil

(8 x 5 = 40 Marks)

PART - B

Module I

II. On a cohesive friction soil, a square foundation of 2mx 2m is founded at 1 m depth. The soil has the following properties, Cu = 15.5 kPa , γ_{sat} = 18 kN/m^3, φ_u = 35•. Determine the ne safe load on the footing by Meyerhof's method , if the F.S with respect to shear failure is 23.0.The water table is at a depth of 1.5 m below the ground level.

OR

III. An eccentrically loaded Rectangular footing of size 2.5 m x 3.5 m is placed at a depth of 1 m on a stiff saturated clay. The eccentricity is 0.2 m in each direction. The soil properties are c = 105 kN/m^2 γ = 18 kN/m^3, Compute the net allowable load on the footing if the F.S = 3.0

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Module II

IV. Design a gravity retaining wall 6 m high with vertical back to retain a dry cohesionless backfill of unit weight 20 kN/m^3 and φ = 30•.The wall is to be 1 m wide at the top and 3 m wide at the bottom. The wall is to be constructed of rubble masonry having unit weight of 22 kN/m^3 . Use Rankine's Theory.

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OR

V. A retaining wall , 3.6 m high supports a dry cohesionless backfill with a plane ground surface sloping upwards at a surcharge angle of 10•.The back of the wall is inclined to the vertical at appositive batter angle of 10•. The unit weight of the backfill is 19kN/m^3 and φ = 30•.Assming wall friction of 12•, determine the total active pressure by Rebhban's method ?

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Module III

VI. A cantilever sheet pile of 5 m is embedded in a purely cohesive soil of cohesion 50 kN/m^2 and unit weight 18 kN/m^3 . The wall is subjected to a granular soil pressure having angle of internal friction 30• and unit weight 20 kN/m^3. Compute the depth of embedment of the sheet pile .

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OR

VII. A steel pipe pile of 61 cm outside dia with 2.5 cm wall thickness is driven into saturated cohesive soil up to am depth of 20 m. The undrained cohesive strength of the soil is 85 kPa. Calculate the ultimate lateral resistance of the pile by Brom's method with the load applied at the ground level. The yield strength of pile material is 2800 kg/cm^2.

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