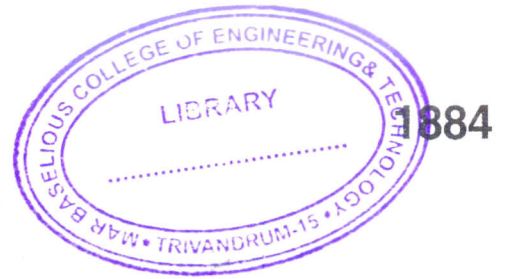




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Reg. No. :

Name :

**Eighth Semester B.Tech. Degree Examination, May 2013
(2008 Scheme)**

08.806.4 : Elective – IV : ADVANCED FOUNDATION ENGINEERING (C)

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) Write down the expression for ultimate bearing capacity given by Meyerhof and explain the terms. What is the modification given for fluctuation of water table position ?
- b) Explain the two methods of modifications given by Meyerhof for evaluating bearing capacity of eccentrically loaded footings.
- c) Explain the principle of Poncelet's graphical solution for evaluating active earth pressure.
- d) What are the advantages of Culmann's graphical method compared to other methods ?
- e) What are the assumptions made in Coulomb's theory of earth pressure ?
- f) Sketch the deflected shape of cantilever sheet pile wall in sandy soil. Also give the simplified pressure diagram.
- g) What are the advantages of steel sheet pile wall over concrete sheet piles ?
- h) Explain with sketches, the methods adopted for improving the ultimate lateral load capacity of piles. **(8×5=40 Marks)**

**PART – B
MODULE – I**

- II. A rectangular footing 2m×3.5m, is placed at a depth of 1.5m below ground surface. Determine by Meyerhof's recommendations, the net safe load that can be supported by the footing with a factor of safety of 2.5 with respect to shear failure. The soil properties are $C' = 20\text{kN/m}^2, \phi' = 22^\circ$.

OR

P.T.O.



- III. Calculate the net ultimate bearing capacity of a square footing $2\text{m} \times 2\text{m}$ in plan founded at a depth of 1.5m below the ground surface. The load on the footing acts at an angle of 10° to the vertical and is eccentric in the direction of width by 10cm . $\gamma_{\text{sat}} = 18\text{kN/m}^3$, $C' = 15\text{kN/m}^2$ and $\phi' = 25^\circ$. Water table is at a depth of 1.5m below the ground surface.

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MODULE – II

- IV. Determine the active thrust on the retaining wall with height 6m , having a vertical back using Culmann's graphical method.

Given $\phi = 35^\circ$, $\gamma = 20\text{kN/m}^3$, $\beta = 90^\circ$ & $\delta = 0$.

OR

- V. A retaining wall, 3.6m high supports a dry cohesionless backfill with a plane ground surface sloping upwards at a surcharge angle of 12° . The back of the wall is inclined to the vertical at a positive batter angle of 10° . The unit weight of the backfill is 19kN/m^3 and $\phi = 32^\circ$. Assuming wall friction of 15° , determine the total passive pressure by Rehmann's method?

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MODULE – III

- VI. A cantilever sheet pile of 6m is embedded in a purely cohesive soil of cohesion 40 kN/m^2 and unit weight 18kN/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.

OR

- VII. a) A concrete pile 900 mm diameter and 6m long is installed in a clay soil with cohesion, 120 kPa (N value 12). Estimate the ultimate lateral resistance if the load is applied at a point situated at 4m above the ground level. Use Brom's Approach.
- b) Compare the behaviour of short piles and long piles in cohesion soil with sketches.

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