



Reg. No. :

Name :

**Seventh Semester B.Tech. Degree Examination, June 2018
(2008 Scheme)
08.705.3 : Elective – III : DEEP FOUNDATIONS (C)**

Time : 3 Hours

Max. Marks : 100

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

PART – A

1. Discuss different methods for the installation of piles.
2. List the methods by which the load carrying capacity of a single pile can be determined. Explain the principle of static formula.
3. Explain the determination of settlement of pile groups in clays.
4. How would you estimate the negative skin friction of pile groups ?
5. Write a note on drilled piers.
6. List the different shapes of cross-sections of well, giving the merits of each.
7. Explain the steps involved in sinking of wells.
8. What are the criteria for determining the grip length of well foundations ? Give specifications. **(8×5=40 Marks)**

PART – B

Module – I

9. a) A 30 cm diameter concrete pile is driven into a homogeneous consolidated clay deposit. Undrained cohesion is 40 kN/m^2 , $\alpha = 0.7$. If the embedded length is 10 m, estimate the safe load, factor of safety = 2.5. **8**

P.T.O.



- b) A precast reinforced concrete pile weighing 30 kN (inclusive of helmet and dolly) is driven by a drop hammer weighing 40 kN and having an effective fall of 0.8 m. The average set per blow is 1.4 cm. The total temporary elastic compression is 1.8 cm. Assuming the coefficient of restitution as 0.25 and a factor of safety of 2, determine the ultimate bearing capacity and the allowable load for the pile.

12

OR

10. Explain with neat sketches the conventional pile load test and cyclic load test.

20

Module – II

11. a) A group of 9 piles with 3 piles in a row was driven into a soft clay extending from ground level to a great depth. The diameter and length of the piles were 30 cm and 10 m respectively. The unconfined compression strength is 70 kPa. If the piles were placed 90 cm c/c, compute the allowable load on the pile group on the basis of a shear failure criterion for a factor of safety of 2.5.
- b) Explain Skempton's and Meyerhof's methods for determination of settlement of pile groups in sands.

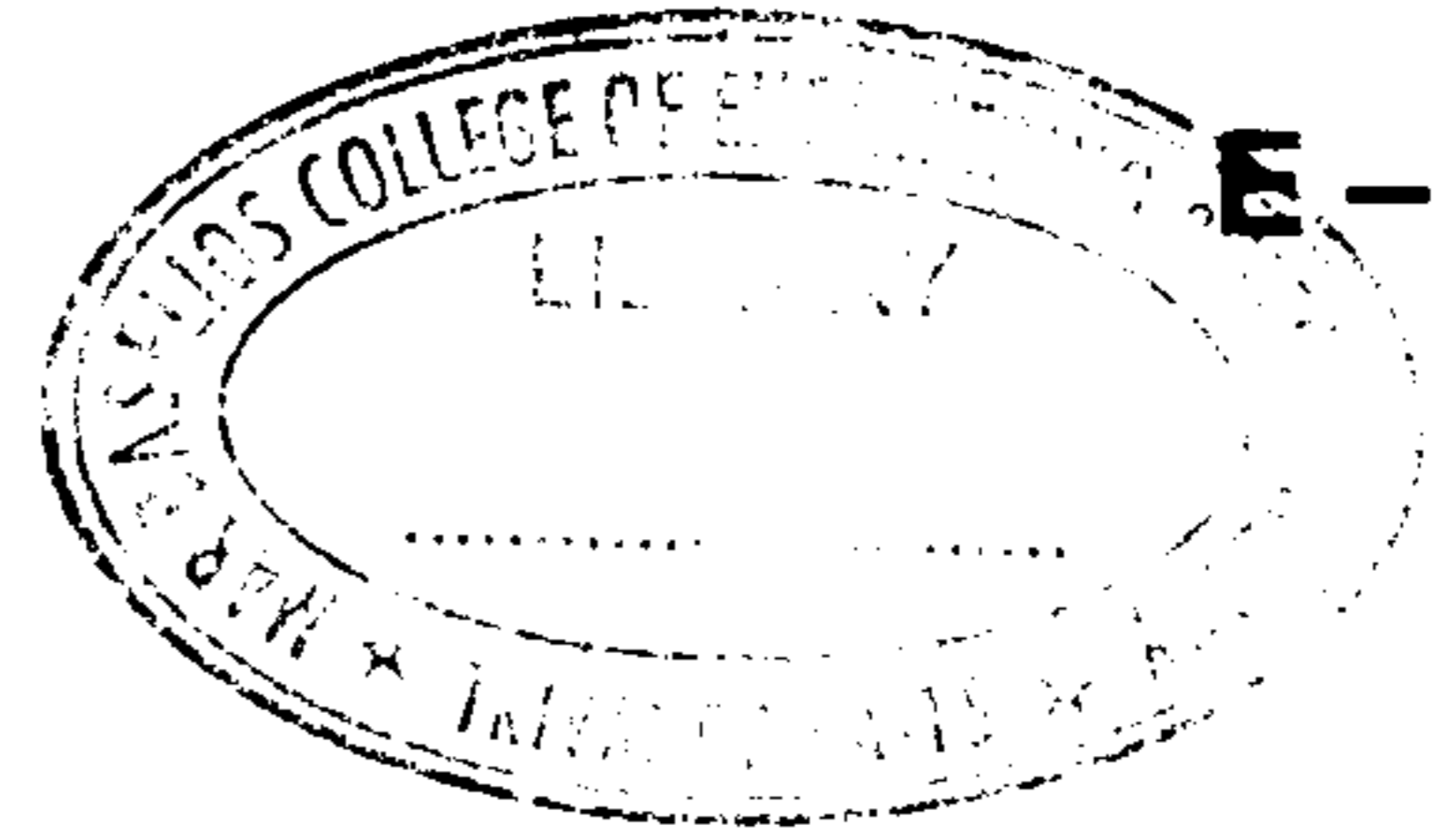
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8

OR

12. Estimate the load carrying capacity of drilled pier whose shaft is 100 cm diameter for a length of 8 m. The diameter is belled to 250 cm in a length of 4 m at the bottom. The top 10 m of the pier passes through submerged soft clay ($\gamma_{\text{sat}} = 18 \text{ kN/m}^3$) with cohesion 20 kPa. The pier rests on dense sandy gravel with an angle of friction of 38° . The values of N_c , N_q and N_γ for 38° are 75, 80 and 50 respectively, $\alpha = 0.8$. What the assumptions used in the computation ?

20



Module – III

13. A circular well has an external diameter of 7.5 m and is sunk into a sandy soil to a depth of 20 m below the maximum scour level. The resultant horizontal force is 1800 kN. The well is subjected to a moment of 36,000 kNm about the maximum scour level due to the lateral force. Determine whether the well is safe against lateral forces assuming the well to rotate
- a) about a point above the base and
 - b) about the base. Assume $\gamma' = 10 \text{ kN/m}^3$ and $\phi = 36^\circ$. Use Terzaghi's analysis and a factor of safety of 2 against passive resistance. 20

OR

14. a) Derive an expression for the minimum steining thickness of a well foundation for sinking with its own weight. 10
- b) What are the problems encountered in well sinking ? How are they minimized ? 10
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