Roll No.

Total No. of Pages : 02

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M.Tech. (Civil / Soil Mechanics & Foundation Engineering) / (Geo Technical Engineering) / (Sem.–1) ADVANCED FOUNDATION ENGINEERING

Subject Code : CESE-2

M.Code: 37208

Date of Examination: 10-01-2023

Time: 3 Hrs.

Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

- 1. Attempt any FIVE questions out of EIGHT question.
- 2. Each question carries TWENTY marks.
- 1. a) Explain the concept of useful width for determination of load carrying capacity of eccentrically loaded footing.
 - b) What are the factors which affect the bearing capacity of a shallow footing? Explain in detil.
- 2. a) The 'dynamic formulas' used for calculating load carrying capacity of piles give exact results. Explain critically this statement with logic.
 - b) A concrete pile 30 cm square in section is driven 15 m into dense sand. The pile is 1.6 m above the ground level and is subjected to a lateral thrust of 60 kN at the top. Determine the lateral deflection of the pile at 1.6 m below the ground level. The water table is close to the ground surface and the pile top is fully restrained.
- 3. a) A square group of 9 piles was driven into soft clay extending to a large depth. The diameter and length of pile are 0.3 m and 9.15 m respectively. If the unconfined compressive strength of the clay is 87 kN/m² and pile spacing is 0.9 m centre to centre, what is the capacity of the pile group? Assume factor of safety as 2.6 and adhesion factor of 0.75.
 - b) Discuss in brief the design of a batter pile foundation beneath a retaining wall.
- 4. a) Compare well foundation with pile foundation. Which one will you prefer in case of foundations in flowing river and why?
 - b) Describe the forces for which a well foundation is required to be designed.

- 5. a) Discuss the two broad approaches in the design of machine foundation .
 - b) Briefly explain PAUW'S ANALOGY of machine foundation design.
- 6. a) Discuss with sketches different types of coffer dams.
 - b) Define the coefficient of subgrade reaction. How is it found? Discuss the various factors affecting its values.
- 7. a) A square footing 3 m by 3 m carries a udl of 310 kN/m². Determine the intensity of vertical pressure at a depth of 5 m below a point 0.75 m inside each of the two adjacent sides of the footing. Use Boussinesq and Westergaards analysis and compare the values.
 - b) Draw a labeled sketch of a well foundation showing its essential components. Explain the function of any three components.

8. Write short notes on the following:

- a) Instability of heave of bottom
- b) Modification by Anderson and Techabotarioff.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.