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# B.Tech (Civil) (Sem.–7) FOUNDATION ENGINEERING Subject Code : CE-412 Paper ID : [A0629]

Time: 3 Hrs.

Max. Marks: 60

## INSTRUCTIONS TO CANDIDATES :

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

# **SECTION-A**

#### Q1. Answer briefly :

- a) What are the various forces acting on well foundation?
- b) What is negative skin friction? How is it calculated?
- c) What are the limitations of pile driving formulae?
- d) Differentiate between shallow and deep foundations.
- e) What criterions should a foundation satisfy for a satisfactory performance?
- f) Mention the degrees of freedom of block foundation.
- g) Give values of permissible amplitudes for rotary type machines.
- h) What information is available from the borehole log?
- i) What do you mean by the term 'significant depth of exploration'?
- j) How will you determine pile capacity based on Engineering News Formula?



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## **SECTION-B**

- Q2. Discuss the stability analysis of wells in cohesionless soils.
- Q3. Discuss pile load tests in detail.
- Q4. Explain with neat sketches various types of machine foundations.
- Q5. What are the various methods of boring? Discuss.
- Q6. Proportion a square footing to carry a load of 150t from a column. The depth of foundation is to be kept at 2m below ground surface. Maximum permissible settlement of the footing is 40mm and a factor of safety of 3 is required against shear failure. The subsoil is sand with an average corrected N value of 18 as established from borings. Water table is at a large depth. Use teng's correlations.

# **SECTION-C**

- Q7. Discuss various Geophysical methods of soil exploration in detail.
- Q8. A 300mm diameter concrete pile, 10m long, was driven by a McKiernan and Terry double acting hammer (rated energy 16.62 kJ, total mass 2200kg). The driving was done with a short dolly and cusion 2.50m. The average penetration recorded in the last five blows was 3.0mm/blow. Calculate the safe pile load.
- Q9. What are the various methods used for in situ determination of dynamic properties of soil?