



## GOVERNMENT COLLEGE OF ENGINEERING, JALGAON

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Name of Examination : **Summer 2021** - (Preview)

Course Code & Course Name : **CE353 - Foundation Engineering**

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Maximum Marks : **60**

Duration : **3 Hrs**

[Edit](#) [Print](#) [View Answer Key](#) [Close](#) **Answer Key Submission Type:** Marking scheme with model answers and solutions of numerical

Instructions:

1. All questions are compulsory.
2. Illustrate your answer with suitable figures/sketches wherever necessary.
3. Assume suitable additional data; if required.
4. Use of logarithmic table, drawing instruments and non programmable calculators is allowed.
5. Figures to the right indicate full marks.

- 1) a)** Solve any two [08]
- i. What are the objectives of soil investigation?
  - ii. Explain any one Geophysical method commonly used for Civil Engineering purpose
  - iii. Write short note on bore log report with neat sketch.
- b)** A square foot of 2.5m width is constructed at a depth of 1.2 m below the ground level in a cohesive soil deposit having a bulk unit weight of 16.5 KN/m<sup>3</sup> and an unconfined compressive strength of 55kpa. Determine the ultimate and safe bearing capacity of the footing for a factor of 3 using Terzaghi's equation. The bearing capacity factor for  $\phi=0^\circ$  are  $N_c = 5.7$ ,  $N_q = 1$ , and  $N_\gamma = 0$  [06]
- 2) a)** Solve any two [08]
- i. Draw Terzaghi's bearing capacity failure surface with all details..
  - ii. What are the limitations of plate load test?
  - iii. Describe types of foundations and discuss selection criteria of foundation.
- b)** A square concrete pile (30 m side) 10 m long is driven into coarse sand ( $\gamma = 18.5$  KN/m<sup>3</sup>,  $N = 20$ ). Determine the allowable load (FS = 3.0) [06]
- 3) a)** Solve any two [08]
- i. Enlist the causes of differential settlement and explain how to minimize it.
  - ii. Explain floating foundation
  - iii. What are the factors affecting depth of footing?
- b)** In a test block of size 1.5m x 1.0m x 0.75m, resonance occurs at a frequency of 20 cycles per second in the vertical vibration, Determine the coefficient of elastic uniform compression ( $C_u$ ) if the mass of oscillator is 70kg and the force produced by it at 15 cycles per second is 1000N. Also compute the maximum amplitude at 15 cycles per second [06]
- 4) a)** What is meant by under-reamed pile? When and where they are used? Why? [05]
- b)** Explain Barkens method of design of machine foundation. [04]
- c)** Describe the various components of pneumatic caisson with the help of sketch. [05]
- d)** What is single degree of freedom system? Draw a neat sketch of such a system that can undergo displacement in the horizontal direction. [04]

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