

Total No. of Pages 1

Roll No.

EIGHTH SEMESTER

B.E. (CE)

MID SEM EXAMINATION

March 2006

CE-411 ADVANCED GEOTECHNICAL ENGINEERING

Time: 1 Hour 30 Minutes

Max. Marks : 20

Note : Answer **ALL** questions.
Assume suitable missing data, if any.

1. Explain, what do you understand by sensitive clays. Explain possible causes of sensitivity in clays. 4
2. Explain, how Loessic soils are formed in nature. Describe the characteristics of loessic soils. 4
3. What are expansive soils? How they can be identified, and explain the factors responsible for such behaviour. 4
4. What do you understand by subsurface soundings? Differentiate between the methodologies of various methods of soundings. Describe the equipments used in each method of sounding, giving neat sketches. 4
5. Describe the operation, equipment, and theory of field vane shear test. What are the specific advantages of vane shear test. 4

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MID SEM EXAMINATION

March 2006

CE-412 EARTHQUAKE TECHNOLOGY

Time: 1 Hour 30 Minutes

Max. Marks : 20

Note : Answer **ALL** questions.

Give neat sketches in support to your answer if necessary.

Assume suitable missing data, if any.

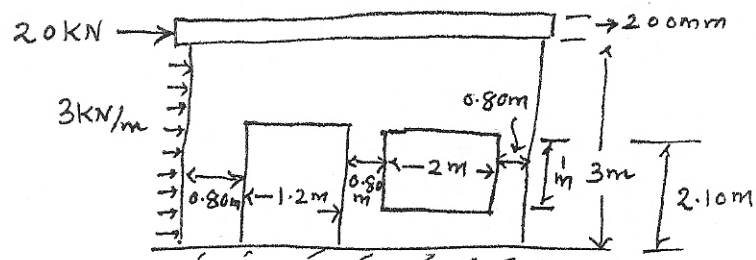
- 1 Define following terms
 - (i) Richter's Magnitude
 - (ii) Moment Magnitude
 - (iii) Focus, Epicentre, focal depth, focal distance and epicentral distance.

3
- 2 Discuss the difference between Magnitude and intensity. Discuss in detail the impact of earthquake for MSK intensity VII, VIII and IX on buildings only. What is the probable intensity in Delhi and in Chennai.

5
- 3[a] Discuss in detail Pier method of analysis to find stresses in walls of masonry buildings due to lateral loads. Derive relevant expression?

4
- [b] Using above expression find stresses due to over turning only in piers of 23 cm thick wall shown in Fig.1 The lateral loads are given as shown.

2



- 4[a] Explain the terms Response Spectra. 2
- [b] Find time period of the RC Framed Building with brick infills in transverse direction only if building plan dimensions are $40\text{m} \times 18\text{m}$ and height of this 10 storey building is 36 metre. Lumped weight on each floor and roof is 9500 kN. For above period find base shear as per IS 1893, if $Z = 0.36$. Assume I & R giving reasons. Response spectra to be used is given in Fig.2. 4

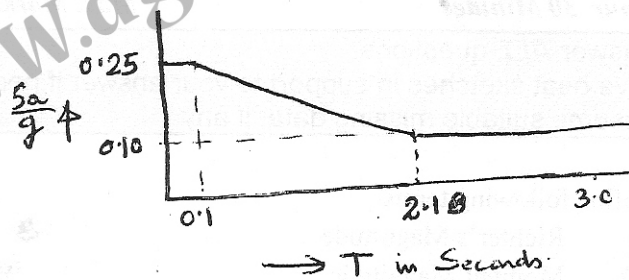


Fig 2. Response Spectra

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2006

CE-413 DESIGN OF PRESTRESSED CONCRETE AND TIMBER STRUCTURES

Time: 1 Hour 30 Minutes

Max. Marks : 20

Note : Answer **ALL** questions.

Assume suitable missing data, if any.

Use of IS 1343-1980 is not permitted.

- 1 A simply supported prestressed concrete beam, of rectangular cross section 400 mm x 600 mm depth, is loaded with a total uniformly distributed load of 256 kN over a span of 6 m. the eccentricity of tendons, which are straight, is 100 mm above and 100 mm below the centroidal axis at the supports and mid span respectively. Determine the stresses at the top and bottom fibres at the mid span of the beam. The density of concrete is 25 kN/m³. A total prestressing force of 1920 kN is applied in tendons. 5
- 2 Describe Freyssinet system of anchoring tendons in post-tensioned construction. Draw a neat sketch. 2
- 3 Discuss the loss of prestress due to relaxation of steel. How this loss is calculated as per IS 1343-1980? 2
- 4 A prestressed concrete beam has the following details.
 - i. Size 250 mm x 250 mm
 - ii. 60 tendons of 2 mm diameter each provided uniformly over the cross section.
 - iii. Total prestressing Force = 300 kN.

- iv. $E_s = 210 \text{ KN/mm}^2$
- v. $E_c = 32 \text{ KN/mm}^2$
- vi. Shortening due to creep = $30 \times 10^{-6} \text{ mm/mm per N/mm}^2$ of stress
- vii. Total shrinkage = 200×10^{-6} per unit length
- viii. Relaxation of steel = twice the loss due to shrinkage.

Calculate the loss of prestress considering the above parameters. 5

5 What is meant by stress corrosion of tendons? What may be the after-effects of it in prestressed concrete structures? 2

6 Determine the final prestress value in tendons in question 4 above. 2

7 Determine the deflection at mid span location in question 1, above, due to self weight, imposed load and prestress. 2