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Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 08

M.Tech.(Civil Engg.) (2016 Batch) (Sem.–2)

EARTHQUAKE ENGINEERING

Subject Code : MTCE-207

Paper ID : [74300]

Time : 3 Hrs. Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. **Attempt any FIVE questions out of EIGHT questions.**
2. **Each question carries TWENTY marks.**

Q1 a) Distinguish between magnitude and intensity of an earthquake. Explain with the help of analogy. (10)

b) The response of a block foundation exited by an oscillator was noted as 20 cps. The amplitude of vibration at resonance was 1mm. The dynamic force oscillator at 20 cps is 7 kN. If the total weight of the block and the oscillator is 21 kN, what is the value of damping factor? (10)

Q2 a) A vibrating system is defined by the following parameters :

$$M = 3 \text{ kg}, k = 100 \text{ N/m}, c = 3 \text{ N-sec/m}$$

Determine damped frequency of vibration and logarithmic decrement. (8)

b) Differentiate between Seismogram and Seismograph. (4)

c) Draw a typical graph of Transmissibility versus Frequency ratio for vibration isolation. (8)

Q3 a) Write a note on '*Effect of local conditions on ground motion*'. (10)

b) As an Engineer, you are to determine elastic and shear modulus of soil at a certain site. Describe the various tests for determining these parameters. (10)

Q4 a) What are the main characteristics of a reciprocating machine and a rotary machine? (10)

b) Discuss the application of Lumped Parameter Solution with the aid of example. (10)

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Q5 a) Differentiate between Allowable ductility demand versus Ductility capacity. (8)

b) What is liquefaction of soil? How liquefaction analysis is performed? What is its importance? (12)

Q6 a) How do the retaining walls behave during earthquakes? What steps should be taken to avoid failure of retaining walls during earthquakes? (10)

b) '*Slope stability is very important especially during earthquakes*'. How you are going to counteract with this problem? Explain any one method for stability analysis of slopes. (10)

Q7 '*Mitigation is of paramount importance*'. Discuss in detail, the various techniques, you will adopt, for earthquakes. (20)

Q8 Write short notes on :

a) Vibration Isolation.

b) Characterization of ground motion. (20)

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