Roll No. | | | | | | | | | | | | |  Total No. of Pages : 01

Total No. of Questions : 08

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

# SOIL DYNAMICS

Subject Code : MTCE-214

Paper ID : [74307]

Time : 3 Hrs. Max. Marks : 100

**INSTRUCTION TO CANDIDATES :**

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

Q1. a) The response of a block foundation exited by an oscillator was noted as 22 cps. The amplitude of vibration at resonance was 1mm. The dynamic force oscillator at 22 cps is 7 kN. If the total weight of the block and the oscillator is 21 kN, what is the value of damping factor? (8)

b) 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. (12)

Q2. a) Discuss theories for foundations on elastic half space. (12)

b) Differentiate between critical damping and under-damping in detail. (8)

Q3. a) You have encountered a site where liquefaction of soil has taken place. How you will assess zone of liquefaction? Explain in detail. (12)

b) Explain 'Cross hole shear test' (8)

Q4. As a Geotechnical Engineer, you are to determine elastic and shear modulus of soil at a certain site. Describe the various dynamic tests for determining these parameters. (20)

Q5. a) Differentiate between Active and Passive isolation. (8)

b) Write in brief about nature of Dynamic loads. (12)

Q6. What is Cyclic shear test? How is it performed? What is the output, we get from Cyclic shear test? (20)

Q7. Consider forced vibration and formulate equation for forced vibration using spring dash pot model. Also establish solution of the same. (20)

Q8. a) Derive the expression for the dynamic response of a simply supported beam subjected to uniformly distributed load throughout the span. (12)

b) Define the following :

i) Time period of vibration,

ii) Damping coefficient. (8)