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

Total No. of Questions : 08

M.Tech. (Soil Mechanics & Foundation Engineering) (Sem.–3)

SOIL DYNAMICS

Subject Code :CESE-3

M.Code : 37211

Date of Examination : 16-12-22

Time : 3 Hrs. **Max. Marks: 100**

INSTRUCTIONS TO CANDIDATES :

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

1. a) 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?

   b) A vibrating system is defined by the following parameters :

   M = 3 kg, k = 100 N/m, c = 3 N-sec/m

   Determine damped frequency of vibration and logarithmic decrement.

2. What is Culmann Graphical Method? Discuss in detail about application of Modified Culmann Construction. Illustrate your answer with an example.

3. Discuss the bearing capacity criteria for satisfactory action of a footing. Explain in detail ''*computation of earthquake loads*'' for footings.

4. a) Explain the terms '*Liquefaction*' and '*Cyclic mobility*'.

   b) The sand deposit of fine sand of finite thickness is located at a depth of 2.9 m from ground surface. Sand deposit is located in zone IV. The corrected value of SPT is eight.

   Taking Υ_{soil} = 16.8 kN/m^3 and Υ_{sub} = 9.2 kN/m^3, compute the factor of safety against liquefaction for saturated sand located at a depth of 2.9 m.

5. a) Discuss about the degree of freedom of the model used in the dynamic analysis of hammer foundation with elastic pad.

   b) Discuss ''*Screening of waves*''.

6. Discuss a method in detail to analyze a Reciprocating type of machine.

7. 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.

8. Write short notes on :

a) Stress conditions on soil elements under earthquake loading

b) Vibration Isolation and its importance.

NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.