2. A machine foundation weighs 60 KN. The spring constant is 11000 KN/m. and dash pot constant (C) = 200 KN-s/m. Explain :

   (i) Whether the system is over damped, under tamped or critically damped.

   (ii) Determine Logarithmic decrement

   (iii) Determine Ratio of two successive amplitudes

   (iv) Determine If the initial displacement is 10 mm and initial velocity is zero displacement at t = 0.1 s 20

3. Assess the equation of motion for a damped two degree of freedom system. 20

4. A three spring mass system is shown on figure. All the masses are subjected to dynamic forces. Develop the equation of motion in terms of displacements x_1, x_2, x_3 of the masses along the axis of the springs. 20

5. (a) How will you estimate the measurement of earthquakes using i. Seismograph ii. Seismogram with neat sketches. 10

   (b) Discuss about the vertical irregularities that affect the performance of RC buildings during earthquake. 10

6. Write the step by step procedure for seismic analysis of RC buildings as per IS 1893 : 2002. 20

7. Explain mechanism of base Isolation Technique. 20

8. Derive the expression for Orthogonality and Normality Principles. 20

Roll No. .....

23381

M. Tech. 2nd Semester (Civil Engg.) (Specialisation in Structural Engg.) (Elective-II) Examination – June, 2023

STRUCTURAL DYNAMICS AND EARTHQUAKE ENGG.

Paper : CE-610

Time : Three Hours] *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions. All questions carry equal marks.

1. (a) Elaborate undamped system with an example. 5

   (b) A mass of 2 kg is suspended by a spring having a stiffness at 700 N/m. The mass is displaced downward from its equilibrium position by a distance of 0.02 m. Estimate equation of motion, normal frequency, the response of the system and total energy. 15