BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)

CLASS: BE **SEMESTER: VII**
BRANCH: CIVIL **SESSION : MO/2018**

SUBJECT : CE7001 EARTHQUAKE RESISTANT DESIGN

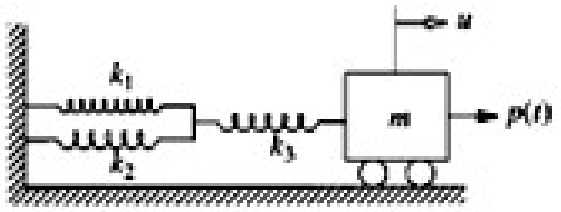
TIME: 1.5 HOURS **FULL MARKS: 25**

INSTRUCTIONS:
1. The total marks of the questions are 30.
2. Candidates may attempt for all 30 marks.
3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. The missing data, if any, may be assumed suitably.

Q1 (a) What is earthquake? [2]
(b) Explain the properties of P, R and S waves. [3]

Q2 (a) What is the difference between the magnitude and intensity of earthquakes? [2]
(b) Explain the following terms: Epicenter, hypocenter and focus of earthquake. [3]

Q3 (a) Explain the D'Alembert's principles. [2]
(b) Write down the dynamic equation of motion for structures shown below and draw free body diagram. [3]



Q4 (a) For a system with the damping ratio ζ, determine the number of free vibration cycle required to reduce the displacement amplitude to 10% of the initial amplitude; the initial velocity is zero. [2]
(b) Find the solution of dynamic equation of motion for damped system subjected to harmonic force. [3]

Q5 Write down the steps involved to determine the response of damped system by using central difference method. [5]

Q6 An SDF System has the following properties: m = 10 kg, k = 40 N/m and ζ = 0.05. Determine the response u(t) of this system to p(t) defined by linear force varying from 20 N to zero in 4 sec by the Newmark's average acceleration method using Δt = 0.1 sec. [5]

:::: 10/09/2018 M ::::::