Reg. No. : | | | | | | | | | | |

Question Paper Code: 57103

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Seventh Semester

Civil Engineering

15UCE703-STRUCTRUAL DYNAMICS AND EARTHQUAKE ENGINEERING

(IS 13920:1993, IS 4326:1993 and IS 1893(Part 1):2002 are permitted)

(Regulation 2015)

Duration: One hour Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. In which situation the resonance will occur …….. CO1- R

   (a) $\omega = \omega_n$ (b) $\omega > \omega_n$ (c) $\omega < \omega_n$ (d) $\omega \neq \omega_n$

2. The particles of the body move perpendicular to the axis, the vibration created are known as …… CO1- R

   (a) longitudinal (b) transverse (c) torsional (d) none of these

3. Characteristic vector is also known as CO2- R

   (a) Modal vectors (b) Eigen values (c) Modal values (d) Shape vector

4. Shear building is defined as …….. CO2- R

   (a) Rotation (b) No rotation (c) Translation (d) No translation

5. The point of origin of an earthquake below the surface of the earth is called CO3- R

   (a) Epicentre (b) Hypocentre (c) Isoseists (d) Focal depth

6. ---------- are the instruments used to record the motion of the ground during an earthquake CO3- R

   (a) Seismograph (b) Seismogram (c) Seismology (d) None of the these

7. Which codal provisions used for ductile detailing for reinforced concrete structures CO4- R

   (a) IS456:2002 (b) IS13920:1993 (c) IS1893 :2000 (d) IS4326:1993

8. The graph showing the variation of the maximum response with natural frequency to a specified forcing function is known as — CO4- R

(a) Response spectrum (b) bauschinger

(c) Peak ground acceleration (d) seismogram

9. The tension steel ratio on any face, at any section, shall not be less than — CO5- R

(a) 0.24 (b) 0.22 (c) 0.23 (d) 0.21

10. For an ideal Rigid building, Time Period is — CO5- R

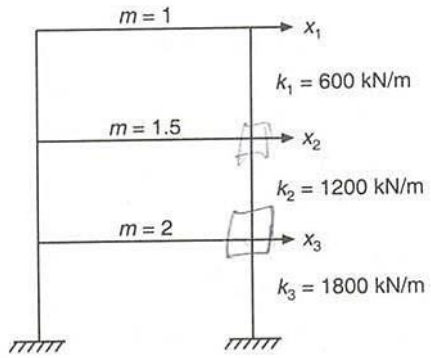
(a) Equal to zero (b) Less than zero (c) Greater than zero (d) Greater than 1

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. A vibrating system consists of a mass of 5kg, spring of stiffness 120 N/m and a damper with a damping co-efficient of 5 N/s/m. determine a. Damping factor b. Natural frequency of the system c. Logarithmic decrement d. The ratio of two successive amplitude e. The number of cycles after which the initial amplitude reduces to 25%.. — CO1-App — (8)

12. Calculate the natural frequency and draw the mode shape for the shear building shown in fig. — CO2- App — (8)



13. What is Fault? Explain the different types of faults with neat sketches. — CO3-U — (8)

14. Explain in detail about Effects of Earthquake in different types of structures — CO4-U — (8)

15. List out the codal provisions for architectural considerations and structural design considerations as per IS 4326:1993. — CO5- U — (8)