22242

M. Tech. 3rd Semester Mechanical Engg. (Machine Design) Examination– December, 2016

MECHANICAL VIBRATIONS

Paper : M-823-A

Time : 3 hours   *Max. 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 the examination.

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

1. Explain single degree freedom system with suitable example. (20)

2. What is system identification from frequency response. Explain how is it important for the system analysis (20)

3. Using Matrix Inversion Method, find the natural frequency of simple multi degree or freedom system with mass (M) and stiffness (K). (20)

4. Discuss the vibration of strings and rods in the continuous system. (20)

5. Explain the various tests on free and forced vibration with examples. (20)

6. Determine the equation for natural frequencies of a string in longitudinal vibration. (20)

7. Split the harmonic motion $x = 10\sin(\omega t + \pi/6)$ into two harmonic motions one having a phase angle of zero and other of 45°. (20)

8. Write short notes on : (20)

(a) Free Vibration

(b) Whirling of Rotating Shafts

(c) Undamped vibration.