UNIT – IV

8. Derive a suitable expression for longitudinal vibrations for a rectangular uniform cross-section bar of length 'L' fixed at one end and free at the other end. 15

9. Define noise and its characteristics. What are the common sources of noise. Explain various noise control methodologies. 15

Roll No. _____

3613

B. Tech. 7th Semester (ME) PEC-III Examination – February, 2022

NOISE AND VIBRATIONS

Paper : PEC-ME-409-G

Time : Three Hours] *[Maximum Marks : 75*

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 in all selecting *one* from each Unit. Question No. 1 is ***compulsory***. All questions carry equal marks.

1. Explain the following : 2.5 × 6 = 15

   (a) D' Alemberts Principal

   (b) Vibration Isolation

   (c) Vibration Damper

   (d) Multi-degree of freedom

P. T. O.

(e) Noise level measurement techniques

(f) Influence Coefficients

UNIT – I

2. Add the following vector analytically and check the solution graphically : 15

$X_1 = 14 \sin(\omega t + 10^\circ)$

$X_2 = 16 \cos(\omega t + 60^\circ)$

3. The disc of a torsional pendulum has a moment of inertia of 600 kg-cm² and is immersed in a viscous fluid. The brass shaft attached to it is of 10 cm diameter and 40 cm long. When the pendulum is vibrating, the observed amplitudes on the same side of the rest position for successive cycles are 9 degree, 6 degree, 4 degree Determine (i) logarithmic decrement (ii) damping torque at unit velocity (iii) the periodic time of vibration. Assume for the brass shaft $G = 4.5 * 10^5$ kg/cm². What would be the frequency if disc is removed from the viscous fluid ? 15

UNIT – II

4. Write short note on : 15

(a) Runge-Kutta Method

(b) Vibration Measuring Instruments

(c) Sharpness of Resonance

5. Drive equation for forced vibrations due to excitation of support and also find energy Dissipated when system undergoes to steady state with viscous damping. 15

UNIT – III

6. Drive the equation to find out solution for two degree of freedom system under viscous damping. 15

7. Find the natural frequency of vibrations by considering multi rotor vibration system using Holzer method. 15