

Seat No. **MAR_APR 2025 SUMMER EXAMINATION****11731 Bachelor of Technology (NEP-2.0)****Sub. Name: Noise and Vibration****Sub. Code: 68510/84845/84952**

Day and Date: MAY ,21-05-2025

Total Marks: 70

Time: 10:30 AM To 01:00 PM

- Instructions:**
1. All questions are compulsory
 2. Assume suitable data wherever necessary and mention it boldly
 3. Draw neat labelled diagrams wherever necessary
 4. Figures to the right indicate full marks
 5. Use of Scientific calculator is allowed

Q1)

[12]

a)

06 Marks

Explain the different causes of vibration in machine.

OR

Explain the different types of vibration.

b)

06 Marks

Find the natural frequency of the system as shown in fig. 1.b. Neglect the mass of pulleys and assume the cord is inextensible.

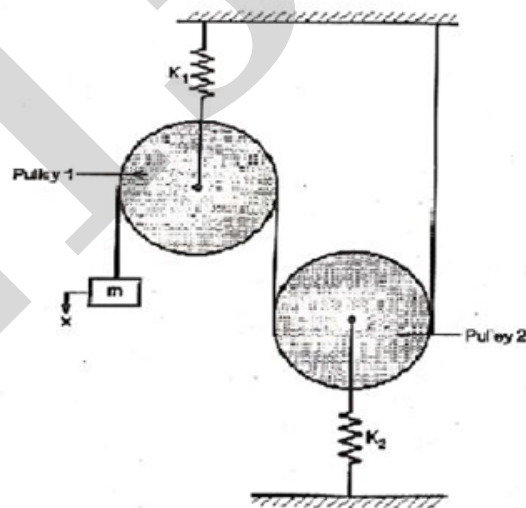


Fig. 1.b.

Q2)

a)

05 Marks

Explain forced vibrations due to rotating unbalance.

OR

Derive the equation for logarithmic decrement of Single Degree damped free vibration system. Make use of usual notations.

b)

07 Marks

A machine of mass one tonne is acted upon by an external force of 2450 N at frequency of 1500 rpm. To reduce the effect of vibration, isolator of rubber having static deflection 2 mm under the machine load and an estimated damping ratio (Damping factor) is 0.2. Determine force transmitted to foundation.

Q3)

[12]

Determine the natural frequency for the system shown in fig. 3. Take $K_1=1000$ N/m, $K_2=500$ N/m, $m_1= 50$ Kg and $m_2=10$ Kg.

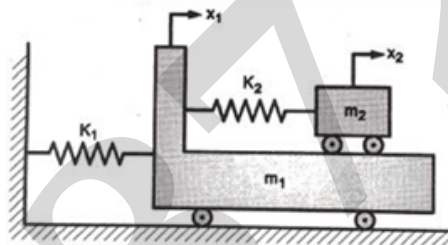


Fig. 3.

Q4)

[12]

a)

06 Marks

Explain Rayleigh's Method used to determine natural frequencies of multi degree free vibrating system.

OR

Write short note on Flexibility and stiffness influence coefficients.

b)

06 Marks

Using Holzer Method find natural frequency of system as shown in fig. 4. b. Take, $I_1 = I_2 = I_3 = 1$ and Take $K_{t1} = K_{t2} = 1$.

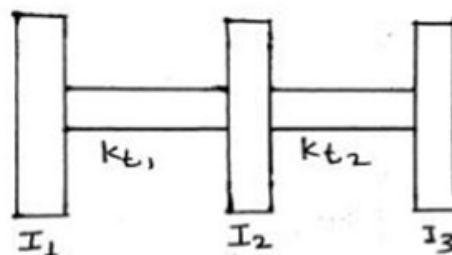


Fig. 4. b.

Q5)**a)****06 Marks**

Explain the Seismic mass instrument. How it can be used for measurement of Velocity.

OR

Explain with neat sketch different types of exciters used in FFT analyser.

b)**06 Marks**

A vibrometer consists of a seismic mass of 1 kg, spring of stiffness 50 N/m and a damping factor of 0.7. The amplitude of displacement shown on vibrator scale is 10 mm. If the vibrometer is mounted on a machine vibrating at 30 rad/s, Determine the amplitude of vibration of a machine.

Q6)**[10]****Attempt the following any two questions.****2×5=10 Marks**

- a)** Explain sound pressure level and sound intensity level.
- b)** What are sound pressure limits during day and night time in India for various zones?
- c)** Explain the following terms as used in hearing conservation
 - i) Threshold shift ii) Temporary threshold shift

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -

This Question Paper may be distributed for following Subjects as common code.

सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

- 1] (101) Bachelor of Engineering (68510) Noise and Vibration Part 4 SEM 8
- 2] (101) Bachelor of Engineering (84952) Noise and Vibration Part 4 SEM 8
- 3] (1154) B.Tech. CBCS (84845) Noise and Vibration Part 4 SEM 8