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B.Tech. (ME) (Sem.-7)
MECHANICAL VIBRATIONS

Subject Code: ME-408 Paper ID: [A0841]

Time: 3 Hrs. Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly:

- (a) What are elements of a vibrating system?
- (b) What do you understand by critical damping?
- (c) Differentiate between damped and undamped vibration.
- (d) What is vibration isolation?
- (e) What do you understand by whirling of shafts?
- (f) What are effects of vibration on a system?
- (g) Differentiate between under damped and over damped systems.
- (h) What are main causes of vibration?
- (i) What are influence coefficients?
- (j) What do you understand by normal mode of vibration?

SECTION-B

2. Explain various steps involved in vibration analysis.

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- 3. A mass of 10kg when suspended from a spring causes a static deflection of 0.01 m. Find the natural frequency of the system.
- 4. A body of mass 400kg is supported on springs such that its static deflection is 2mm. what should be the value of damping coefficient of a viscous damper to be added to the system in parallel with the springs so that the system is critically damper?
- 5. Describe the working of the Vibrometer with the help of neat sketch.
- 6. Derive the frequency equation for longitudinal vibration of a rectangular bar of length *l* having both ends free.

SECTION-C

- 7. Differentiate between dynamic vibration absorber and centrifugal pendulum vibration absorbers.
- 8. Find the fundamental frequency of the system shown in Figure 1.
- 9. Explain and differentiate between
 - (a) Coulomb Damping (b) Viscous Damping and (c) Interfacial Damping

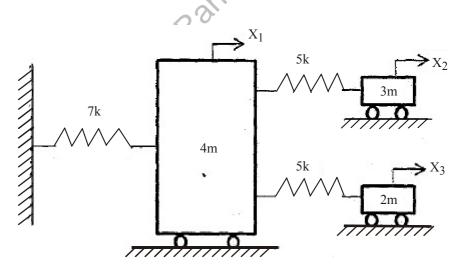


Fig. 1

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