Total No. of Questions – [04] Total No. of Printed Pages: 02

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OCTOBER 2019 / IN - SEM (T1)

F. Y. M. TECH. (Design Engineering) (SEMESTER - I)

COURSE NAME: Advanced Vibrations and Acoustics

COURSE CODE: MEPA11182

(PATTERN 2018:R1)

Time: [1 Hour] [Max. Marks: 20]

(*) Instructions to candidates:

1) **Answer Q.1 OR Q.2, Q.3 OR Q.4**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data where ever required**

Q.1 a) A mass of spring mass dashpot system is given an initial velocity of $A\omega_n$ Where ω_n is undamped natural frequency of the system. Find the equation of motion for a system when 1) ξ=2.0 2) ξ=1 06

b) Determine the mass M for the system as shown in Fig 01. Take K1= 2KN/mm, K2=1.5 KN/mm K3= 3.0 KN/mm and K4=K5=0.5 KN/mm. Take natural frequency of 12 Hz 04

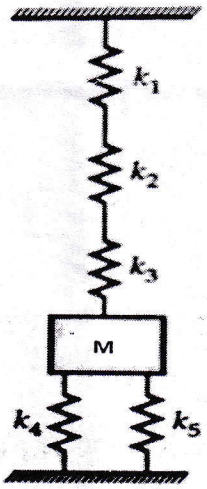

Fig-01

OR

Q.2.a) What are different types of damping?. Derive the expression for Logarithmic decrement. 06

b) Explain magnification factor in brief. 04

Q.3.a) Determine the 3 natural frequencies of the system as shown in Fig-02. Using Eigen value and Eigen vector method .Take K1=K2=K3=20, and m1=m2 =m3=5. 06

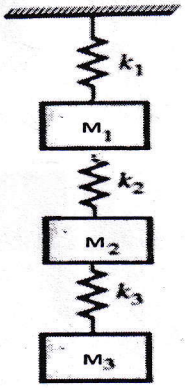

Fig-02

b) Derive the mode of vibration for the system having two masses fixed on tightly Stretched string 04

OR

Q.4.a) Determine resultant motion of m1 and m2 as shown in Fig-03 for the following cases 06

1) m1 up by 5mm and m2 hold fixed

2) m1 down by 5mm and m2 up by 7.5 mm.

Take m1=m2=9.8, K1=K3=8820N/m and K2=3430 N/m

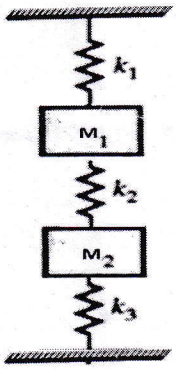

Fig-03

b) Explain different types of vibration absorbers with their application. 04