Seat No.

B.E(Mech) (Part- IV) (Semester -VIII) Examination, April-2017
NOISE & VIBRATION
Sub. Code : 68510
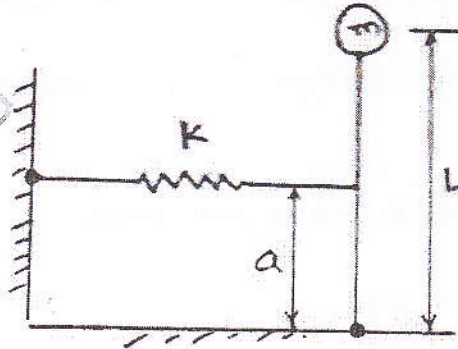
Day and Date : Saturday, 29 -04 - 2017
Time : 02.00 p.m to 05.00 p.m.

Total Marks : 100

Instructions :
1) All questions are compulsory.
2) Assume suitable data wherever necessary.
3) Draw neat sketch wherever necessary.

Q1) a) Explain the causes and effects of vibration. [8]

b) Derive the equation of natural frequency of the system shown in figure.[8]

OR

b) A mass of 1 kg is to be supported on a spring having stiffness of 9800 N/m. The damping coefficient is 4.9 N-s/m. Determine the natural frequency of the system. Also find the logarithmic decrement and the amplitude after 3 cycles if the initial displacement is 0.3 cm. [8]

Q2) a) Explain logarithmic decremert and derive the equation for the same. [8]

b) A 75 kg machine is mounted on springs of stiffness 11.76×10^5 N/m with damping factor of 0.2. A 2 kg piston within the machine has a reciprocating motion with stroke of 0.08 m and a speed of 3000 rpm. Assuming the motion of piston to be harmonic, determine the amplitude of vibration of the machine and the vibratory force transmitted to the foundation. [8]

P.T.O.

Q3) a) Explain semi-definite system related to two degree of freedom motion[8]

OR

Explain Torsional Vibration Absorber with neat sketch.　　　[8]

b) Derive the equation of natural frequency and mode shapes for the system of two masses fixed tightly on stretched string as shown in figure.　[8]

Q4) a) Write a short note on Matrix Iteration method.　　　　　　　[7]

OR

Derive the equation used in Holzer's method.

b) Determine the natural frequency of three rotor system shown in fig 4b.by Rayleigh's method. Given: $E=2.1*10^{11}$ N/m^2, Diameter of shaft 20mm.[11]

Q5) a) Explain in brief the condition monitoring and fault diagnosis of pump or gears.　　　　　　　　　　　　　　　　　　　[9]

b) Explain with neat sketch different type of exciters used in FFT analyzer.[7]

Q6) Attempt any TWO　　　　　　　　　　　　　　　　　　[16]

a) Explain the following terms in hearing consideration.
   i)　Threshold shift
   ii)　Temporary Threshold shift
   iii)　Permanent Threshold shift
   iv)　Daily dose of noise

b) Explain auditory effects of noise on people.

c) From noise measurements made in a particular community, it has been determined that the day-time L_{eq} is 79dB(A) and the night time L_{eq} is 59dB(A). Using these data, determine the day-night A-weighted average sound level.