Roll No .....

MMMD/MMPD - 205

M.E./M.Tech., II Semester

Examination, June 2016

Vibration and Noise Control

Time : Three Hours

Maximum Marks : 70

Note : Attempt any five questions. All questions carry equal marks. Assume suitable data, if necessary.

1. a) Explain in brief what do you understand by: 7
   i) Flexibility and stiffness influence coefficients
   ii) Generalized co-ordinates and co-ordinate couplings
   b) What is Modal Analysis and how can it be used for finding the forced vibration response of a typical three degree of freedom (un damped) vibration system? 7

2. The arrangement of compressor, turbine and generator in a thermal power plant is shown in figure 1. Find the natural frequency and mode shape using Holzer's method. 14

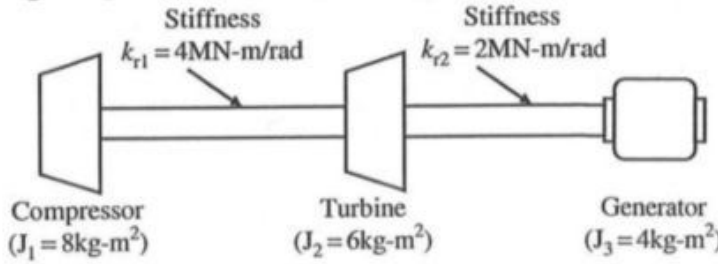

Figure 1

3. a) A uniform string is tightly stretched between $x = 0$ and $x = 1$ and is plucked at $x = 1/4$, through a distance h and then released from rest. Find its subsequent displacement. 7
   b) Derive the frequency equation of torsional vibrations for a free-free shaft of length l. 7

4. a) What is meant by "Condition Monitoring and diagnosis"? Explain vibration monitoring. 7
   b) Differentiate between: 7
   i) Active vibration isolation and passive vibration isolation
   ii) Transient vibrations and Random vibrations

5. a) Discuss the response of a single degree spring mass system subjected to unit impulsive force. 7
   b) Define Transmissibility ratio. A stereo turntable of mass 1kg generates an excitation force at a frequency 3Hz. If it is supported on a base through a rubber mount, determine the stiffness of the rubber mount to reduce the vibration transmitted to the base by 80%. 7

6. a) What is the source of nonlinearity in Duffing's equation? Discuss frequency domain analysis of a random response of a single DOF system. 7
   b) Define: Probability Density function, probability distribution function, Autocorrelation function, white noise. 7

7. a) Explain why accelerometer is preferred transducer for vibration measurement? Derive the equation for the mounted resonance frequency of an accelerometer. 7
   b) Explain the working of Sound Level Meter and Sound Frequency Analyzer. 7

8. Explain in brief, following with respect to noise: 14
   a) One third octave band analysis
   b) BIS Noise exposure limits
   c) Passive Noise control system

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