Total No. of Questions :8] *[Total No. of Printed Pages :3*

Roll No .....

MMPD-104

M.E./M.Tech. I Semester

Examination, December 2016

Theory of Vibration

Time : Three Hours

Maximum Marks : 70

Note **:** Attempt any five questions. All questions carry equal marks.

1. a) How vibration absorbers are tuned? Discuss torsional vibration absorber sytem.
   b) Deduce an equation for undamped forced vibrations with harmonic exitation.

2. Find the natural frequencies of vibration of the system shown in figure 1 below, using matrix method.

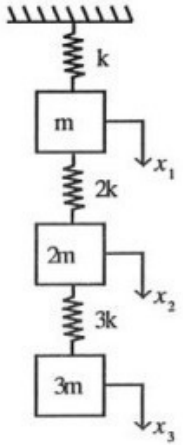

Figure 1

3. Find the natural frequencies of vibrations of the system shown in figure 2.

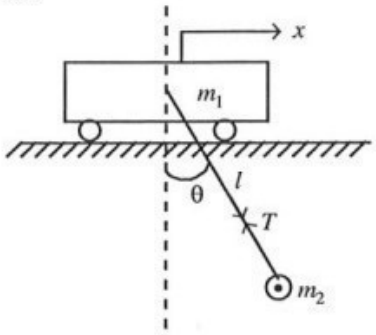

Figure 2

4. Discuss followings:
   a) Stodola's method
   b) Dunkerby's method

5. a) Explain perturbation method of non-linear vibration system.
   b) Write a brief note on self exited vibrations caused by dry friction.

6. Determine the equation of motion of the mass for free vibrations for the following cases
   a) Zeta < 1
   b) Zeta = 1
   c) Zeta > 1

   Details shown in figure 3 below:

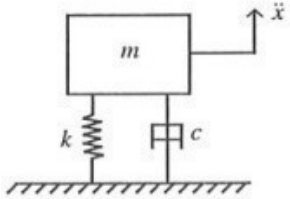

Figure 3

7. a) Explain Jump phenomenon with suitable example.
   b) Write down elementary idea of stable and unstable oscillations.

8. Write short notes on following:
   a) Narrow band and wide band random process
   b) Forced vibration with non-linear spring forces
   c) Rayleigh method
   d) Maxwell's raciprocal theorem

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