Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER–I(New course)• EXAMINATION – WINTER- 2015

Subject Code: 2710908 **Date: 04/01/2016**

Subject Name: Vibration and Noise

Time:2:30 pm to 5:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** An apparatus of mass *m* is shipped in a container as shown in Fig.1. In the process of unloading, the container is dropped from a height *h* to a hard floor. Find the response of the system. **07**

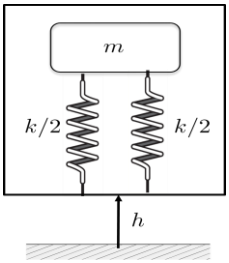

Fig.1

(b) Discuss Duhamel's integral method **07**

Q.2 **(a)** Explain the dynamic and static coupling with suitable example. **07**

(b) Determine the natural frequencies of the system shown in Fig. 2. **07**

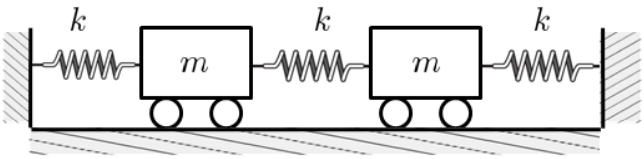

Fig.2

OR

(b) Derive the equations of motion for the system shown in Fig.3 using Lagrange's approach. **07**

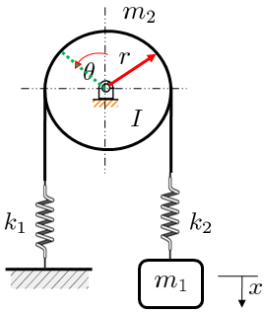

Fig.3

Q.3 **(a)** Determine the stiffness influence coefficients of the system shown in Fig.4 **07**

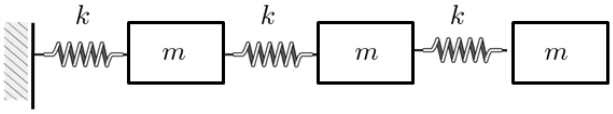

Fig.4

(b) Determine the Eigen values of the system shown in Fig.4 **07**

OR

Q.3 **(a)** Explain the methodology of finding the natural frequencies of the torsional vibration of three rotor system. **07**

(b) Explain Dunkerley's method with suitable example. **07**

Q.4 **(a)** Derive the equation of motion for longitudinal vibration of bars and discuss the solution methodology with suitable example. **07**

(b) Derive the equation of motion for transverse vibration of beams and discuss the solution methodology with suitable example. **07**

OR

Q.4 **(a)** Discuss: Dynamic vibration absorber. **07**

(b) Derive the transmissibility of the isolator shown in Fig. 5. **07**

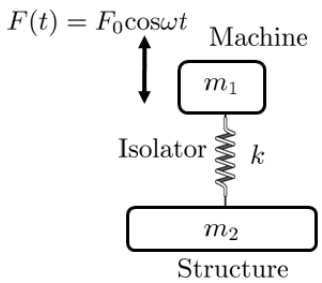

Fig.5

Q.5 **(a)** Explain: Vibration pickups

(b) Explain various frequency measuring instruments. **07**

OR

Q.5 **(a)** Discuss noise radiation and transmission. **07**

(b) Explain the method for measuring the sound intensity. **07**

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