GUJARAT TECHNOLOGICAL UNIVERSITY
M.E Sem-I Remedial Examination January/ February 2011
Subject code: 710902
Subject Name: Dynamics of Machinery
Date: 01 /02 /2011   Time: 02.30 pm – 05.00 pm
                                                                      Total Marks: 60

Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Assume suitable additional data if required stating clearly the assumptions made in your answer book.**
5. **Illustrate your answer with neat sketches wherever required.**

Q.1 **(a)** How will you determine jump speed for an eccentric cam operating a flat faced follower? Derive the equation. **06**

(b) An eccentric plate cam of 160 mm diameter and eccentricity of 40mm provides motion to a spring loaded follower of mass 2Kg whose axis is perpendicular to the axis of the cam and passes through its center. The spring has stiffness of 25N/mm. It is found that at certain speed, the follower ceases to have contact with cam, when cam has moved through 110^0 from its lowest position. Determine this speed. The initial compression of the spring is 32mm. Determine also the limiting angular speed of the cam to avoid cam jump. **06**

Q.2 **(a)** Discuss the mathematical model of cam and follower considering their elasticity. **06**

(b) Explain Johnson's numerical analysis method used for cam. **06**

OR

(b) Explain the importance of vibration analysis. Discuss any one of the vibration analysis method. **06**

Q.3 **(a)** Write a note on: - Noise control. **06**

(b) What do you meant by stability of a control system? Explain Routh's stability criteria. **06**

OR

Q.3 **(a)** State the various methods used for noise measurement. Explain any two of them. **06**

(b) Explain the normal modal harmonic analysis. **06**

Q.4 **(a)** State the different types of control actions used for automatic control systems. Discuss any two of them in detail with neat sketches. **06**

(b) Write short note on: - Transient and frequency response of a control system. **06**

OR

Q.4 **(a)** Explain briefly flexural and torsion vibrations. **06**

(b) Write a note on:- Vibration isolation of multi degree freedom system. **06**

Q.5 **(a)** State the different types of control actions used for automatic control systems. Discuss any two of them in detail with neat sketches. **06**

(b) Write short note on: - Transient and frequency response of a control system. **06**

Q.5 **(a)** State and justify the assumptions made for the governing equation of acoustic sound wave. What are the major considerations made for deriving the equation? **06**

(b) Differentiate between a closed loop and open loop systems. Explain simple liquid level controller giving neat sketch. **06**

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