Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – WINTER 2023

Subject Code:3160109 Date:07-12-2023

Subject Name:Theory of Vibration

Time:02:30 PM TO 05:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Define and shortly explain Vibration.	**03**
	(b)	How many ways you can control the vibration?	**04**
	(c)	What is Damping? Explain types of Damping.	**07**
Q.2	**(a)**	Define 1.Natural Frequency 2.Damping Ratio 3.Time Period	**03**
	(b)	Define: Overshooting. Why guns are designed based on critical damping?	**04**
	(c)	Classify different types of vibration.	**07**
		OR	
	(c)	Define and explain Free vibration & Forced vibration with examples.	**07**
Q.3	**(a)**	Define and shortly explain Amplitude.	**03**
	(b)	Discuss on Vibration Isolation.	**04**
	(c)	Write a short note on Vibration absorber.	**07**
		OR	
Q.3	**(a)**	What is Continuous system?	**03**
	(b)	Discuss on Critical Speed.	**04**
	(c)	Write a note on Vibration measuring instruments.	**07**
Q.4	**(a)**	Define Degree of Freedom.	**03**
	(b)	What is the equation of motion with harmonic force?	**04**
	(c)	Derive the equation to calculate natural frequency & time period of torsional vibration of single rotor system.	**07**
		OR	
Q.4	**(a)**	Shortly explain on Orthogonalality of modes.	**03**
	(b)	Explain Transmissibility.	**04**
	(c)	Prove that reduction in amplitude in one complete cycle in Coulomb damping is 4F/k.	**07**
Q.5	**(a)**	What is the difference between single degree and Double degree of freedom?	**03**
	(b)	How will you define Steady state and Transient vibration?	**04**
	(c)	Derive the equation to calculate natural frequency & time period of Simple pendulum.	**07**
		OR	
Q.5	**(a)**	Define Multi degree of freedom.	**03**
	(b)	Discuss on Rayleigh Method.	**04**
	(c)	Write a note on Co-ordinate Coupling.	**07**

****