Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2022

Subject Code:3170211 Date:12-01-2023

Subject Name:Automotive Noise Vibration and Harshness

Time:10:30 AM TO 01:00 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)**	What do you mean by Passive Damping?	**03**
	(b)	Explain Random Vibration.	**04**
	(c)	Write a short note on Microphone.	**07**
Q.2	**(a)**	Explain sound wave propagation.	**03**
	(b)	Explain effect of road roughness and road irregularities on vehicle vibrations in brief.	**04**
	(c)	Explain pass by noise test in details.	**07**
		OR	
	(c)	Explain low frequency noise from the vehicle with its frequency range. Also discuss the noise generating points and reduction methods.	**07**
Q.3	**(a)**	Explain sources of Interior Transportation Noise and Vibration.	**03**
	(b)	Explain engine air intake and exhaust noise in details.	**04**
	(c)	Explain Effects of Vibration on People.	**07**
		OR	
Q.3	**(a)**	Write a short note on psychological effects of noise on human.	**03**
	(b)	Give the merits, demerits and applications of Anechoic Chambers.	**04**
	(c)	Wrote a short note on Nyquist-Shannon Sampling Theorem.	**07**
Q.4	**(a)**	What do you mean by intensity of sound?	**03**
	(b)	Give the brief about NVH legislation for vehicles in India.	**04**
	(c)	Explain Bearing noise, Cam system noise and Timing chain noise from the automotive.	**07**
		OR	
Q.4	**(a)**	Define: noise, vibration and harshness.	**03**
	(b)	What are the differences between accelerometer and vibrometer?	**04**
	(c)	Write a short note on Sound Level Meters.	**07**
Q.5	**(a)**	Explain impedance hammer used to measure vibration in brief.	**03**
	(b)	Explain Antialiasing Filter.	**04**
	(c)	Enlist different types of transducers and explain any two in brief.	**07**
		OR	
Q.5	**(a)**	Explain Signal-to-Noise Ratio.	**03**
	(b)	Explain difference between noise and vibration produces by Diesel and Petrol engine with their probable reasons.	**04**
	(c)	Write a short note Fourier Series for Periodic Functions.	**07**

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