

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2021

Subject Code:3170211

Date:29/12/2021

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) Define: noise, vibration and harshness.	03
	(b) Differentiate between free vibration and forced vibration.	04
	(c) Explain the anatomy of human ear with neat sketch.	07
Q.2	(a) Define terms: Rolling, Pitching and Yawing.	03
	(b) Give the causes of interior noise of vehicle.	04
	(c) Discuss the characteristics and sources of vibration generated in power train.	07
OR		
	(c) Explain structure borne and air borne sound with respect to vehicle.	07
Q.3	(a) What is Acoustics of vehicle?	03
	(b) Explain engine air intake and exhaust noise in details.	04
	(c) Explain pass by noise test in details.	07
OR		
Q.3	(a) What do you mean by accelerometer and vibrometer?	03
	(b) Explain effect of road roughness and road irregularities on vehicle vibrations in brief.	04
	(c) Enlist different types of transducers and explain any two in brief.	07
Q.4	(a) What do you mean by single degree of freedom?	03
	(b) Explain any one noise control technique in brief.	04
	(c) Write a short note on Microphone.	07
OR		
Q.4	(a) Explain impedance hammer used to measure vibration in brief.	03
	(b) What is CFD? Give the advantages and disadvantages of CFD.	04
	(c) Explain basics of construction and working of sound measuring device.	07
Q.5	(a) Discuss about noise absorbing material in short.	03
	(b) Give the merits, demerits and applications of Anechoic Chambers.	04
	(c) Classify damper and explain Hydraulic damper with neat sketch.	07
OR		
Q.5	(a) What do you mean by harshness and explain acceptance level.	03
	(b) Give the brief about NVH legislation for vehicles in India.	04
	(c) Explain psychological effect of noise and vibration on human in details.	07