

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VIII (NEW) EXAMINATION – WINTER 2017****Subject Code: 2180209****Date: 15/11/2017****Subject Name: Noise, Vibration & Harshness and Safety****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.

		MARKS
Q.1	(a) Define (i) Noise (ii) Vibration (iii) Harshness in reference to vehicular application.	03
	(b) List out the equipments used in NVH and give the applications of each.	04
	(c) Derive wave equation of sound.	07
Q.2	(a) Give the classification of vibration with short detail.	03
	(b) What is Structure borne sound and air borne sound?	04
	(c) What is CFD? Give the advantages and disadvantages of CFD.	07
OR		
	(c) Explain MATLAB/SIMULINK for automotive system design.	07
Q.3	(a) Give the advantages and applications of Rubber embedded metallic bushes.	03
	(b) Give the sources of Vibrations in vehicle.	04
	(c) Write a short note on Passive and Active suspension.	07
OR		
Q.3	(a) What is Acoustics of vehicle?	03
	(b) Discuss an importance of Damper. How it's working?	04
	(c) Explain vibration due to tire and wheel in detail.	07
Q.4	(a) What are the Noise limits in Db for two and three wheelers in India?	03
	(b) Describe Doppler effect.	04
	(c) Classify the Transducers and explain Piezoelectric transducers.	07
OR		
Q.4	(a) Which are the causes of squeaky brakes?	03
	(b) Write a short note on Viscous damping.	04
	(c) Classify damper and explain Hydraulic damper with neat sketch.	07
Q.5	(a) What is vibration isolation?	03
	(b) Give the merits, demerits and applications of Anechoic Chambers.	04
	(c) Write a short note on Microphone.	07
OR		
Q.5	(a) Explain porous sound absorbers in brief.	03
	(b) Describe Psychological effect of noise and vibrations.	04
	(c) Compare Active safety features with Passive safety features of a vehicle.	07