

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VIII (NEW) EXAMINATION – WINTER 2018****Subject Code: 2180209/2180214****Date: 19/11/2018****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 terms: Rolling, Pitching and Yawing.	03
	(b) Differentiate between free vibration and forced vibration.	04
	(c) Explain structure borne and air borne sound with respect to vehicle.	07
Q.2	(a) Define: noise, vibration and harshness.	03
	(b) Give the causes of interior noise of vehicle.	04
	(c) Explain the anatomy of human ear with neat sketch.	07
OR		
	(c) Discuss the characteristics and sources of vibration generated in power train.	07
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
OR		
Q.3	(a) Explain working principle of condenser type microphone used in sound measuring device.	03
	(b) Explain engine air intake and exhaust noise in details.	04
	(c) Explain pass by noise test in details.	07
Q.4	(a) Explain impedance hammer used to measure vibration in brief.	03
	(b) Explain anechoic chamber in details.	04
	(c) Explain sources of noise in vehicles in details.	07
OR		
Q.4	(a) What do you mean by single degree of freedom?	03
	(b) Explain any one noise control technique in brief.	04
	(c) Explain basics of construction and working of sound measuring device.	07
Q.5	(a) What do you mean by harshness and explain accepta	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
OR		
Q.5	(a) Discuss about noise absorbing material in short.	03
	(b) Differentiate between active safety and passive safety in vehicle.	04
	(c) Enlist five safety devices used in vehicle and explain construction and working of any two in brief.	07
