

**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.

		<b>MARKS</b>
<b>Q.1</b>	(a) Define terms: Rolling, Pitching and Yawing.	<b>03</b>
	(b) Differentiate between free vibration and forced vibration.	<b>04</b>
	(c) Explain structure borne and air borne sound with respect to vehicle.	<b>07</b>
<b>Q.2</b>	(a) Define: noise, vibration and harshness.	<b>03</b>
	(b) Give the causes of interior noise of vehicle.	<b>04</b>
	(c) Explain the anatomy of human ear with neat sketch.	<b>07</b>
<b>OR</b>		
	(c) Discuss the characteristics and sources of vibration generated in power train.	<b>07</b>
<b>Q.3</b>	(a) What do you mean by accelerometer and vibrometer?	<b>03</b>
	(b) Explain effect of road roughness and road irregularities on vehicle vibrations in brief.	<b>04</b>
	(c) Enlist different types of transducers and explain any two in brief.	<b>07</b>
<b>OR</b>		
<b>Q.3</b>	(a) Explain working principle of condenser type microphone used in sound measuring device.	<b>03</b>
	(b) Explain engine air intake and exhaust noise in details.	<b>04</b>
	(c) Explain pass by noise test in details.	<b>07</b>
<b>Q.4</b>	(a) Explain impedance hammer used to measure vibration in brief.	<b>03</b>
	(b) Explain anechoic chamber in details.	<b>04</b>
	(c) Explain sources of noise in vehicles in details.	<b>07</b>
<b>OR</b>		
<b>Q.4</b>	(a) What do you mean by single degree of freedom?	<b>03</b>
	(b) Explain any one noise control technique in brief.	<b>04</b>
	(c) Explain basics of construction and working of sound measuring device.	<b>07</b>
<b>Q.5</b>	(a) What do you mean by harshness and explain accepta	<b>03</b>
	(b) Give the brief about NVH legislation for vehicles in India.	<b>04</b>
	(c) Explain psychological effect of noise and vibration on human in details.	<b>07</b>
<b>OR</b>		
<b>Q.5</b>	(a) Discuss about noise absorbing material in short.	<b>03</b>
	(b) Differentiate between active safety and passive safety in vehicle.	<b>04</b>
	(c) Enlist five safety devices used in vehicle and explain construction and working of any two in brief.	<b>07</b>

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