

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
EIGHTH SEMESTER B.TECH DEGREE EXAMINATION, MAY 2019

Course Code: AU486

Course Name: Noise, Vibration and Harshness

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any three full questions, each carries 10 marks.

Marks

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|---|----|--|-----|
| 1 | a) | With a neat diagram explain natural frequency and resonance. | (3) |
| | b) | Write short notes on vibration measuring instruments and NVH analyser. | (4) |
| | c) | What are the various vibrating forces in automobiles and transmission path? | (3) |
| 2 | a) | With a neat diagram explain the classification of vibrations. | (5) |
| | b) | With a neat diagram explain the classification of degree of freedom. | (5) |
| 3 | a) | Write a short on the effects of infrasound in humans? | (3) |
| | b) | Write a short note on the effects of low frequency noise in humans? | (3) |
| | c) | What are the effects of ultrasound on people? How the noise exposures effect the children? | (4) |
| 4 | a) | Write a short note on 1) whole body vibration, 2) hand arm vibration. | (4) |
| | b) | With a neat diagram explain the working principle of accelerometer. | (6) |

PART B

Answer any three full questions, each carries 10 marks.

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| 5 | a) | How the noise characteristic of vehicle is classified? | (3) |
| | b) | Mention the various noise control techniques used in industry. | (3) |
| | c) | Write a short note on engine overall noise level. | (4) |
| 6 | a) | Diagnose the engine noise in vehicle. | (5) |
| | b) | How the mechanical noise in vehicle can be assessed? | (5) |
| 7 | a) | With an example define tuned vibration absorbers. | (5) |
| | b) | With an example define untuned viscous damper. | (5) |
| 8 | a) | Explain the term engine isolation and write down benefits of engine isolation. | (5) |
| | b) | With a neat diagram explain crank shaft damping process | (5) |

PART C

Answer any four full questions, each carries 10 marks.

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| 9 | a) | With an example explain noise dose level and noise criteria. | (6) |
| | b) | Write a short note on noise legislation or regulation. | (4) |

- 10 a) Define frequency and explain the frequency analysis of sound waves. (4)
b) Define the terms 1) fundamental frequency 2) 2nd harmonic 3) 3rd harmonic 4) composite waves. (3)
c) Define the terms partial tracking analysis and chord sequence analysis. (3)
- 11 a) Explain predictive analysis of noise control. (3)
b) Write a short note on effect of noise in palliative treatment. (2)
c) Define the general sources of noise control in automotive. (5)
- 12 Write a short note on velocity sensors and capacitive sensors. (10)
- 13 With neat diagram explain 1) shear mode accelerometer, 2) flexural mode accelerometer 3) compression mode accelerometer. (10)
- 14 a) How the sound power level and emission sound pressure level are described. (7)
b) Write a short note on sound intensity measurement. (3)
