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Question Paper Code : 90463

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019

Fifth Semester

Electrical and Electronics Engineering

OME 552 – VIBRATION AND NOISE CONTROL

(Common to Fashion Technology/Handloom and Textile Technology/Textile Chemistry/Textile Technology/Civil Engineering/Electronics and Instrumentation Engineering/Instrumentation and Control Engineering)

(Regulations 2017)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. What is meant by damping ratio and its characteristics ?
2. What do you mean by beating phenomenon ?
3. Define sound pressure level.
4. What is frequency analysis ?
5. Classify the noise characteristics of engine.
6. What is brake noise ?
7. Mention some applications of vibration absorbers.
8. Name different types of actuators used in active vibration control.
9. What is mechanical noise ?
10. Name two types of noise control equipments.



11. a) Derive the energy dissipated in viscous damping system.
(OR)
- b) Find the total response of a single degree of freedom system with mass 10 kg, damping coefficient 20 Ns/m, stiffness 4000 N/m and initial displacement 0.01 m and zero initial velocity under an external force $F(t) = F_0 \cos \omega t$ acts on the system with $F_0 = 100$ N and $\omega = 10$ rad/s.
12. a) Discuss the various elements in noise measuring system.
(OR)
- b) What is time-frequency analysis? What is Fourier transform and its representations?
13. a) Diagnose the transmission noises and name three main causes of transmission noises.
(OR)
- b) Discuss the three tire noises and also the ways to reduce combustion noise.
14. a) Elucidate the experimental modal analysis.
(OR)
- b) Discuss about active vibration isolation system.
15. a) Elaborate on Acoustic Enclosures and Noise Barriers.
(OR)
- b) How do you reduce the amount of noise emitted by exhaust of an internal combustion engine?

16. a) A heavy machine, weighing 3000 N, is supported on a resilient foundation. The static deflection of the foundation due to the weight of the machine is found to be 7.5 cm. It is observed that the machine vibrates with an amplitude of 1 cm when the base of the foundation is subjected to harmonic oscillation at the undamped natural frequency of the system with an amplitude of 0.25 cm. Find the damping constant of the foundation, the damping force amplitude on the base and the amplitude of the displacement of the machine relative to the base.
(OR)
- b) Deduce the dynamic forces generated by internal combustion engine.