

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE- SEMESTER VI (OLD) – • EXAMINATION – WINTER 2017**

**Subject Code: 160103****Date: 03-11-2017****Subject Name: Vibration and Noise Control****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.

- Q.1** (a) Define Vibration. What are the main reasons of vibration? State the importance of vibration study in engineering. **07**
- (b) Define following terms: **07**
- Resonance
  - Degrees of Freedom
  - Damping
  - Time Period
  - Natural Frequency
  - Periodic Motion
  - Forced Vibrations
- Q.2** (a) What is Damping? Why it is needed? Also prove that in case of Coulomb damping amplitude reduces by  $4F/k$  in one complete cycle. **07**
- (b) Explain the types of damping in detail **07**
- OR**
- (b) Describe Beats phenomena along with neat sketches **07**
- Q.3** (a) Discuss and describe Logarithmic Decrement **07**
- (b) A damper offers resistance of  $0.05N$  at constant velocity of  $0.04$  m/sec. The damper is used with  $k= 9$  N/m. Determine the damping and frequency of the system when mass of the system is  $0.10$  kg. **07**
- OR**
- Q.3** (a) Explain the working principles of an accelerometer along with a neat sketch. **07**
- (b) Write a short note on frequency measuring device **07**
- Q.4** (a) Derive the equations for an under-damped system **07**
- (b) Explain basics of Vibration absorbers with example. What is the difference between vibration absorber and vibration isolator. **07**
- OR**
- Q.4** (a) Explain the working principles of vibrometer along with a neat sketch. **07**
- (b) Derive the equations for an over-damped system **07**
- Q.5** (a) Describe in detail vibration isolation **07**
- (b) Write a note on Transmissibility. **07**
- OR**
- Q.5** (a) Explain **07**
1. Torsionally equivalent shaft.
  2. Control of Vibrations
- (b) Explain in detail series and parallel connections of Springs. **07**

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