

Roll No.:

SGT UNIVERSITY

END TERM THEORY EXAMINATION JULY-2022

Faculty/College of Study:	Engineering & Technology	Year/Semester:	6 th Semester
Program:	B. Tech. (ME)	Duration:	03:00 Hrs.
Course/Subject:	Mechanical Vibration	Maximum Marks:	60
Course/Subject Code:	13030615, 13030608	Batch:	2017, 2018, 2019

Instructions:-

1. Write Your Roll No. on the Question Paper.
2. Candidate should ensure that they have been provided correct question paper. Complaint(s) in this regard, if any should be made within 15 minutes of the commencement of the exam. No complaint(s) will be entertained thereafter.
3. All Questions are compulsory. Marks are indicated against each question.
4. Illustrate your answer with diagram wherever required.

SECTION-A

(Very Short Answer Type Questions)

Note: All Questions are compulsory: -

[12X1=12 Marks]

S. No.	Question	Marks Allotted
1	What are the main reasons of vibration?	1
2	What do you mean by resonance?	1
3	Explain degree of freedom along with schematic representation of single degree freedom system.	1
4	Explain the use of vibration absorbers in mechanical systems.	1
5	What do you mean by eigenvalues?	1
6	What is the importance of vibration excitors?	1
7	What do you mean by flexibility matrix?	1
8	What do you mean by Longitudinal Vibration?	1
9	What do you mean by Critical speed of the shaft?	1
10	Define time period of vibration.	1
11	What do you mean by magnification factor?	1
12	Explain Torsional vibrations with suitable application?	1

SECTION-B
(Short Answer Type Questions)

Note: All Questions are compulsory: -

[4X2=8 Marks]

S. No.	Question	Marks Allotted
13	Write a short note on vibration isolation.	2
14	Explain the importance and use of the Rayleigh Method in mechanical vibration.	2
15	What do you mean by transverse vibration? Also, give examples.	2
16	Define modal matrix. Also, write it in mathematical form.	2

SECTION-C
(Descriptive Answer Type Questions)

Note: All Questions are compulsory: -

[4X4=16 Marks]

S. No.	Question	Marks Allotted
17	Explain the types of damping in detail with suitable schematic diagrams.	4
18	Derive an expression for natural frequency using Equilibrium method.	4
19	Explain the working principle and constructional details of the Vibration Absorber.	4
20	Explain vibration isolation and transmissibility.	4

SECTION-D
(Long Answer Type Questions)

Note: All Questions are compulsory: -

[4X6=24 Marks]

S. No.	Question	Marks Allotted
21	A gun barrel mass 560 kg is designed with the following data: Initial recoil velocity 36 m/sec; Recoil distance on firing 1.5 m, calculate: (a) spring constant, (b) damping coefficient, and (c) time required for the barrel to return to a position 0.12 m from its initial position.	6
22	Explain Under Damped, Critical Damped and Over Damped Systems in detail.	6
23	A vibratory system is defined by the following parameters $m = 3\text{kg}$, $k = 100\text{ N/m}$, $C = 3\text{ N-sec/m}$. Determine (a) damping factor, (b) natural frequency of damped vibration (c) logarithmic decrement (d) ratio of two successive amplitudes.	6
24	Explain in detail about Frahm Tachometer.	6