TEACHING SCHEDULE

Academic Year: 2019-2020
Semester-III
Course Title: Oscillations, Waves and Sound
Course Code: PHY-E3
Class Room: B305 & B203
Timings: 10.30am-11.30pm, 12.30pm-1.30pm
Day: Tuesday, Wednesday, Thursday
Course In-Charge: Ms. Pearl I. Oliveira

Lecture No.	Topic	Content	References
1	**1)Undamped free oscillation**	Different type of equilibria (Stable, unstable and neutral equilibrium) Periodic oscillations and potential well	Mathur 5.9 Page 246
2		Differential equation for simple harmonic oscillator and its solutions. Energy of the harmonic oscillator	John Taylor 5.2 Page 163
3		Examples of simple harmonic oscillations: Simple pendulum	Mathur 7.7 Page 329 Subrahmanyam 1.15 Page 34
4		Compound Pendulum	
5		Compound Pendulum	
6		Spring and mass system, torsional pendulum	Mathur 7.7 Page 336
7		Bifilar oscillations, Helmholtz resonator	Mathur 7.7 Page 339
8		Superposition of two simple harmonic motions of the same frequency along the same line. Superposition of two mutually perpendicular simple harmonic vibrations of the same frequency.	Subrahmanyam 2.2 Page 99
9		Superposition of two mutually perpendicular simple harmonic vibrations and having time periods in the ratio 1:2. Uses of Lissajous' figures.	Subrahmanyam 2.26 Page110
10		CA-I WT -I	
11		PROBLEMS	
12		PROBLEMS	
13		CA-II ONBT-I	
14	**2) Damped**	Introduction. Differential equation of	John Taylor

	Oscillations	damped harmonic oscillator and its solution,	
15		Discussion of different cases (Strong, weak and Critical damping).	Mathur
16		Contd.	
17		Logarithmic decrement. Energy equation of damped oscillations	Mathur
18		Power dissipation. Quality factor	Mathur
19		PROBLEMS	
20		PROBLEMS	
21		CA-II ONBT-II	
22	**3) Driven Damped Oscillations**	Introduction, Differential equation of forced oscillation and its solution (transient and steady state).	John Taylor
23		Continued	John Taylor
24		Resonance. Width of the resonance; the Q factor.	Mathur
25		The phase at resonance. Velocity resonance.	Mathur
26		PROBLEMS	
27		PROBLEMS	
28		CA-II ONBT-II	
29		CA-I WT -II	
30	**4) Waves and Sound**	Transverse vibrations in strings. Velocity of longitudinal waves in gases. Newton's formula for velocity of sound.	Khanna
31		Velocity in a homogeneous medium. Laplace’s correction.	Khanna
32		Kundt's tube-determination of velocity of sound in a gas and in solids. Intensity level and Bel and Decibel.	Khanna
33		Production and detection of Ultrasonic waves and its applications	Subrahmanyam
34		Continued	
35		PROBLEMS	
36		CA-III MCQ-I	
37	**5) Doppler Effect**	Explanation of Doppler effect in sound. Observer in rest and source in motion. Source at rest and observer in motion.	Subrahmanyam
38		When both source and observer are in motion. Effect of wind velocity.	Subrahmanyam
39		Doppler effect in light. Applications of Doppler effect.	Subrahmanyam
40		PROBLEMS	

41		PROBLEMS	
42		CA-III MCQ-II	
43		Discussion of SEE	
44		Revision (Problem Solving)	
45		Revision (Problem Solving)	