VIKASH INSTITUTE OF TECHNOLOGY, BARGARH

LESSON PLAN

Semester:2ND		**Year: 1ST YEAR**	**Course: B.Tech**
Branch :		**Sub: PHYSICS**	**Total Credit:03**
		Sub Code :	
Name of the Faculty:		**DOLLY HANSA**	
Designation :		**LECTURER**	
Department :		PHYSICS	
Session		**2024-25**	
Recommended Books		**Text book**:	
		1. Ian G. Main, Oscillations and waves in physics, Cambridge University Press	
		2. A. Ghatak, Optics, McGraw Hill Publisher	
		Reference Books:	
		1.H.J. Pain, The physics of vibrations and waves, John Wiley & Sons Ltd	
		2 A. Ghatak, Optics, McGraw Hill Publisher	

Sl. No.	Lecture No.	Topics to be covered	No. of Classes
		MODULE-1:OSCILLATIONS	
1	Lecture-01	Mechanical simple harmonic oscillators	**8**
2	Lecture-02	electrical simple harmonic oscillators	
3	Lecture-03	damped harmonic oscillator - heavy damping	
4	Lecture-04	critical and light damping	
5	Lecture-05	energy decay in a damped harmonic oscillator, quality factor	
6	Lecture-06	forced mechanical oscillators	
7	Lecture-07	electrical oscillators	
8	Lecture-08	steady state motion of forced damped harmonic oscillator	
		MODULE-2 : WAVES AND OPTICS	
9	Lecture-09	Concept of wave and Wave equation	**10**
10	Lecture-10	Superposition of many harmonic waves	
11	Lecture-11	Concept of coherent sources (Division of wave front and division of amplitude)	
12	Lecture-12	Interference in thin parallel film	
13	Lecture-13	Newton's ring: Determination of wavelength of light	
14	Lecture-14	Refractive index of liquid	
15	Lecture-15	Concept of diffraction -Huygen's Principle	
16	Lecture-16	Types of diffraction	
17	Lecture-17	Franhoffer diffraction due to single slit	
18	Lecture-18	diffraction grating (qualitatively)	
		MODULE-3: ELCTROMAGNETISM	
19	Lecture-19	Vector calculus: Gradient, Divergence	
20	Lecture-20	Curl (Mathematical concept)	
21	Lecture-21	Gauss divergence theorem	
22	Lecture-22	Stoke's theorem(statement only	

23	Lecture-23	Derivation of Maxwell's electromagnetic equation in differential form	9

24	Lecture-24	and integral form	
25	Lecture-25	Electromagnetic wave equations for E and B in vacuum	
26	Lecture-26	and conducting medium,	
27	Lecture-27	transverse nature of EM waves.	
MODULE-4: QUANTUM PHYSICS			
28	Lecture-28	Wave particle duality	**9**
29	Lecture-29	concept of phase velocity group velocity	
30	Lecture-30	relation between them	
31	Lecture-31	Matter waves (de Broglie hypothesis)	
32	Lecture-32	Wave functions, Observables as operators	
33	Lecture-33	Eigen function and Eigen values	
34	Lecture-34	Normalization, Expectation values	
35	Lecture-35	Schrodinger equation (Time dependent and time independent),	
36	Lecture-36	Particle in a box.	
MODULE-5: LASERS			
37	Lecture-37	Introduction to Laser, Characteristics of Lasers	**9**
38	Lecture-38	Einstein's coefficients	
39	Lecture-39	and relation between them	
40	Lecture-40	Lasing action	
41	Lecture-41	Population inversion	
42	Lecture-42	Three and four level pumping schemes,	
43	Lecture-43	Ruby Laser,	
44	Lecture-44	He-Ne Laser.	
45	Lecture-45	Revision	

Signature of Faculty Member **Signature of HOD**

PRINCIPAL