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Code No. : 12114 B O

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD

Accredited by NAAC with A++ Grade

B.E. II-Semester Backlog Examinations, September-2022

Applied Physics

(Common to Civil & Mech. Engg.)

Time: 3 hours

Max. Marks: 60

Note: Answer all questions from Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	What is simple oscillator? Write the equation of motion of simple oscillator.	2	1	1	1,2,12
2.	Compare electrical and mechanical oscillator.	2	2	1	1,2,12
3.	List out the conditions required for interference of light waves.	2	1	2	1,2,12
4.	Calculate the specific rotation of the plane of polarization is turned through 26° traversing 20cm length of 20% sugar solution.	2	3	2	1,2,12
5.	List out the main characteristics of laser.	2	2	3	1,2,12
6.	Mention the factors responsible for attenuation in optical fibers.	2	3	3	1,2,12
7.	Write the properties of ultrasonics.	2	1	4	1,2,12
8.	A cinema hall has a volume of 7500m^3 . What should be the total absorption in the hall if the reverberation time of 1.5 sec is to be maintained?	2	3	4	1,2,12
9.	Write the relation between Boyle, Inversion and Critical temperature.	2	2	5	1,2,12
10.	What do you understand by regenerative cooling?	2	3	5	1,2,12
Part-B (5 × 8 = 40 Marks)					
11. a)	Set up the differential equation of a damped oscillator and show that the amplitude varies sinusoidally under low damping conditions.	5	3	1	1,2,12
b)	A simple pendulum of length 100cm has an energy equal to 0.3J when its amplitude is 2cm. what will be its energy if its length is increased to 150cm.	3	3	1	1,2,12
12. a)	Obtain an expression for resultant Intensity due to Fraunhofer Diffraction at single slit and draw intensity distribution curve.	5	2	2	1,2,12
b)	In a Newton's rings experiment the diameter of 8 th and 16 th dark ring are 0.5cm and 0.7cm respectively. If the wavelength of the light is 5890\AA , find the radius of curvature of the lens.	3	3	2	1,2,12

Contd... 2

13. a)	With energy level diagram describe the construction and working of He:Ne laser.	5	1	3	1,2,12
b)	A silica optical fibre has a core refractive index of 1.50 and a cladding refractive index of 1.47. Determine the critical angle, the numerical aperture for the fiber and the acceptance angle in air for the fibre	3	3	3	1,2,12
14. a)	Describe the construction and working of magnetostriction oscillator using neat diagram.	5	2	4	1,2,12
b)	Calculate the thickness of the Quartz plate needed to produce ultrasonic waves of frequencies (i) 2MHz (ii) 30MHz. Given that density of Quartz crystal is 2650kg/m^3 and $Y = 8 \times 10^{10} \text{ N/m}^2$.	3	4	4	1,2,12
15. a)	With a neat sketch describe the liquefaction of air by Linde's process.	5	2	5	1,2,12
b)	Write any <i>six</i> applications of cryo fluids.	3	3	5	1,2,12
16. a)	What is compound pendulum? Derive the relation between period of oscillation and moment of inertia of a physical pendulum.	4	2	1	1,2,12
b)	Explain interference in thin films due to reflected light (cosine law).	4	2	2	1,2,12
17.	Answer any <i>two</i> of the following:				
a)	With the help of block diagram explain the various parts in optical fibre in communication	4	3	3	1,2,12
b)	What is Acoustic quieting? Explain the different aspects of acoustic quieting.	4	1	4	1,2,12
c)	Briefly explain adiabatic demagnetization.	4	2	5	1,2,12

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level - 1	20%
ii)	Blooms Taxonomy Level - 2	40%
iii)	Blooms Taxonomy Level - 3 & 4	40%
