LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

U.G. DEGREE EXAMINATION – **ALLIED**

SECOND SEMESTER – **APRIL 2023**

UPH 2301 – PHYSICS FOR CHEMISTRY

Date: 10-05-2023 Dept. No. Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

	SECTION A - K1 (CO1)	
	Answer ALL the Questions	**(10 x 1 = 10)**
1.	**Definitions**	
a)	Velocity.	
b)	Surface tension.	
c)	Boyle's Law.	
d)	Polarization.	
e)	Unit cell.	
2.	**Fill in the blanks**	
a)	When a body moves from one place to another, the shortest distance travelled is _____.	
b)	The SI unit of Young's modulus of elasticity is _____.	
c)	Overlapping of the _____ waves produce interference.	
d)	_____ is an example for linear motion.	
e)	There are _____equations of motions.	
	SECTION A - K2 (CO1)	
	Answer ALL the Questions	**(10 x 1 = 10)**
3.	**Match the following**	
a)	Longitudinal stress -	Interference
b)	Elasticity -	Fourteen
c)	Joule -	Force per unit area
d)	Bravais lattices -	Steel
e)	Newton's Ring -	Newton metre
4.	**True or False**	
a)	In a projectile motion, horizontal component is at constant acceleration.	
b)	Water and benzene have the same surface tension.	
c)	Energy can neither be created nor be destroyed.	
d)	Sound waves cannot be diffracted.	
e)	Crystals are classified into seven crystal groups.	
	SECTION B - K3 (CO2)	
	Answer any TWO of the following in 100 words	**(2 x 10 = 20)**
5.	Set up and solve the equation of motion of a simple pendulum and find an expression for the period of oscillation.	
6.	Define surface energy. Derive the expression for excess pressure inside a liquid drop.	

7.	What are Miller indices? Write the procedure for finding Miller indices of a crystal plane.
8.	Explain rotating crystal method in X- ray diffraction studies.
	SECTION C – K4 (CO3)
	Answer any TWO of the following in 100 words (2 x 10 = 20)
9.	a) Derive an expression for the maximum height, time of flight and horizontal range of a body projected with an initial velocity u at an angle θ with the horizontal. (6) b) Find the angle of projection at which the horizontal range and maximum height of a projectile are equal. (4)
10.	Derive Poisueille's formula for the rate of flow of liquid through a capillary tube.
11.	Describe the measurement of thickness of a wire by air wedge experiment.
12.	Discuss Fraunhofer diffraction at a narrow single slit
	SECTION D – K5 (CO4)
	Answer any ONE of the following in 250 words (1 x 20 = 20)
13.	Explain the three moduli of elasticity and Poisson's ratio. Obtain the relations connecting them.
14.	a) Discuss an experiment to demonstrate the double refraction of light. (10) b) Derive the conditions for interference in thin films. (10)
	SECTION E – K6 (CO5)
	Answer any ONE of the following in 250 words (1 x 20 = 20)
15.	a) Describe the drop weight method of determining the surface tension and interfacial surface tension of a liquid. (14) b) Water flows through a horizontal tube of length 0.2 m and internal radius 8.1×10^{-4} m under a constant head of the liquid 0.2 m. In 12 minutes 8.64×10^{-4} m^3 of liquid flow out from the tube. Calculate the coefficient of viscosity of water. (The density of water = 1000 kg m^{-3} and g = 9.81 ms^{-2}). (6)
16.	a) With the required diagrams describe the seven crystal systems. (10) b) Discuss the various symmetry operations performed in a crystal lattice. (10)

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