

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION DECEMBER 2024
(Third Semester)

Common to Branches - **CHEMISTRY & BIOCHEMISTRY**

PHYSICS - I

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Lissajous figures are produced by the combination of a) Two linear motion b) Two circular motion c) Two simple harmonic motion d) one linear motion and one circular motion	K1	CO1
	2	What types of crystals are commonly used in ultrasonic transducers? a) Quartz b) Diamond b) c) Silicon d) Piezoelectric	K2	CO1
2	3	The rigidity modulus is defined as the ratio of a) shear stress to shear strain b) normal stress to normal strain c) volume stress to volume strain d) linear stress to linear strain	K1	CO2
	4	In which of the following applications is viscosity an important factor? a) Aerodynamics b) lubrication c) optics d) thermodynamics	K2	CO2
3	5	Under which condition will a gas experience the largest temperature change during the Joule-Thomson expansion? a) High pressure and low initial temperature b) low pressure and low initial temperature c) High pressure and high initial temperature d) Low pressure and high initial temperature	K1	CO3
	6	Which law of thermodynamics introduces the concept of entropy? a) Zeroth law b) First law c) second law d) Third law	K2	CO3
4	7	Biot-Savart law is used to calculate a) Electric field due to a point charge b) Magnetic field due to a current carrying conductor c) Magnetic field due to bar magnet d) Electric field due to a electro magnet	K1	CO4
	8	What is the power factor in an AC circuit? a) The ratio of real power to apparent power b) The ratio of apparent power to real power c) The ratio of reactive power to apparent power d) The ratio of real power to reactive power	K2	CO4

Cont...

5	9	In microscope the refractive index is important because it affects a) The color of the image b) The magnification of the image c) The resolution and clarity of the image d) The size of the specimen	K1	CO5
	10	Angle between the incident ray and the emergent of a prism is a) Angle of deviation b) Angle of refraction c) Angle of reflection d) Angle of dispersion	K2	CO5

SECTION - B (35 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Obtain the resultant of two SHM's of equal period when they are acting at right angles to one another.	K3	CO1
		(OR)		
	11.b.	Describe the piezoelectric method of producing ultrasonic waves.		
2	12.a.	Making use of a torsional pendulum how will you find the rigidity modulus of a wire experimentally?	K4	CO2
		(OR)		
	12.b.	Obtain an expression for the excess of pressure inside a spherical soap bubble and a spherical liquid drop.		
3	13.a.	What is Joule-Thomson effect? How it is experimentally established?	K3	CO3
		(OR)		
	13.b.	Discuss the properties of Helium I & II.		
4	14.a.	Show that the electrostatic energy stored in capacitance C charged to a voltage V is $\frac{1}{2}CV^2$	K3	CO4
		(OR)		
	14.b.	Obtain an expression for rms value of AC		
5	15.a.	Explain the significance of refractive index in microscopy.	K3	CO5
		(OR)		
	15.b.	Explain the working of a direct vision prism.		

SECTION -C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Explain Melde's string method to determine the frequency of a tuning fork by transverse and longitudinal modes.	K4	CO1
2	17	Derive Poiseuille's formula for the rate of flow of liquid through a capillary tube.	K4	CO2
3	18	Show that during a reversible process the entropy of the system remains constant.	K3	CO3
4	19	Explain Biot-Savart law and apply it to find the field along the axis of a coil carrying current.	K4	CO4
5	20	Deduce the condition for a prism combination to give dispersion without deviation. Calculate the resultant dispersion	K4	CO5