

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2026
(First Semester)

Branch – **MATHEMATICS / MATHEMATICS WITH COMPUTER APPLICATIONS**

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	The fundamental frequency of a string is directly proportional to the _____. a) length of the string b) square root of the tension c) square root of its linear density d) diameter of the string	K1	CO1
	2	The AC frequency determined using a sonometer usually lies in the range of _____ Hertz. a) 1-10 b) 10-30 c) 40-60 d) 100-200	K2	CO1
2	3	The Young's modulus is defined as the ratio of _____. a) stress to strain b) strain to stress c) force to area d) volume to area	K1	CO2
	4	The dimension formula for surface tension is _____. a) MLT^{-1} b) MT^{-2} c) MLT^{-2} d) ML^2T^{-1}	K2	CO2
3	5	In porous plug experiment, the gas expansion occurs _____. a) reversibly b) isothermally c) adiabatically and irreversibly d) with heat exchange	K1	CO3
	6	Which law introduces the concept of entropy _____. a) zeroth law b) first law c) second law d) third law	K2	CO3
4	7	The energy stored in a charged capacitor is given by $E = \frac{1}{2} CV^2$. a) $\frac{1}{2} CV^2$ b) CV c) C/V d) $\frac{1}{2} C^2V$	K1	CO4
	8	The RMS value of an AC circuit is _____. a) equal to peak value b) greater than peak value c) less than peak value d) zero	K2	CO4
5	9	When light passes through a prism, it is deviated because of _____. a) reflection b) refraction c) diffraction d) scattering	K1	CO5
	10	The main use of a direct vision prism is in _____. a) cameras b) microscopes c) spectroscopes d) telescopes	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.	Discuss on Lissajous figures. Explain the experimental method for obtaining Lissajous figure and also mention their uses.	K2	CO1
		(OR)		
	11.b.	Summarize on the scientific and medical applications of ultrasonic waves.		

Cont...

2	12.a.	Derive an expression for the torque produced per unit twist using torsion in a wire.	K3	CO2
	(OR)			
	12.b.	Express Stoke's law. Derive an expression for the co-efficient of viscosity of a highly viscous liquid.		
3	13.a.	Illustrate on Helium I and Helium II. Draw a graph and explain about Lambda point.	K3	CO3
	(OR)			
	13.b.	Draw the PV diagram and explain the change in entropy in a reversible process of a Carnot's cycle.		
4	14.a.	Illustrate on the loss of energy on sharing of charges between two capacitors in detail.	K3	CO4
	(OR)			
	14.b.	Investigate on the expression for the power factor of an AC circuit.		
5	15.a.	Predict the expression for the dispersive power of the material of a thin prism.	K2	CO5
	(OR)			
	15.b.	Summarize on the construction and use of constant deviation 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	Describe Melde's string method to determine the frequency of an electrically maintained tuning fork by transverse and longitudinal modes.	K2	CO1
2	17	Illustrate on the expression for the rate of flow of liquid in a capillary tube by Poiseuille's formula.	K4	CO2
3	18	Outline on adiabatic demagnetization. How will you employ this phenomenon to produce and measure very low temperatures of a para magnetic substance.	K4	CO3
4	19	Derive an expression for the Magnetic induction of a point on the axis of a circular coil with necessary diagram.	K3	CO4
5	20	Describe the air cell method of determining the refractive index of a liquid.	K2	CO5

Z-Z-Z

END