PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2025
(Fourth Semester)

Common to Branches – **CHEMISTRY & BIOCHEMISTRY**

PHYSICS-II

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 optical path difference in a wedge-shaped film is a) $\mu t \cos(\beta + \gamma)$ b) $2\mu t \cos(\beta + \gamma) + \lambda/2$ c) $2\mu t \cos(\beta + \gamma) - 3\lambda/4$ d) $2\mu t \cos(\beta + \gamma) - \lambda/2$	K1	CO1
	2	X-ray crystallography uses which characteristic of light? a) Polarization b) Interference c) Diffraction d) Coherency	K2	CO1
2	3	The principal quantum number (n) in the hydrogen atom represents: a) Angular momentum b) Energy level c) Spin of the electron d) Magnetic quantum number	K1	CO2
	4	The ground state of the hydrogen atom corresponds to which set of quantum numbers? a) $n = 1, l = 0, m = 0$ b) $n = 1, l = 1, m = 0$ c) $n = 2, l = 0, m = 0$ d) $n = 2, l = 1, m = 0$	K2	CO2
3	5	Heavy nuclei must be such that they can be fissioned by neutrons of energy such substance are called? a) fission fragments. b) fission neutrons c) fission species d) fission element	K1	CO3
	6	_____ is usually expressed in a unit of Nuclear binding energy. a) Mev b) ev c) kev d) Joules	K2	CO3
4	7	For Einstein's relation, $E^2 - p^2c^2 =$ a) m_oc^2 b) m^2c^4 c) m_oc^4 d) m^2c^6	K1	CO4
	8	The Schrodinger wave equation is a mathematical depression describing a) Energy of the electron b) Momentum of the electron c) Position of the electron d) All of the above	K2	CO4
5	9	The Zener diode is used as a) Shunt regulator b) Series regulator c) Rectifiers d) Clamper	K1	CO5
	10	Electro-optical effect is produced in a) LCD b) LED c) OFC d) OLED	K2	CO5

Cont...

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.	Identify the condition $2\mu t\cos(\beta + \gamma) = n\lambda$ for destructive interference in a thin wedge shaped film?	K3	CO1
		(OR)		
	11.b.	Make use of Fresnel diffraction to explain rectilinear propagation of light.		
2	12.a.	Differentiate between the magnetic dipole moment of orbital and spin motion?	K4	CO2
		(OR)		
	12.b.	Bring out the importance of any two quantum numbers.		
3	13.a.	Explain the facts on Shell model of the nucleus.	K5	CO3
		(OR)		
	13.b.	Discuss on the importance of Geiger Muller counter.		
4	14.a.	Explain on Length Contraction.	K6	CO4
		(OR)		
	14.b.	Assess the physical significance of Schrodinger's wave function.		
5	15.a.	Prove the De Morgans theorem with its truth table and figure.	K5	CO5
		(OR)		
	15.b.	Construct the basic gates using discrete components with suitable figure and satisfying truth table.		

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 on the construction of Michelson interferometer and its results.	K3	CO1
2	17	Differentiate the atomic model and vector model of an atom.	K4	CO2
3	18	Classify the types of nuclear fission reactors.	K4	CO3
4	19	Derive Lorentz transformation equations.	K5	CO4
5	20	Explain why NAND gate is called as universal building block.	K5	CO5

Z-Z-Z END