PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2025
(Fourth Semester)

Branch - **PHYSICS**

OPTICS

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	When a lens is corrected to _____ coma. a) Spherical aberraction b) Cylindrical aberraction c) Astimatism d) removal of coma	K1	CO1
	2	A spherical lens which is free from the defects of spherical aberration and coma is called _____. a) Aplanatic points b) Aplanatic lens c) Choromatic aberration d) On the above	K2	CO1
2	3	The Cardinal point of Huygens Eye piece a) 1/f=2/3f b)1/f=3f/2 c)1/f=2f/2 d)1/f=2/f	K1	CO2
	4	An eye –piece is a combination of lenses designed to magnitify the image already formed by the objection of a _____. a) Telescope and microscope b) Spectrometer c) Microscope d) All of the above	K2	CO2
3	5	choose the correct expression for the diameter of dark rings in newton's ring experiment a) D_n^2 =4nR b) D_n^2=2(2n-1)R c) D_n^2 = d) D_n^2	K1	CO3
	6	In Fraunhofer diffraction the incident and diffracted wave fronts are _____. a) Not plane b) Spherical c) Cylinderical d) Plane	K2	CO3
4	7	The angle between plane of polarization and plane of vibration is _____. a) 180° b) 360° c) 90° d) 45°	K1	CO4
	8	Polarimeter is a device used to measure _____ of a substance . a) Polarity of the substance b) Angle of rotation of an optical active compound c) Concentration of the substance d) P_H of the substance	K2	CO4
5	9	The halogram acts somewhat like a simple periodic _____. a) Difftection grating b) Diffraction grating c) Prism d) Interfrance	K1	CO5
	10	A halogarm recorded in this manner is termed as _____. a) Fraunhofer halogram b) Amplitude halogram c) Transmission halogram d) Reflection halogram	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.	Derive abbe's sine condition for refraction at spherical surfaces.	K2	CO1
		(OR)		
	11.b.	Explain Chromatic aberratiom in lenses.	K3	
2	12.a.	Compare Huygens's and Ramsden's eyepiece.	K2	CO2
		(OR)		
	12.b.	Describe the construction of constant deviation spectrometer.	K3	
3	13.a.	Derive an expression for plane diffraction grating..	K3	CO3
		(OR)		
	13.b.	Distinguish between Fresnel's diffraction and fraunhofer diffraction.	K4	
4	14.a.	Give the Huygen's theory of double refraction.	K2	CO4
		(OR)		
	14.b.	Explain the action of a quarter wave plate.	K3	
5	15.a.	Explain optical fibre communication system with a block diagram.	K2	CO5
		(OR)		
	15.b.	List of industrial applications and medical applications of fibre optics.		

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 about Chromatic Aberration in lenses and derive the condition for achromatism of two thin lenses separated by a distance.	K5	CO1
2	17	Derive an expression for the Ramsden's eyepiece.	K5	CO2
3	18	Give the theory of Fraunhoffer diffraction at a single slit.	K3	CO3
4	19	Describe Laurent half shade polarimeter method of determining specific rotator power of a sugar solution.	K3	CO4
5	20	Describe the theory of construction and reconstruction of images using hologram.	K3	CO5

Z-Z-Z END