Reg. No. | | | | | | | | |

G. VENKATASWAMY NAIDU COLLEGE (AUTONOMOUS), KOVILPATTI – 628 502.

UG DEGREE END SEMESTER EXAMINATIONS - APRIL 2025.

(For those admitted in June 2023 and later)

PROGRAMME AND BRANCH: B.Sc., PHYSICS

SEM	CATEGORY	COMPONENT	COURSE CODE	COURSE TITLE
IV	PART-III	CORE-4	U23PH404	OPTICS AND LASER PHYSICS

Date & Session: 28.04.2025/AN **Time : 3 hours** **Maximum: 75 Marks**

Course Outcome	Bloom's K-level	Q. No.	**SECTION – A (10 X 1 = 10 Marks)** **Answer ALL Questions.**
CO1	K1	1.	How do you call the prisms which separate light according to the wavelengths? a) Reflection b) Refraction c) Aberration d) Dispersion
CO1	K2	2.	Identify the type of prism used in prism binoculars. a) partially reflecting right angled prisms b) refracting right angled prisms c) totally reflecting right angled prisms d) none
CO2	K1	3.	Identify the formula through which the diameter of the m^{th} dark ring is calculated. a) 2 times radius of the m^{th} dark ring b) 6 times radius of the m^{th} dark ring c) 4 times radius of the m^{th} dark ring d) 8 times radius of the m^{th} dark ring
CO2	K2	4.	Infer the distance between successive dark fringes a) fringe width. b) energy gap c) phase space d) dark fringe
CO3	K1	5.	If the source and screen are at finite distance then the type of diffraction is called a) Fresnel diffraction b) zone plate c) Fraunhoffer diffraction d) circular aperture
CO3	K2	6.	Diffraction fringes are of a) same width b) different width c) circular fringes d) equal fringes
CO4	K1	7.	Identify the odd one a) Sun glasses b) photography c) optical microscopy d) tyre
CO4	K2	8.	The numerical aperture is defined as the a) sine of the acceptance angle b) sine of the diffracted angle c) cosine of the acceptance angle d) cosine of the diffracted angle
CO5	K1	9.	LASER stands for a) Light Amplification through Stimulated Erosion of Radiation b) Light Amplification by Stimulated Emission of Radiation c) Light Amplifier through Stimulated Erosion of Radiation d) Light Amplifier through Stimulated Emission of Radiation
CO5	K2	10.	Holography is a a) one step process b) two step process c) three step process d) four step process

Course Outcome	Bloom's K-level	Q. No.	**SECTION – B (5 X 5 = 25 Marks)** **Answer ALL Questions choosing either (a) or (b)**
CO1	K3	11a.	Interpret the similarities and differences between Ramsden and Huygens Eyepiece
CO1	K3	11b.	**(OR)** Predict what would happen if a lens gets affected with spherical aberration.
CO2	K3	12a.	Illustrate the conditions for interference
CO2	K3	12b.	**(OR)** With neat diagram explain the interference due to reflected light
CO3	K4	13a.	Distinguish between Fresnel and Fraunhofer diffraction
CO3	K4	13b.	**(OR)** Analyse the concept of zone plates with neat diagram
CO4	K4	14a.	Clarify how a Nicol prism be used as a polariser and analyser
CO4	K4	14b.	**(OR)** Explain the principles of optical fibres
CO5	K5	15a.	Discuss what are spontaneous and stimulated emissions
CO5	K5	15b.	**(OR)** Explain what is holography and discuss its applications

Course Outcome	Bloom's K-level	Q. No.	**SECTION – C (5 X 8 = 40 Marks)** **Answer ALL Questions choosing either (a) or (b)**
CO1	K3	16a.	Mention the main objective of a high power microscope and explain the oil immersion objective of high power microscope.
CO1	K3	16b.	**(OR)** With neat diagram explain the aplanatic points of a lens
CO2	K4	17a.	Illustrate the concept and working of Michaelson's interferometer
CO2	K4	17b.	**(OR)** Explain how an air wedge can be created and its working
CO3	K4	18a.	Analyse the concept of plane diffraction grating
CO3	K4	18b.	(OR) Elaborate the resolving power of a prism and grating with neat diagrams
CO4	K5	19a.	Discuss about quarter and half wave plates
CO4	K5	19b.	**(OR)** Explain the concept of multimode step index fibres
CO5	K5	20a.	Explain the principle and working of CO_2 laser
CO5	K5	20b.	**(OR)** Elaborate the concept of population inversion and optical pumping