COURSE CODE(CREDITS): 25B11PH111 (4) MAX. MARKS: 25

COURSE NAME: Physics I MAX. TIME: 1 Hour 30 Minutes

COURSE INSTRUCTORS:PBB,SKK,VSA,HAZ,SKT,SBA,HSR

Note:Note:(a)All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	CO	Marks
Q1	Draw the intensity distribution of diffraction pattern due to single slit. Graphically calculate the intensity ratio of first and second maxima.	1	4
Q2	A diffraction grating used at normal incidence gives a line $\lambda_1 = 6000$ A^0 in a certain order is superimposed on another line $\lambda_2 = 4500$ A^0 of the next higher order. If the angle of diffraction is 30^0, calculate the number of lines in 1 cm of the grating.	2	4
Q3	(a) The ratio of intensities of two waves that produce interference pattern is 16:1. Deduce the ratio of maximum to the minimum intensities in fringe system.	3	2
	(b)Light of wavelength 5893 A^0 is reflected at normal incidence from a soap film of refractive index 1.42. What is the least thickness of the film that will appear (i) bright and (ii) dark		2
Q4	(a) Light source emitting the light of wavelength $\lambda_1 = 600$ nm, and $\lambda_2 = 480$ nm is used to obtain Newton's ring. It is found that the nth dark ring of λ_1 coincides with $(n+1)^{th}$ dark ring of λ_2. If the radius of curvature of the curved surface of lens is 96 cm. Calculate the diameter of $(n+1)^{th}$ dark ring of λ_2.	4	3
	(b) Show that diameter of the dark fringes is proportional to the square root of odd natural numbers.		2
Q5	(a) Prove that the intensity of the transmitted polarized light becomes half when a natural light of intensity I_0 is incident on a polarizer.	2	2
	(b) An incident light is plane-polarized with its electric field making an angle of 30° with the axis of the polarizer. What will be the intensity of the light transmitted from the polarizer?		2
Q6	(a) Describe the propagation of polarized light in Quarter –Wave plate and derive the thickness of the Quarter-wave plate.	3	2
	(b) What should be the thickness of a quarter-wave plate for a light of wavelength 5890Å if the refractive indices for extraordinary μ_e and ordinary μ_o rays are 1.553 and 1.544, respectively?		2