DR. AKHILESH DAS GUPTA INSTITUTE OF TECHNOLOGY & MANAGEMENT

NEW DELHI

CLASS TEST FEB-2023 (SET-A)

PAPER CODE- BS 105

SUBJECT: APPLIED PHYSICS I

TIME 1.5 Hrs.

MAX. MARKS: - 30

Note: Attempt Q. No 1 which is compulsory and any two questions from remaining.

	Questions	Max. Marks	CO(s)
1.a	In Newton's rings experiment the diameter of 4th and 12th rings are 0.4 cm and 0.7 cm respectively. Find wavelength of light used. Radius of curvature of planoconvex lens is 2m.	2	3
b	Differentiate between Fresnel and Fraunhofer diffraction	2	3
c	The velocity of light in water is 2.2×10^8 m/s. Calculate the angle of polarization.	2	3
d	At what speed will an object of length 100cm be measured as 50cm an observer at rest.	2	4
e	Define Population inversion and Pumping	2	4
2.a	Interpret the phenomenon of interference of light in thin film and obtain the condition of maxima and minima in reflected system.	5	3
b	A biprism is placed at distance of 5cm from slit illuminated by sodium light of wavelength 5890 A°. Find the width of fringes observed in eyepiece at a distance of 75cm from biprism, given the distance between virtual sources is 0.005cm.	3	3
c	Explain why a compensating plate is needed in Michelson's Interferometer.	2	3
3.a	Find relation between Einstein's Coefficients A and B.	5	4
b	Explain the principle, construction and working of a Laurent's half shade polarimeter.	5	3
4.a	Explain the basic postulates of Einstein's special theory of relativity. Derive Lorentz space-time transformation formula.	5	4
b	What is total energy of a 2.5 MeV electron?	3	4
c	Give the experimental verification of time dilation.	2	4