Roll No. 22GIT-E-24

GLOBAL INSTITUTE OF TECHNOLOGY

B. Tech. I Semester I Midterm Exam 2022

1FY2-02 Engineering Physics

Branch: All Branches (Common for C, D & E)

23/12/22/ Friday

Time: 3 Hours **Maximum Marks: 70**

Attempt all questions

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. **No supplementary sheet shall be issued in any case.**

Part A (Answer should be given up to 25 words only)
All questions are compulsory

Q.1 Define the Coherent sources. (CO1)
Q.2 What is meant by interference of light. (CO1)
Q.3 What is Newton's ring? (CO1)
Q.4 Why Newton's Rings are circular? (CO1)
Q.5 What are the conditions for sustained interference? (CO2)
Q.6 State Rayleigh's criterion of resolution. (CO2)
Q.7 Enumerate the difference between Fresnel and Fraunhofer diffraction (CO2)
Q.8 Define resolving power of an optical instrument. (CO2)
Q.9 Define wave front and its types. (CO1)
Q.10 write the condition for maxima & minima in Young's double slit experiment (CO1) ***10X2=20***

Part B Analytical/Problem solving questions
Attempt all questions (word Limit 100)

Q.1 *Two coherent sources whose intensity ratio is* 100:1 produces interference fringes. Deduce the ratio *of maximum intensity to minimum intensity in* fringe system. (CO2)

Q.2 *In a Michelson interferometer, when 100* fringes were shifted, the final reading of the screw was *found to be 10.735 mm. If the wavelength of the light was 592 x* 10^{-5}cm, what was the initial reading of the screw? (CO2)

Q.3. A diffraction grating used at normal incidence gives a line λ_1=600Å in a certain order superimposed on another line λ_2=450Å of the next higher order. If the angle of diffraction is 30 degree how many lines are there in 1 cm of the grating? (CO2)

Q.4.Describe the construction of a plane transmission diffraction grating and explain the formation of spectra? (CO1)

Q.5 In grating spectrum explain the following- (CO1)
(i) Absent spectrum (ii) width of principal maxima **5 x 4 =20**

Part C (Descriptive/Analytical/Problem Solving/Design Question)
Attempt all questions

Q.1 Discuss Fraunhofer diffraction due to a single slit. Derive the expression for the intensity distribution for the same. (CO1)

Q.2 Explain the formation of newton rings in reflected light. Prove that the diameters of the bright fringe are proportional to the square root of odd natural numbers. (CO2)

Q.3 What is plane transmission grating? Derive a relation for the intensity of light diffracted from a plane transmission grating. (CO1)

3 x 10 =30