JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -II EXAMINATION- OCT. 2019
B.Tech. I Semester (CSE, ECE, IT, CE)

COURSE CODE: 18B11PH111

COURSE NAME: ENGINEERING PHYSICS-I

COURSE CREDITS: 04

MAX. MARKS: 25

MAX. TIME: 1.5 Hrs

Note: All questions are compulsory and carry equal marks. Carrying of mobile phone during examinations will be treated as case of unfair means. Attempt all the questions in sequence. Scientific calculator is allowed.

1. Two plane glass surfaces in contact along one edge are separated on the opposite edge by a thin wire. If 20 interference fringes are observed between these edges in Na light (589 nm) of normal incidence, what is the thickness of the wire? **[CO-2]**

2. On introducing the thin sheet of mica of thickness 1.2 μm in the path of the one of the interfering beam in biprism experiment the central fringe is shifted through a distance equal to the spacing between the two successive bright fringes. Calculate refractive index of mica if $\lambda = 6 \times 10^{-7}$ m. **[CO-2]**

3. Derive an expression for resolving power of a transmission grating. **[CO-1]**

4. Two parallel slits having width 0.19 mm are separated by 0.41 mm. The slits are illuminated by light of wavelength 650 nm, the diffracted light is focused at a distance of 120 cm. Calculate the position of first maxima and minima. **[CO-2]**

5. What is meant by birefringence? Draw the diagram of Nicol prism and discuss its working. **[CO-1]**

6. Two Nicols are so arranged that the amount of light transmitted through them is maximum. What will be the percentage reduction in the intensity of incident light when an analyzer is rotated by (i) 0°, (ii) 45°, (iii) 60°. **[CO-2]**

7. Using diagram, how will you generate elliptically polarized light and distinguish it from partially polarized light. **[CO-1]**

8. What is population inversion? Describe the construction and working of He-Ne LASER using diagram. **[CO-4]**

9. Give the components of a LASER and discus the principle and working of 3-level LASER system. **[CO-4]**

10. What is meant by spectroscopic term? Write down quantum number for states (i) $^2D_{3/2}$, (ii) $^2F_{5/2}$. **[CO-5]**