

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-1 (Sept-2019)

B.Tech I Semester (BI/BT)

COURSE CODE: 18B11PH112

MAXIMUM MARKS: 15

COURSE NAME: Basic Engineering Physics-1

COURSE CREDITS: 4

TIME ALLOWED: 1HR

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Attempt all the questions in sequence.

1. What are Coherent Sources? How they are useful for explaining the concept of sustained interference. [2]
2. Using Young's Double Slit Experiment, prove that the fringe width β is given as $\beta = \frac{\lambda D}{a}$
Where λ is the operating wavelength, D is distance between source and screen and a is the distance between the sources. [4]
3. Draw a geometric ray diagram of interference by reflection using thin films. The angle of incidence of light is 30 degree, thickness of film is one centimeter and refractive index of 1.5. Calculate the total physical path difference in centimeters from the geometric ray diagram. [2+1]
4. A biprism forms interference fringes with monochromatic light of wavelength 5890 Å. On introducing a thin glass plate ($\mu = 1.3$) in the path of one of the interfering beams, the central fringe shifts to the position previously occupied by the fifth bright fringe. Find the thickness of the glass plate. [2]
5. Two slits in Young's experiment have widths in the ratio 1:25. Deduce the ratio of intensities at the maxima and minima in the pattern. [1.5]
6. A biprism is placed 5 cm away from a slit illuminated by sodium light of wavelength 5890 Å. The width of the fringes obtained on screen 75 cm from the biprism is 0.9424 mm, calculate the distance between two coherent sources? [2.5]