JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- SEPTEMBER 2017

B.Tech I Semester (CSE, ECE, CE, IT)

COURSE CODE: 10B11PH111   MAX. MARKS: 15

COURSE NAME: PHYSICS-I

COURSE CREDITS: 04   MAX. TIME: One Hr

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

Q1. Discuss the formation of Newton's rings by reflected light. Describe the experimental arrangement using a schematic diagram. Why Newton's rings are circular? **[4 Marks]**

Q2. (a) Explain the Fraunhofer class of diffraction, Find the missing orders in a double slit diffraction pattern if (i) $b = a$, (ii) $b = 2a$; where 'a' is the slit width and 'b' is the width of the opaque portion. **[2 Marks]**

(b) Show that the maximum value of resolving power of a grating $= nN$, where n is the order of the principal maximum and N is total number of lines on the grating surface. **[2 Marks]**

Q3. (a) Light of wavelength *600 nm* falls normally on a thin wedge shaped film of refractive index *1.4* forming fringes that are *2.0 mm* apart. Find the angle of wedge. **[2 Marks]**

(b) On introducing a thin sheet of mica of thickness *1.2 μm* in the path of one of the interfering beams, in a biprism experiment, the central fringe is shifted through a distance equal to the spacing between bright fringes. Calculate the refractive index of mica *(λ=600 nm)*. **[2 Marks]**

Q4. A lens whose focal length is 40 cm forms a Fraunhofer diffraction pattern of a slit having *0.3 mm* width. Calculate the distance of the first dark band and the next bright band from the axis if sodium light is used as a source *(λ = 589 nm)*. **[3 Marks]**

PH—1, BT