Prof P.B.Barman.

Enrolment Number: .....

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- September 2016

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

COURSE CODE: 10B11PH111 MAX. MARKS: 15

COURSE NAME: PHYSICS-I

COURSE CREDITS: 04 MAX. TIME: 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.*

Q1.

a) Explain the effect of thin glass plate of thickness t and refractive index μ in the path of one of the interfering beams in the biprism experiment. Calculate the displacement of fringes. **[3]**

b) Two narrow and parallel slits *0.1 cm* apart are illuminated with Sodium light of wavelengths *589.3 nm*. The interference pattern is observed at a distance of *25 cm* from the slits. Calculate the fringe width. If a thin sheet of transparent material of thickness $7.2\mu m$ is introduced in the path of one of the interfering beams, the central fringe shifts to a position occupied by the 6^{th} bright fringe. Calculate the refractive index of the film. **[2]**

Q2.

a) Describe the experimental arrangement and give the necessary theory of formation of Newton's rings by reflected light. Why Newton's are rings circular. **[3]**

b) A soap film of refractive index *1.333* is illuminate by white light incident at an angle of 45^o. The light transmitted by it is examined by a spectroscope and two consecutive bright bands are focused corresponding to wavelength *610 nm* and *600 nm*. Find the thickness of the film. **[2]**

Q3.

a) Discuss Fraunhofer diffraction pattern due to a single slit. Derive the conditions for production of maxima and minima and state their position. Find the expression for width of the central maximum. What happens when the width of the slit is gradually increased? **[3]**

b) A *550 nm* light falls normally on a slit of width *2.2 μm*. Determine the angular position of second and third minima. **[2]**