0 3 DEC 2018

NATIONAL INSTITUTE OF TECHNOLOGY, KURUKSHETRA
THEORY EXAMINATION
Question paper (Re-appear)

Month and year of the examination: Nov/Dec, 2018
Programme: B.Tech Semester.....First
Subject...Physics-I (Old Scheme) Course No. PHY111T/PHT-105
Maximum Marks.....50 No. of Questions to be Attempted.....05
Time Allowed.....3 Hrs Total No. of Questions.....08
Total No of pages used.....01

Unless stated otherwise, the symbols have their usual meanings in context with the subject. Assume suitably and state, additional data required, if any.
The Candidates, before starting to write the solutions, should please check the Question paper for any discrepancy, and also ensure that they have been delivered the question paper of right course no. and right subject title.

Q.1 Describe the principle, construction and working of Michelson's interferometer to find the thickness of a thin transparent plate. **[10]**

Q.2 (a) Discuss theory of plane transmission grating and derive conditions for secondary maxima and minima. **[7]**
(b) Distinguish between Fresnel's and Fraunhoffer's type of diffraction. **[3]**

Q.3 (a) Explain half and quarter wave plate. Give the theory and construction of Laurent's half shade polarimeter. **[6]**
(b) What is double refraction? How Nicol prism polarizes and analyses the light? **[4]**

Q.4. (a) What is dielectric polarization and electric displacement vector? Explain the behaviour of dielectric in an alternating field. **[6]**
(b) What are dielectric losses? Why does it occur? **[4]**

Q.5 (a) Derive time dependent Schrodinger equation and give its physical significance. **[5]**
(b) What are the difficulties with classical physics? Distinguish between phase velocity and group velocity. **[5]**

Q.6 (a) What is Moseley's law? Give its importance. **[4]**
(b) What is the origin of X-rays? Differentiate between continuous and characteristic X-ray spectra. **[6]**

Q.7 (a) Describe Michelson- Morley Experiment and discuss its negative results. **[5]**
(b) Explain the postulates of special theory of relativity and derive mass energy relation. **[5]**

Q.8 (a) Explain the principle construction and working of G.M counter. **[5]**
(b) Distinguish between nuclear fission and nuclear fusion process. Explain the function of the moderator in nuclear reactor. **[5]**
