Roll No. .....

1983

B. E. (1st Semester)

Examination – December, 2011

PHYSICS - I

Paper : PHY- 101 - E

Time : Three hours] *[Maximum Marks : 100*

Before answering the question, candidates should ensure that they have been supplied the correct and complete question paper. No complain in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting at least *two* questions from each Part.

PART – A

1. (a) Give the construction and theory of Fresnel's biprism. Discuss in detail how you would determine the wavelength of light by biprism ? 15

(b) In a Newton's ring experiment the diameter of the 5th and 25th rings are 0.3 cm & 0.8 cm respectively. Find the wavelength of the light when R = 100 cm. 5

2. (a) Give the construction and theory of a plane transmission grating and explain the formation of spectra by it. 15

(b) What is the highest order spectrum which may be seen with monochromatio light of wavelength 600A by means of a diffraction grating with 5000 lines/cm. 5

3. (a) Describe a Nichol's prism and show how it can be used for the study of polarization of light. 10

(b) Give the construction & working of Lorentz half shade Polari meter. What are its main drawbacks ? 10

4. (a) Describe in detail characteristics of a laser beam. 12

(b) What is an optical fiber ? Explain the terms acceptance angle and numerical aperture. 8

PART – B

5. State and explain Maxwell's equations. Give analysis of propagation of em waves in dielectric media. 20

6. (a) Derive an expression for the dependence of relativistic mass on velocity. 15

(b) Derive the mass energy equivalence relation. 5

7. (a) State and prove Gauss Law in dielectrics. 10

(b) Derive an expression for energy stored in dielectric in electrostatic field. 10

8. Write short note on : 10 + 10 = 20

(a) Scintillation Counter,

(b) Ionization Chamber.