Printed Pages : 2

AS-102

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 199102

Roll No.

B.Tech.

(SEM. I) (ODD SEM.) THEORY EXAMINATION, 2014-15

ENGINEERING PHYSICS-I

Time : **3** Hours] [Total Marks : **80**

Note: Attempt all questions. Each question carries equal marks. Assume standard data wherever required.

1. Attempt any two parts from the following. **8×2=16**

(a) What are frame of references? Explain inertial and non inertial frame of reference with suitable example.

(b) Verify the statement that no particle can attain a velocity larger than velocity of light.

(c) The total energy of a moving meson is exactly twice its rest energy. Find the speed of the meson.

2. Attempt any two parts from the following. **8×2=16**

(a) What do you understand by displacement current? Why and how Maxwell modified Amperes law.

(b) What is Poynting vector? Write down Poynting theorem and explain its physical significance.

(c) State and prove Stokes theorem.

3. Attempt any two parts from the following. **8×2=16**

(a) Explain the phenomenon of interference in thin films due to reflected light.

(b) What do you understand by resolving power? Deduce the expression for the resolving power of grating.

(c) A plane grating has 15000 lines per inch. Find the angle of separation of the 5048A° and 5016A° lines of helium in the second order spectrum.

4. Attempt any two parts from the following. **8×2=16**

(a) Give the construction and working of a Nicol prism.

(b) Explain the construction and working of He-Ne laser.

(c) Find the thickness of a quarter wave plate for the wavelength of light of 5890 A°. The refractive indices for ordinary and extraordinary rays are 1.55 and 1.54 respectively.

5. Attempt any two parts from the following. **8×2=16**

(a) What is optical fiber? Explain acceptance angle, acceptance cone and numerical aperture.

(b) Explain the construction and reconstruction of image in holography.

(c) An optical fiber of length 150 m has input of 10 micro watt and output power of 9 micro watt. Compute loss in dB/km.