PH-101/1843

B. Tech. (Semester-I) Examination-2014

Engineering Physics

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

Note: Attempt questions from all the sections.

Section-A

(Short Answer Type Questions)

Note: Attempt any ten questions. Each question carries 4 marks **(4x10=40)**

1. Calculate the velocity of a watch when it seems to be slowed down by one minute in one hour.

2. Derive an expression for velocity addition relativesticaly.

3. Establish Einstein's mass energy relation.

4. Explain inertial and non-inertial frame of references and describe a laboratory at rest on earth's surface belong to which frame.

5. A silica glass optical fibre has a core refractive index 1.50 and cladding refractive index of 1.450. Calculate numerical aperture of the fiber.

6. Explain attenuation in brief.

7. Explain the working of Ruby laser.

8. Describe important applications of lasers.

9. A light of wavelength 6000Å falls normally on a straight slit of width 0.10 mm. Calculate width of central maxima, when observed on screen placed one meter away.

10. Describe Fresnel's Theory of optical activity.

11. Explain basic principle of optical fiber and their classification based on refractive index.

12. Calculate momentum of moving electron with mass 8 times of its rest mass.

13. Discuss the phenomena of dispersion in optical fibre.

14. Explain Rayleigh's criteria for resolving power.

15. Explain Biprism experent for finding wavelength of monochromatic source.

Section-B

(Long Answer Type Questions)

Note: Attempt any three questions. Each question carries equal marks. (20x3=60)

1. What was the objective of conducting the Michelson Mosley experiment? Describe the experiment and interpret negative result.

2. Derive expression for Einstein coefficients and deduce main conditions for laser action.

3. Describe the production and analysis of plane, circular and elliptical polarized light.

4. Explain the double refraction phenomena. Give the theory and construction of nicol prism and uses also.

5. Describe the theory of Newton's ring and derive an expression for wavelength refractive index for this experiment.

6. Write short notes on any two of followings:
   (a) Holography
   (b) Signal losses in optical fiber
   (c) Lorentz transformation equations
   (d) Diffraction Grating