Printed Pages : 4 | 756 | AS-102

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

Paper ID : 199112 | Roll No. | | | | | | | | | |

B. Tech.

(SEM. I) THEORY EXAMINATION, 2015-16

ENGINEERING PHYSICS - I

[Time:3 hours] [Maximum Marks : 100]

Note : Attempt **All** Sections.

SECTION - A

1. Attempt **all** parts. All parts carry equal marks. Write answer of each part in short. (2x10=20)

   (a) What is non-intertial frame of reference ?

   (b) What is massless particle ?

   (c) Write the main condition for sustained interference.

   (d) Show the intensity ratio of mass I_{mid}/I_{max} for resolution limit.

   (e) What is resolving power of grating ?

   (f) What do you mean by optic axis ?

2. What was the objective of conducting the Michelson-Morley experiment ? Describe the experiment. How is the negative result of the experiment interpreted ?

3. What is proper length ? Derive the expression for it. Calculate the percentage contraction of a rod moving with speed 0.8c in direction inclined at 60° of its own length.

4. Explain the folrmation of interference fringes by means of a Fresnel's biprism and derive the expression for the fringe width. In a biprism experiment, the distance between the slit and the screen is 180 cm. The biprism 60 cm away from the slit and its refractive index is 1.5. When a source of wavelength 5890Å is used, the fringe width is found to be 0.012 cm. Find the angle between the two refracting surface of the biprism.

working of Laurent's half-shade polarimeter. Calculate specific rotation if the plane of polarization is turned through 25.4°, travelling 25 cm length of 22% sugar solution.

7. Describe the principle and working of Ruby laser syatem. Compare it with He-Ne-laser.

8. Discuss the phenomena of attenuation and dispersion in optical fibre.

9. What is holography ? Explain the principle of holography using construction and reconstruction of images.

SECTION - C

Attempt **any two** questions from this section : (15x2=30)

10. (a) Show that the relativistic invariance of the law of conservation of momentum leads to the concept of variation of mass with velocity.

experiment. Deduce an expression for thickness of plate.

(b) What do you understand by missing order spectrum? What particular spectra would be absent if the width of transparencies twice of opacites ?

(c) Two plane glass surfaces in contact along one edge are separated at the opposite edge by a thin wire. If 25 interference fringes are observed between these edges in sodium light of wavelength $\lambda = 5898\text{Å}$ of normal incidence, then find the thickness of the wire.

(a) Discuss construction and working of Nicol prism.

(b) What are Einstein's coefficients of emission ? Establish relation between them.

(c) Determine core radius necessary for single mode operation at 0.85μm of step index fibre with $\mu_1 = 1.485$ and $\mu_2 = 1.479$. What are the numerical

Planck's Constant, $h = 6.63 \times 10^{-34}$ J/s

Charge on electron, $e = 1.6 \times 10^{-19}$ C

Boltzmann's Constant, $k = 1.38 \times 10^{-23}\ m^2kgs^{-2}K^{-1}$

—x—