Printed Pages : 4

EAS-101

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

PAPER ID : 199107

Roll No.

B. Tech.

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

ENGINEERING PHYSICS-I

Time : **2** Hours] [Total Marks : **50**

Note : There are three A, B and C sections in this paper. Questions are to be done from all three sections.

SECTION-A

1 Attempt all parts. Give answer of each part in short. **2×5=10**

(a) What is difference between inertial and non-inertial frames of reference?

(b) What are coherent sources?

(c) How the diffraction pattern modified when single slit is replaced by double slit?

(d) How a circular polarized light can be changed in to plane polarized light?

(e) Why graded index fiber is better than multimode step index fiber?

SECTION-B

2 Attempt any three parts. All parts carry equal marks. **5×3=15**

(a) The mass of a moving electron is eleven times its rest mass. Find its kinetic energy and momentum.

(b) The central fringe of the interference produced by light wavelength 6000 A° is shifted to the position of 5^{th} bright fringe by introducing a thin glass plate of refractive index 1.5. Calculate the thickness of the plate.

(c) In a grating spectrum, which spectral line in 4^{th} order will overlap with 3^{rd} order line of 5461 A°?

(d) The value of μ_e and μ_o for quartz are 1.5508 and 1.5418 respectively. Calculate the phase retardation for λ=5000A° when the plate thickness is 0.032 mm.

(e) The optical power, after propagation through a fiber that is 500 m long is reduced to 25% of its original value. Calculate the fiber loss in dB/km.

SECTION-C

Note : Attempt all questions of this section. All questions carry equal marks.

3 Attempt any one part of the following : **1×5=5**

(a) What was the objective of Michelson Morley experiment? Discuss the results of this experiment.

(b) What is mass-energy equivalence? Show that for small velocities the relativistic kinetic energy reduces to the classical energy.

4 Attempt any one part of the following : **5×1=5**

(a) Explain the formation of interference fringes by means of fresnels biprism. What happened when a transparent mica sheet is introduced in one of the interfering beams?

(b) Describe the formation of Newton's rings in reflected light. Explain briefly why Newtons rings are circular.

5 Attempt any one part of the following : **1×5=5**

(a) Explain the intensity distribution due to Fraunhofer diffraction at single slit.

(b) What do you understand by missing orders? Which order will be missing if opacities are thrice the transparencies?

6 Attempt any one part of the following : **5×1=5**

(a) Show that plane polarized and circularly polarized light are the special cases of elliptically polarized light?

(b) Draw a neat transition level diagram of He-Ne laser and describe its method of working.

7 Attempt any one part of the following : **5×1=5**

(a) Explain basic principle of an optical fiber. Discuss fiber classification.

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