Dec.-2?-0109

PH-101 (Engineering Physics)

B. Tech. 2nd (CBCS)

Time : 3 Hours
Max. Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all, selecting one question from each section A, B, C and D. Section E is compulsory.

SECTION - A

1. Describe Micheson-Morley's experiment and show how the negative results obtained from these are interpreted. Justify the Importance of this experiment in the development of the theory of relativity. (10)

2. (i) Write Lorentz transformation equations. (3)

   (ii) What are the differences between spontaneous and stimulated emission. Describe the working of a Ruby LASER. (7)

SECTION - B

3. What do you mean by damped oscillations? Obtain a differential equation of damped oscillator and solve it. (10)

4. What are the types of optical fibers? Mention the advantages of optical fiber communication. (10)

SECTION - C

5. Derive time dependent Schrodinger wave equation. Give the physical significance of the wave function. (10)

6. (i) What is de-Broglie wavelength of electron of energy 120 eV. (3)

   (ii) Write a note on X-ray production and its type. (7)

SECTION - D

7. (i) Write down Maxwell's equations in differential and integral form for time varying fields. (5)

   (ii) Explain briefly, how an electromagnetic wave propagates in linear media? (5)

8. What do you mean by superconductivity? What are chief characteristics of superconducting state? Give the applications of superconductors. (10)

SECTION - E (Compulsory)

9. (i) Give the postulates of special theory of relativity.

   (ii) Write a brief not on length contraction.

   (iii) Give the applications/uses of LASER.

   (iv) What is population inversion?

   (v) Explain the concept of resonance.

   (vi) What do you mean by numerical aperture in fiber optics?

   (vii) State and explain Heisenberg's uncertainty principle.

   (viii) Write brief note on longitudinal and transverse waves.

   (ix) What are Type-I and Type-II superconductor?

   (x) What is attenuation in optical fibers and explain losses? (10×2=20)