(b) Explain the concept of displacement current. How it led to the modification of Ampere's law?

(c) Discuss fibre classification.

6. (a) Derive mass-energy relation. Give some evidence showing its validity.

(b) Obtain the relativistic formula for addition of velocities. Also show that it is consistent with Einstein's second postulate.

(c) Explain why a moving clock appears to go slow to a stationary observer?

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No. of Printed Pages : 04

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

PAPER ID : 49902 Roll No.

B.Tech. Examination, September 2024

(Special Carry Over Paper)

ENGINEERING PHYSICS

Time : Three Hours] *[Maximum Marks : 60*

Note :– Attempt all questions.

SECTION–A

1. Attempt all parts of the following : 8×1=8

(a) Two independent sources could not produce interference, why?

(b) What do you mean by grating element?

(c) What is optic axis?

(d) What are the outcomes of Lave's experiment?

(e) What is Photon?

(f) Write equation of continuity.

(g) What is the basic principle of optical fibre?

(h) What are inertial and non-inertial frame of references?

SECTION – B

2. Attempt any two parts of the following : 2×6=12

(a) Calculate the minimum number of lines in a grating which will just resolve the lines of wavelength 5890 Å and 5896 Å in the second order.

(b) Calculate De-Broglie wavelength of neutron of energy 12.8 MeV.

(c) Assuming that all the energy from a 1000 watt lamp is radiated uniformly, calculate the average values of intensities of electric and magnetic fields of radiation at a distance of 2m from the lamp.

(d) A particle of rest mass m_0 moves with speed $C/\sqrt{2}$. Calculate its mass, momentum and kinetic energy.

SECTION – C

Note :– Attempt all questions. Attempt any two parts from each questions. 8×5=40

3. (a) What are Newton's rings? Prove that in reflected light, diameter of the dark ring is proportional to the square root of natural numbers.

(b) Define resolving power. Derive an expression for the resolving power of grating.

(c) Describe cosntruction and working of Laurent's half shade polarimeter.

4. (a) Derive time independent Schrodinger wave equation.

(b) What is Heisenberg uncertainty principle? Apply this to calculate binding energy of electron in an atom.

(c) What is Bragg's law? Describe Bragg's spectrometer.

5. (a) What is Poynting vector? Derive Poynting theorem.