B.Tech. (Sem. - 1st/2nd)
ENGINEERING PHYSICS
SUBJECT CODE : PH - 101 (2K4 & Onwards)
Paper ID : [A0113]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours   Maximum Marks : 60

Instruction to Candidates:

1) Section - A is **Compulsory**.

2) Attempt any **Five** questions from Section - B & C.

3) Select atleast **Two** questions from Section - B & C.

Section - A

Q1)   *(Marks : 2 Each)*

a) Explain the term length contraction?

b) What is the wavelength of CO_2 Laser, Ruby Laser?

c) Explain E.M.F., Electric Field.

d) Define N.A., Acceptance Angle.

e) Define the process of doping in semiconductors.

f) Write down the relation of critical field with critical temp. in superconductors.

g) Define population inversion in LASERS.

h) Differentiate between inertial and non inertial frames of reference.

i) Plot the graphs for type-I and type-II superconductors.

j) Define Eigen values and Eigen functions.

Section - B

(Marks : 8 Each)

Q2) Derive the relations for Maxwell's equations.

Q3) (a) Calculate the expression for N.A. for OFC's.

(b) A step index fiber has a normalized frequency=26.6 at 1300nm wavelength. If core is 50 μm thick calculate the acceptance angle of the fiber.

Q4) (a) Explain the working, construction and energy level diagram for He-Ne laser.

(b) Explain the term spiking in Ruby laser.

Q5) Explain what are Ferrites? Mention some applications of Ferrite materials.

Section - C

(Marks : 8 Each)

Q6) (a) Derive the expression for Lorentz's Transformation equations.

(b) Prove that velocity of light is independent from the velocity of frame of reference.

Q7) (a) Differentiate between Continuous and Characteristic X-Rays.

(b) Define Wave Function and calculate the expression for Time Independent Schrodinger Wave Equation.

Q8) Explain Compton Effect and calculate the expression for Compton Shift.

Q9) Derive & explain the London equations and calculate the expression for penetration depth.