

Roll No.

Total No. of Questions : 09]

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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 CO₂ 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.

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P.T.O.

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.

