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6 SEM TDC PHYH (CBCS) C 13

2025

(May)

PHYSICS

(Core)

Paper : C–13

(Electromagnetic Theory)

Full Marks : 53

Pass Marks : 21

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Choose the correct option of any *five* of the following : 1×5=5

(a) Maxwell's equations give the relations between

(i) different sources

(ii) different boundary conditions

(iii) different fields

(iv) None of the above

(b) Poynting vector represents

(i) the rate of flux change per unit area

(ii) the rate of energy transfer per unit area

(iii) electric field per unit area

(iv) magnetic field per unit area

(c) For good conductor, skin depth

(i) increases with increasing frequency

(ii) decreases with increasing frequency

(iii) is independent of frequency

(iv) None of the above

(d) Brewstar angle is the angle when a wave is incident on the surface of a perfect dielectric at which there is no reflected wave and the incident wave is

(i) parallelly polarized

(ii) perpendicularly polarized

(iii) normally polarized

(iv) None of the above

(e) The magnitudes of E_x and E_y components are same in which type of polarization?

(i) Linear

(ii) Circular

(iii) Elliptical

(iv) Perpendicular

(f) The dominant TE mode in rectangular waveguide is

(i) TE_{01}

(ii) TE_{00}

(iii) TE_{10}

(iv) TE_{11}

2. Answer any *five* of the following questions : 2×5=10

(a) Write down the Maxwell's field equations in linear isotropic media.

(b) State the physical concept of electro-magnetic field energy density.

(c) What is 'relaxation time'?

(d) Explain the significance of $\nabla \cdot \vec{B} = 0$.

8. Draw the structure of an optical fibre with different parts and state the role of each part. What is the principle involved in its working? 2+1=3

Or

Describe with relevant sketches the different types of fibres. Also compare them. 3

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