

F.Y. M.Sc. (Physics) (CBCS Pattern) Second Semester CBCS
PSCPHYT08 - Core-8 - Electrodynamics-II Paper-8

P. Pages : 2

Time : Three Hours



GUG/W/18/11223

Max. Marks : 80

1. Either:

- a) What is polarization of wave? Explain linearly polarised and circularly polarised wave. 8
- b) Explain propagation of electromagnetic wave in dielectric films. 8

OR

- e) Explain plane waves, spherical waves and concept of wave packet with suitable diagram. 8
- f) Obtain expression for reflection and transmitted amplitudes for oblique incidence. 8

2. Either:

- a) Obtain equations of electromagnetic field tensor. 8
- b) Show that Maxwell's electromagnetic wave equation remains invariant under Lorentz transformation. 8

OR

- e) Obtain equation of continuity from Maxwell's electromagnetic field tensor. 8
- f) Discuss covariant form of Lorentz force law in electrodynamics. 8

3. Either:

- a) Explain electric dipole, electric quadrupole. 8
- b) Explain Lienard Wiechert potential. 8

OR

- e) Show that power radiated by point charge is proportional to square of the amplitude (Larmor formula) 8
- f) Explain in detail half wave and full wave antenna. 8

4. Either:

- a) Explain in detail the function of cylindrical waveguide. 8
- b) Obtain an expression for principal mode (TE_{01}) in rectangular wave guide. 8

OR

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| e) | What is Bremsstrahlung radiation? | 8 |
| f) | Explain function and theory of rectangular cavity resonator. | 8 |

5. Attempt all questions.

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| a) | Explain stokes parameter in brief. | 4 |
| b) | Obtain an expression for Lorentz gauge. | 4 |
| c) | Find the magnetic field of a point charge of moving at constant velocity. | 4 |
| d) | A rectangular waveguide has dimensions 2.5cm and 5cm. Determine guide wavelength λ_g , phase velocity and phase constant at a wavelength of 4.5cm for dominant mode. | 4 |
