## PSCPHYT08 - Core Paper-VIII : Electrodynamics-II

P. Pages : 1      ||||||||||||||||||      **GUG/S/23/11223**

Time : Three Hours      \*1401\*      Max. Marks : 80

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**Either:**

**1.** a) Explain stokes parameters in detail. **8**

    b) Explain electromagnetic wave propagation in dielectric films. **8**

**OR**

    e) Explain Fresnel polarization on reflection and refraction. **8**

    f) Obtain expression for reflection and transmitted amplitude for oblique incidence. **8**

**Either:**

**2.** a) Explain electrodynamics field tensor and it's transformation. **8**

    b) Discuss Lorentz gauge condition. **8**

**OR**

    e) Explain covariance of electrodynamics. **8**

    f) Obtain Maxwell's equation using field strength tensor and dual field tensor. **8**

**Either:**

**3.** a) Explain Lienard-Wiechert potential. **8**

    b) Discuss Larmor's formula. **4**

    c) Show that power radiated by point charge is proportional to square of the amplitude. **4**

**OR**

    e) Explain electric dipole, electric quadrapole. **8**

    f) Explain in detail half wave and full wave antenna. **8**

**Either:**

**4.** a) Derive expression for the field in the TE mode in rectangular waveguide. **8**

    b) Explain TE, TM modes in cylindrical waveguide. **8**

**OR**

    e) Explain Bremsstrahlung synchrotron radiation. **8**

    f) Show that $TE_{10}$ mode has lowest cut off frequency among all possible in rectangular waveguide. **8**

**5.** Attempt **all** the followings.

    a) Discuss phase velocity, group velocities and wave packets. **4**

    b) Discuss the Lorentz transformation. **4**

    c) Discuss motion of a charged particle in magnetic fields. **4**

    d) Show that a rectangular waveguide $TE_{00}$ mode doesn't exists. **4**

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