M.Sc. F.Y. (Physics) (CBCS Pattern) Sem-II

PSCPHYT08 - Paper-VIII (Core-VIII) : Electrodynamics-II

P. Pages : 1 **GUG/W/22/11223**

Time : Three Hours * 0 4 8 6 * Max. Marks : 80

Notes : 1. All questions carry equal marks.
2. Assume suitable data wherever necessary.
3. Illustrate your answers wherever necessary with the help of neat sketches.

Either:

1. a) Discuss the phase velocity, group velocity and wave packet in details **6**

b) Express wave equation in complex notation and explain its importance. **2**

c) Explain elliptic, linear & circular polarization in details. **8**

OR

e) Explain Stoke's parameter's in details **8**

f) Discuss polarization in electromagnetic wave also obtain plane wave solation for electromagnetic wave in vacuum. **8**

Either:

2. a) Derive an expression for Lorentz transformation in terms of four vector. **8**

b) Discuss Lorentz gauge condition **8**

OR

e) Evaluate electromagnetic field tensor by using $E = -\nabla\phi - \frac{\partial A}{\partial t}$ and $B = \nabla x A$ **10**

f) Obtain maxwell's equation in terms of field strength tensor and denotes it in tensor notation **6**

Either:

3. a) Explain electric dipole, electric quadrupole radiation. **8**

b) Explain notation of charged particle due to uniform magnetic field. **8**

OR

e) Show that the power radiated by point charge is proportional to square of the amplitude (Larmor formula) **8**

f) Discuss Lieunard-Wiedart potential for a moving point charge. **8**

Either:

4. a) Obtain TE, TM mode in cylindrical waveguide **8**

b) Derive an expression for cut off frequency in TE_{mn} mode in rectangular waveguide **8**

OR

e) Derive an expression for Cherenkov radiation with its applications. **8**

f) Discuss magnetic dipole & electric quadrupole field. **8**

5. Answer all the followings.

a) Derive an expression for propagation in didactic films. **4**

b) Explain equation for continuity form maxwell's equations. **4**

c) Explain in detail half wave antenna **4**

d) Simple tuning is possible for TE_{ll}, mode in cylindrical cavity, Explain. **4**

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