F.Y. M.SC. (Physics) Second Semester Old

0143 - Electrodynamics-II Paper-IV

P. Pages : 2 **GUG/W/18/2241**

Time : Three Hours * 1 7 3 8 * Max. Marks : 80

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1. Either.

a) Explain electromagnetic waves in linear conducting media. **8**

b) State and prove the differential version of Poynting's theorem. **8**

OR

e) Derive four Maxwell's equations. **8**

f) Express wave equation in complex notation and explain its importance. **8**

2. Either.

a) Explain TEM modes in rectangular wave guide. **8**

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

OR

e) Explain metallic boundary conditions. **4**

f) Describe Bessels function. **4**

g) Explain TE and TM modes in cylindrical resonant cavities. **8**

3. Either.

a) Explain Coulomb and Lorentz gauge. **8**

b) Describe Bremsstrahlung Cerenkov radiation and synchrotron radiation. **8**

OR

e) Derive an expression for power radiated by an accelerated charge and angular distribution. **8**

f) Explain scalar and vector potentials. **8**

4. Either.

a) Explain the motion of a charged particle in combined static electric and magnetic field. **8**

b) Explain particle drift in Non-uniform static magnetic field. **8**

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OR

e) Describe in detail adiabatic invariance of flux through orbit of particle. **8**

f) Explain Maxwell's equation in terms of strength tensors. **8**

5. Attempt all the followings.

a) Formulate the boundary condition for reflection and transmission. **4**

b) Show that resonant cavity can be twined but wave guide can not be twined. **4**

c) Explain gauge transformation. **4**

d) Write a note on Dual field strength. **4**

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