M.Sc. (Physics) (NEP Pattern) Semester-I

NEP-234 / 01MSCPH2 - DSC Paper-II - Electrodynamics

P. Pages : 2 **GUG/S/25/15135**

Time : Three Hours * 2 7 7 9 * Max. Marks : 80

Either:

1. a) Derive Poisson and Laplace's equation. **4**

b) Discuss method of separation of variables. **4**

c) State and prove Gree's theorem. **8**

OR

e) State and explain Gayss's Law, derive it's differential form. **8**

f) Explain in details electrostatic energy in dielectric media. **8**

Either:

2. a) What is Ampere's Law? Obtain differential form of Ampere's law. **8**

b) Discuss Biot-Savart law and obtain an expression for magnetic field. **8**

OR

e) Discuss magnetostatic boundary conditions in details. **8**

f) State and prove Poynting's theorem. **8**

Either:

3. a) Define vector potential in magnetostatic. Explain it to solve magnetic problems. **8**

b) Using Maxwell's equation show that e.m. waves penetrate the conducting media to a depth ' δ ' **8**

OR

e) Discuss Gauge transformation. **8**

f) Explain in details properties of electromagnetic fields. **8**

Either:

4. a) Explain propagation of electromagnetic plane wave for conducting medium. **8**

b) Explain interference for electromagnetic wave. **8**

OR

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

f) Explain total internal reflection and critical angle. **8**

5. All questions are compulsory.

a) State and explain Coulomb's law. **4**

b) Discuss Maxwell's displacement current. **4**

c) Explain Gauge invariance. **4**

d) Explain reflection of electromagnetic wave. **4**

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