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PHY-II-001

B.Sc. II Semester (NEP) Degree Examination

PHYSICS

Electricity and Magnetism

Paper : DSC A_2

Time : 2 Hours Maximum Marks : 60

SECTION - A

I. Answer any FIVE of the following questions. (5×2=10)

1. a. What is electric displacement? Write it's S.I. Unit.

b. Write the relationship between electric field and electric potential.

c. What is capacitance of a conductor.

d. State ampere's circuital law.

e. State Faraday's laws of electromagnetic induction.

f. Write maxwell's equations.

g. What is wattless current? Explain.

SECTION - B

II. Answer any FOUR of the following questions. (4×5=20)

2. State and explain coulomb's law.

3. Derive an expression for electric field due to the charged infinite plane.

4. Explain Gauss's law for dielectrics.

5. Derive an expression for magnetic force on a current carrying conductor.

6. Explain B=H curve.

7. Derive an expression for current in an A.C. circuit containing LCR in series combination.

SECTION - C

III. Answer any THREE of the following questions. **(3×10=30)**

8. a. Obtain an expression for potential due to point charge. **(5)**

   b. Define gradient of a scalar function. Explain it's physical significance. **(5)**

9. a. Derive an expression for parallel plate capacitor. **(5)**

   b. State and explain ohm's law mention it's limitations. **(5)**

10. a. State and explain Biot - Savart's law. **(5)**

    b. Calculate current in a circular coil as radius 10 cm and 100 cm turns to produce a magnetic field of 0.1 Tesla at it's center? **(5)**

11. a. Explain the classification of magnetic materials based on their properties. **(5)**

    b. What are electromagnetic waves. Explain properties of electromagnetic waves. **(5)**

12. a. Distinguish between series and parallel resonance circuits. **(5)**

    b. Calculate the resonant frequencies of an LCR parallel resonance circuit with $L = 10$ mH, $C = 1\ \mu$f and $R = 1\ k\Omega$. **(5)**
