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21BSC2C2PHL

B.Sc. II Semester Degree Examination, Sept./Oct. - 2024

PHYSICS

DSC2 : Electricity and Magnetism
(NEP)

Time : 2 Hours Maximum Marks : 60

Note : *(i) Answer **all** the Sections.*

(ii) Non-Programmed Scientific calculators are allowed.

SECTION - A

I. Answer **all** the following questions. **10x1=10**

1. (a) State Gauss Law in electrostatics.

(b) Write the SI unit of Magnetic flux.

(c) State Kirchhoff's Voltage Law.

(d) State Thevenin's Theorem.

(e) State Ampere's Circuit Law.

(f) Mention the SI unit of Self Inductance.

(g) State Gauss Divergence Theorem.

(h) Define Electric Field Intensity.

(i) Mention one example for diamagnetic material.

(j) What is Retentivity ?

SECTION - B

II. Answer **any four** of the following questions. Each question carries **five** marks. **4x5=20**

2. Derive an expression for potential due to an electric dipole.

3. Explain Maximum Power Transfer Theorem with example.

4. Deduce an expression for rms value of alternating current.

5. Deduce an expression for energy stored in a magnetic field.

6. Prove that divcurl $\vec{A} = 0$

7. Mention any five properties of ferromagnetic materials.

P.T.O.

SECTION - C

III. Answer **any three** of the following questions. Each question carries **ten** marks. **3x10=30**

8. (a) Using Gauss Law derive electric field due to uniformly charged sphere. **5+5**

(b) Deduce an expression for Electrostatic Potential energy of a system of charges.

9. (a) Derive an expression for Bandwidth of LCR Series circuit. **7+3**

(b) Write a note on Pointing Vector.

10. (a) Using Biot Savart's Law obtain the expression for magnetic field at a point due to long wire carrying current. **5+5**

(b) Derive expression for magnetic field due to Solenoid.

11. (a) Explain curl of a vector and mention its significances. **5+5**

(b) Deduce the relation between magnetic moment and angular momentum.

12. Explain the Langevin's theory of Paramagnetism. **10**

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