

Roll No.

91528

B. Sc. 2nd Semester Physics (Hons.) (New Scheme)

Examination – May, 2016

MAGNETISM

Paper: Phy-203

Time: Three Hours]

[Maximum Marks: 40

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note: Attempt five questions in all, selecting at least two question from each Unit. All questions carry equal marks.

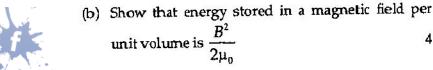
UNIT -I

- 1. (a) Prove that the force acting on a test charge \mathbf{q}_0 moving with a velocity V in a magnetic field of uniform flux density B is $\mathbf{q}_0(\tilde{V}\times \tilde{B})$. How does it lead to the definition of \vec{B} ?
 - (b) State and explain Ampere's circuitallaw.

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2. (a) Explain the term Vector Potential. Using the concept of vector potential deduce Biot-Savart's law.





3. Explain the terms:

Magnetic induction, intensity of Magnetization, magnetic permeability, magnetic intensity and magnetic susceptibility also find relation between them.

4. Discuss domain theory of ferromagnetism. Show that energy lost per unit volume per cycle of magnetization is equal to the area of hysteresis loop. Discuss its application in selecting materials.

UNIT - II

- 5. Explain the properties of magnetic Induction \vec{B} 8
 - (i) $\nabla \times \vec{B} = \mu_0 \vec{J}$

 - (iii) ∇ , $\vec{B}=0$
- 6. (a) Write Faraday's laws of electromagnetic induction.
 - (b) If a conducting loop moves through a Non-Uniform magnetic field then show that e.m.f. included in the loop is equal to negative of the rate of change magnetic flux linked with the loop.

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- 7. (a) What is self induction? Derive an expression for the self inductance of a long solenoid.
 - (b) A coil has inductance of 0.02 Henry calculate the e.m.f. induced when current in the coil changes at the rate of ISO AS-1.
- 8. (a) State and explain Reciprocity theorem of mutual inductance.
 - (b) Prove that curl $E = -\frac{\partial B}{\partial t}$ 2

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