Oct - 2013

Seat No. | | | | | | |

क्रय - 069

PHYSICS PAPER - II (NEW) (11126) PHY - 112
Electricity and Magnetism

P. Pages : 3

Time : Two Hours | Max. Marks : 40

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions are compulsory and carry equal marks.
5. Figures to the right indicate full marks.
6. Draw neat diagram wherever necessary.
7. Use of logarithmic table or standard electronic calculator is allowed.
8. Symbols have their usual meanings.

1. Attempt **any eight** of the following, select the correct option. **8**

i) The unit of inductance is .....
   a) Hertz b) Decibel
   c) Henry d) Volt

ii) Which of the following material is ferromagnetic.
   a) Aluminium b) Sodium
   c) Gold d) Nickel

iii) The transformer whose single winding serves as primary and secondary windings is called as
   a) Autotransformer b) Stepdown transformer
   c) Stepup transformer d) None of these

iv) The magnetic susceptibility of hard magnetic material is
   a) Low b) High
   c) Very high d) None of these

v) The S. I. unit of current density vector is
   a) Webre b) Ampere/m^2
   c) Ampere d) None of these

vi) The property of material due to which the material opposes to complete demagnetization is known as
   a) Resistivity b) Retentivity
   c) Conductivity d) Coercivity

क्रय - 069

vii) Hysteresis loop is a plot of .....

a) $\vec{M}$ vs $\vec{B}$ b) $\vec{M}$ vs $\vec{H}$

c) $\vec{H}$ vs $\vec{M}$ d) None of these

viii) Energy stored in the inductor is in the form of

a) Sound b) Electromagnetic

c) Light d) None of these

ix) The microscopic form of ohms law is

a) $V = IR$ b) $V = I/R$

c) $\vec{J} = \sigma \vec{E}$ d) $\vec{J} = \sigma \rho$

x) The area of hysteresis loop of soft magnetic material is

a) Small b) Large

c) Very large d) None of these

2. Attempt **any four** of the following. 8

a) State Norton's theorem.

b) What are antiferromagnetic materials ? Give example.

c) Draw the curves representing growth and decay of charge in R - C circuit.

d) Give the properties of material to select it as a permanent magnet.

e) Write the equation of continuity.

f) Draw the labeled diagram of transformer with tapped secondary.

3. Attempt **any two** of the following. 8

a) Obtain the expression for growth of charge in R - C circuit.

b) What are magnetic parameters ? Explain magnetization $(\vec{M})$ and magnetic susceptibility $(\overline{X})$.

c) State and prove maximum power transfer theorem.

क्रय - 069

4. a) Attempt **any two** of the following. 6

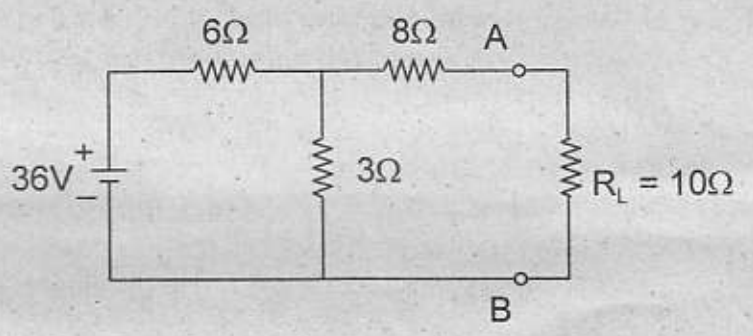
i) Describe mutual induction of coaxial solenoid.

ii) Discuss the decay of charge in L - R circuit.

iii) A potential difference 10V is applied to the coil of 10Ω and at inductance of 1 henry ? What is the current after 1/10 second ?

b) What are hard magnetic materials ? 2

5. State Thevenin's theorem. Give different steps to thevenize the circuit. Thevenize the following circuit hence find the current through load resistance R_L. 8



OR

What is transformer ? Describe closed core transformer and transformer with tapped secondary. Give the different losses in transformer.

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