Seat Number

Nov-2015

कणगा - 030

PHYSICS PAPER - II : PHY - 112
Electricity and Magnetism
(112102)

P. Pages : 4

Time : Two Hours

Max. Marks : 60

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink 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. Figure to the right indicate full marks.
6. Draw a neat labelled diagram wherever necessary.
7. Use of logarithmic table or standard electronic calculator is allowed.
8. Symbols have their usual meanings.

1. a) Attempt **any six** of the following. Select the correct option and rewrite the following. **6**

i) A substance that attracts pieces of iron is .....

a) conductor b) semi conductor
c) magnet d) all of these

ii) The macroscopic form of ohm's law is .....

a) $V = I^2R$ b) $V = IR$
c) $V = IR^2$ d) $V = I/R$

iii) The time constant of R-C circuit is .....

a) T=RC b) $T = R^2C$
c) $T = R/C$ d) $T = C/R$

iv) A group of magnetically aligned atom's is called.....

a) Range b) Lattice
c) Domain d) Crystal

v) Which of the following is a paramagnetic material.....
a) Carbon b) Copper
c) Bismuth d) Oxygen

vi) For step up transformer .....
a) $N_S > N_P$ b) $N_S < N_P$
c) $I_P = I_S$ d) none of these

vii) What is the SI unit of magnetic flux .....
a) Tesla b) Weber
c) Maxwell d) Gauss

viii) The efficiency of D.C. source under maximum power transfer condition is.....
a) 50% b) 45%
c) 75% d) 0%

b) Attempt **any six** of the following. Answer in one sentence. 6

i) Define current and give it's SI unit.

ii) State the principle of transformer.

iii) What is the effect of temperature on resistivity of conductor.

iv) A 200 watt lamp working for 24 hours will consume approximately how many units.

v) State Norton's theorem.

vi) Give any one application of inductive kick.

vii) State Curie – Weiss law.

viii) Define one watt electric power.

2. Attempt **any six** of the following. 12

i) State Millman's theorem.

ii) Define current density.

iii) The current flowing from higher to lower potential is called...current.

iv) One horse power is equal to how many watts.

v) Two inductors L_1 and L_2 sufficiently apart are connected
a) in series b) in parallel.
What is their equivalent inductance ?

vi) What is copper loss in transformer ?

vii) What do you mean by permanent magnet ?

viii) Give two examples of ferromagnetic substances.

ix) Define efficiency of transformer.

3. Attempt **any four** of the following. 12

i) When a coil of resistance 50Ω is connected to d.c. source, the current reaches 0.632 of it's maximum value in 0.01 sec. What is inductance of coil ?

ii) Calculate the number of Joule's in 1kwh.

iii) Draw circuit diagram and sketch well labelled diagram showing the nature of charging of condenser through resistor.

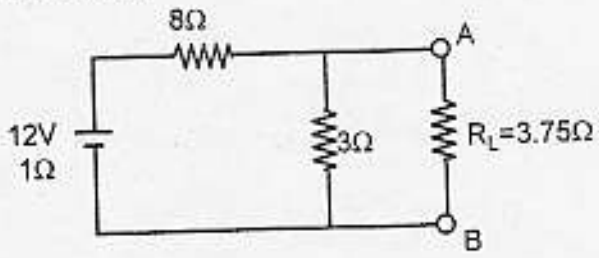
iv) Explain the term magnetic susceptibility (x).

v) Write a note on Isolation transformer.

vi) Discuss the Antiferromagnetic materials.

4. Attempt **any three** of the following. 12

i) Find the current through R_L of the following circuit using Thevenin's theorem.



ii) What is the physical meaning of time constant in an inductive circuit.

iii) Explain the phenomenon of self induction. Define coefficient of self induction.

iv) Distinguish between soft magnetic material and hard magnetic material.

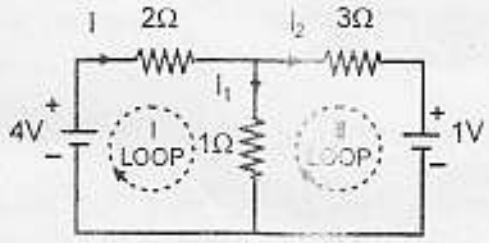
v) Explain spontaneous magnetization and domain.

5. Attempt **any two** of the following. **12**

i) Obtain an expression for growth of current in L-R circuit. Define time constant.

ii) State and prove the maximum power transfer theorem.

iii) State Kirchoff's laws and calculate the values of currents for the following circuit.



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