Model Question Paper

ElectroMagnetic Induction and Alternating Current - Part V

12th Standard

Physics

Reg.No. : | | | | | | |

I.Answer all the Questions.

II.Use blue pen only.

Time : 03:00:00 Hrs

Total Marks : 70

Section-A

5 x 1 = 5

1) The working of the transformer is based on the principle of law of con version of

   (a) Charges (b) Energy (c) Momemtum (d) mass

2) The copper loss in a transformer can be reduced by using

   (a) thin wires having low reistance (b) this wires having high resistance (c) thick wires of considerably low reistance (d) thick wires of high resistance

3) The power loss occurred in the power transmission to longer distance is

   (a) a) $(P/V)^2 R$ (b) b) I^2R (c) Both (a) & (b) are correct (d) (a) is wrong (b) is correct

4) In India, the frequency of electric power used for domestic purpose is

   (a) 100Hz (b) 220Hz (c) 240Hz (d) 50Hz

5) The average of value of a.c current over one complete cycle is

   (a) Zero (b) maximum (c) infinity (d) minimum

Section-B

6 x 3 = 18

6) What are Eddy or Foucault currents?

7) What is called Transformer?

8) Define efficiency of a transformer?

9) Define alternating current and direct current.

10) Can a transformer be used to step up DC. Why?

11) Two rails of a railway track insulated from each other and the ground are connected to a millivoltmeter. The train runs at a speed of 180 Km/hr. Vertical component of earth's magnetic field is $0.2 \times 10^{-4} Wb/m^2$ and the rails are separated by 1m. Find the reading of the voltmeter.

Section-C

5 x 5 = 25

12) Explain how an emf can be induced by changing the area enclosed by the coil in a uniform magnetic field.

13) Obtain an expression for the current flowing in a circuit containing resistance only to which alternating emf is applied. Find the phase relationship between voltage and current.

14) Derive an expression for the average power in an ac circuit.

15) Describe the principle, construction and working of a choke coil.

16) State Lenz's law and illustrate through an experiment. Explain it is in accordance with the law of conservation of energy.

Section-D

2 x 10 = 20

17) Explain long range power transmission.

18) a) Obtain an expression for the current in an ac circuit containing a pure inductance. Find the phase relationship between voltage and current.

(OR)

b) Obtain an expression for the current flowing in the circuit containing capacitance only to which an alternating emf is applied. Find the phase relationship between the current and voltage.

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