Physics

Reg.No. :

I.Answer all the Questions.
II.Use blue pen only.

Time : 01:00:00 Hrs

Total Marks : 75

Section-A

6 x 1 = 6

1) Electromagnetic induction is not used in

   (a) transformer   (b) room heater   (c) AC generator   (d) choke coil

2) Lenz's law is in accordance with the law of

   (a) conservation of charges   (b) conservation of flux   (c) conservation of momentum   (d) conservation of energy

3) The self-inductance of a straight conductor is

   (a) zero   (b) infinity   (c) very large   (d) very small

4) The unit henry can also be written as

   (a) $Vs\,A^{-1}$ (b) $Wb\,A^{-1}$ (c) $\Omega\,s$ (d) all

5) An emf of 12 V is induced when the current in the coil changes at the rate of 40 A S^{-1}. The coefficient of self induction of the coil is

   (a) 0.3 H   (b) 0.003 H   (c) 30 H   (d) 4.8 H

6) A DC of 5A produces the same heating effect as an AC of

   (a) 50 A rms current   (b) 5 A peak current   (c) 5A rms current   (d) none of these

Section-B

5 x 3 = 15

7) What is electromagnetic induction?

8) State Faraday's laws of electromagnetic induction

9) Define coefficient of self-inductance of a coil. Give its unit.

10) Define the unit of self-inductance.

11) Define coefficient of mutual induction.

Section-C

5 x 5 = 25

12) Mention the difference between a step up and step down transformer.

13) Obtain an expression for the self-inductance of a long solenoid.

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

15) 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.

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

Section-D

3 x 10 = 30

17) Explain the mutual induction between two long solenoids. Obtain an expression for the mutual inductance of two long solenoids.

18) Discuss with theory the method of inducing emf in a coil by changing the orientation with respect to the direction of the magnetic field.

19) What are eddy currents? Explain their applications. How they can be minimized.

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