

marks :65

**MOUNT CARMEL MATRIC HR SEC SCHOOL**

subject:physics

**KALLAKURICHI**

**I ANSWER THE FOLLOWING QUESTIONS**

**11X2=22**

1. Mention the ways of producing induced emf.
2. Define average value of an alternating current.
3. State Lenz's law.
4. State Fleming's right hand rule.
5. What is meant by mutual induction?and its unit and give equation
6. How will you define Q-factor?
7. . How will you define RMS value of an alternating current?
8. State Faraday's laws of electromagnetic induction
9. A closed coil of 40 turns and of area 200 cm<sup>2</sup>, is rotated in a magnetic field of flux density 2 Wb m<sup>-2</sup>. It rotates from a position where its plane makes an angle of 30° with the field to a position perpendicular to the field in a time 0.2 sec. Find the magnitude of the emf induced in the coil due to its rotation.
10. The magnetic flux passing through a coil perpendicular to its plane is a function of time and is given by  $\Phi = (2t + 4t^2 + 8t + 8) \text{ Wb}$ . If the resistance of the coil is 5  $\Omega$ , determine the induced current through the coil at a time  $t = 3$  second.
11. what you mean by wattless of current

**II ANSWER THE FOLLOWING QUESTIONS**

**6X3=18**

1. Define inductive and capacitive reactance. Give their units.
2. Mention the various energy losses in a transformer
3. How will you induce an emf by changing the area enclosed by the coil?
- 4 Give the advantage of AC in long distance power transmission with an example.
5. A step-down transformer connected to main supply of 220 V is made to operate 11V,88W lamp. Calculate (i) Transformation ratio and (ii) Current in the primary.

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**6. A 200V/120V step-down transformer of 90% efficiency is connected to an induction stove of resistance  $40 \Omega$ . Find the current drawn by the primary of the transformer**

**III ANSWER THE FOLLOWING QUESTIONS**

**5X5=25**

**1.a) A coil of 200 turns carries a current of 4 A. If the magnetic flux through the coil is  $6 \times 10^{-5}$  Wb, find the magnetic energy stored in the medium surrounding the coil.**

**b) Obtain an expression for average power of AC over a cycle.**

**2. Show that the mutual inductance between a pair of coils is same ( $M_{12} = M_{21}$ ).**

**3. Explain the construction and working of transformer**

**4. Derive an expression for phase angle between the applied voltage and current in a series RLC circuit**

**5. show mathematically that the rotation of a coil in a magnetic field over one rotation induces an alternating emf of one cycle.**

**S. NAGARAJAN ( PHYSICS TEACHER )**

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**KALLAKURICHI-04151220250**