SIR CV RAMAN COACHING CENTRE IDAPPADI,SALEM

XLL PHYSICS –UNIT 4 – MODEL QUESTION PAPER -2024

TOTAL MARK : 35 M

DATE : 02.06.2024

Choose the correct best answer (5 x 1= 5m)

1.The magnification of voltages at series resonance is termed as ……… factor.

a) Q   b) S   c) R   d) P

2. The current in the series RLC circuit becomes …………….. at resonance.

a) maximum   b) minimum   c) zero   d) none of the above

3. Thus we find that for a symmetrical sinusoidal current rms value of current is …………of its peak value

   a) 70.2 %   b) 70.7 %   c) 70 %   d) 70.5 %

4. The average value of AC is ---------- times

    a) 0.627   b) 0.637   c) 0.657   d) 0.698

5. A step-down transformer reduces the supply voltage from 220 V to 11 V and increase the current from 6 A to 100 A. Then its efficiency is

   (a) 1.2   (b) 0.83   (c) 0.12   (d) 0.9

Answer any Three questions (3 x 2 = 6m)

6. State Faraday's laws of electromagnetic induction.

7. State Lenz's law.

8. State Fleming's right hand rule

9. A straight metal wire crosses a magnetic field of flux 4 mWb in a time 0.4 s. Find the magnitude of the emf induced in the wire

10. An induced current of 2.5 mA flows through a single conductor of resistance 100 Ω. Find out

the rate at which the magnetic flux is cut by the conductor

Answer any Three questions (3 x 3 = 9m)

11. How will you define RMS value of an alternating current?

12. How will you define Q-factor?

13. Mention the ways of producing induced emf

14. A square coil of side 30 cm with 500 turns is kept in a uniform magnetic field of 0.4 T. The plane of the coil is inclined at an angle of 30^0 to the field. Calculate the magnetic flux through the coil

15. The equation for an alternating current is given by i = 77 sin 314t. Find the peak current, frequency, time period and instantaneous value of current at t = 2 ms.

Answer any Three questions (3 x 5 = 15m)

16. Prove that the total energy is conserved during LC oscillations.

17. Explain the construction and working of transformer

18. Obtain an expression for average power of AC over a cycle. Discuss its special cases

19. An ideal transformer has 460 and 40,000 turns in the primary and secondary coils respectively. Find the voltage developed per turn of the secondary if the transformer is connected to a 230 V AC mains. The secondary is given to a load of resistance 10^4 Ω. Calculate the power delivered to the load.

20. A rectangular coil of area 70 cm² having 600 turns rotates about an axis perpendicular to a magnetic field of 0.4 Wb m^{-2}. If the coil completes 500 revolutions in a minute, calculate the instantaneous emf when the plane of the coil is (i) perpendicular to the field (ii) parallel to the field and (iii) inclined at 60^0 with the field

Prepared by

Dr.G.THIRUMOORTHI,M.SC,B.ED,PH,D (PHYSICS)

GOVT ARTS COLLEGE SALEM -7

THIRUPHYSICS1994@GMAIL.COM

8610560810.