MODEL QUESTION

(LESSON - 1 TO LESSON - 6)

SUB : PHYSICS   MARKS :70

DATE :   TIME   : 3 .00 HOURS

I   CHOOSE THE BEST ANSWER :   15x 1 = 15

1. Dimension of resistance is
   a) $ML^2T^{-3}A^{-2}$ b) $ML^2T^{-1}A^{-1}$ c) $ML^2T^2A^{-3}$ d) $ML^2T^{-1}A^{-2}$

2. the speed of light in an isotropic medium depends on
   a)the nature of the source b)its wavelength c)its direction of propagation d)its intensity

3. if λ_v , λ_x λ_m and represent the wavelengths of visible light, x-rays and microwaves respectively,
   then   a) $\lambda_m > \lambda_x > \lambda_v$ b) $\lambda_v > \lambda_m > \lambda_x$ c) $\lambda_m > \lambda_v > \lambda_x$ d) $\lambda_v > \lambda_x > \lambda_m$

4. charging current for a capacitor is 0.2 A. Find the displacement current
   a) zero   b) 0.2 A c)0.4 A d)0.1 A

5. For light incident from air on a slab of refractive index 2, the maximum possible angle of
   refraction is   a) 30^0 b) 45^0 c) 60^0 d) 90^0

6. An air bubble in glass slab of   refractive index 1.5 (near normal incidence) s 5 cm deep when
   viewed from one surface and 3 cm deep when viewed from the opposite face. then thickness of
   the slab is a)8cm b)10cm c) 12cm   d) 16cm

7. In a transformer, the number of turns in the primary and the secondary coil are 300 and 1800
   respectively, if the current in primary is 6 A, the that in the secondary coil is
    a)2A b)18A c)12A d)1 A

8. In an ac circuit voltage and current are given by V=50sin50t volt and I =100sin(50t +π/3) mA.
   the power dissipated in the circuit will be
   a) 2.5 KW   b) 1.25 KW   c)5 KW   d) 500 W

9. The flux linked with a coil at any instant t is given by ϕ_B=10t^2-50t +250. the induced emf at t=3s
   is ….
   a) -190 V   b)-10 V   c) 10 V   d0 190 V

10. The horizontal component and vertical components of earth's magnetic field at a place are 0.15 G
    and 0.26 G respectively. The angle of dip is…a)0^0 b) 30^0 c)45^0 d)60^0

11. The magnitude of the magnetic field of a long, straight wire carrying a current of 2A at distance
    of 1 m from it is ….
    a) 1 X 10^{-7} T   b) 2 X 10^{-7} T
    c) 4 X 10^{-7} T   d) 3 X 10^{-7} T

12. The internal resistance of a 2.1 V cell which gives a current of 0.2 A through a resistance of 10
    ohm is a)0.2 ohm   b) 0.5 ohm   c) 0.8 ohm d) 1.0 ohm

13. In India electricity is supplied for domestic use at 220 V. It is supplied at 110 V in USA. If the
    resistance of a 60W bulb for use in India is R, the resistance of a 60W bulb for use in USA will
    be a)R   b)2R   c)R/4 d)4R

14. Electric field unit is
    a)N C^{-1} b) V m^{-1} c)Both a and b   d)None of the above

15. Dimension and unit of electric flux is ..

a) $ML^2T^{-3}A^2$, Nm^2C^{-1} b) $ML^3T^{-3}A^{-1}$, Nm^2C^{-1} c) $ML^2T^{-1}A^{-2}$, Nm^2C^{-1} d) $ML^{-4}T^{-3}A^{-2}$, Nm^2C^{-1}

II ANSWER ANY SIX QUESTIONS .NP.24 IS COMPULSORY :   6x2=12

16. State the applications of seeback effect.
17. What are electromagnetic waves?
18. What is corona discharge? or Define Action of point.
19. State Kirchoff's Voltage rule.
20. Define magnetic dipole moment
21. Difference between coulomb's law and Biot - savart's law
22. A 50cm long solenoid has 400 turns per cm. The diameter of the solenoid is 0.04 m. Find the magnetic flux linked with each turn When it carries a current of 1 A.
23. Give two uses of IR radiation.
24. The relative magnetic permeability of the medium is 2.5 and the relative electrical permittivity of the medium is 2.25 . Compute the refractive index of the medium.

III ANSWER ANY SIX QUESTIONS .NO.33 IS COMPULSORY :   6x3=18

25. A copper wire of cross-sectional area 0.5 mm^2 carries a current of 0.2 A. If the free electron density of copper wire is 8.4 X $10^{28}\,m^{-3}$ then compute the drift velocity of free electron.
26. Derive an expression for the torque experienced by a dipole due to a uniform electric field.
27. Differentiate polar and non-polar molecules.
28. Explain the determination of the internal resistance of a cell using voltmeter.
29. state fleming's left hand rule.
30. Give the three uses of Foucault current or eddy current.
31. Explain briefly about the Ac circuit containing pure resistor and draw the phasor diagram.
32. What is the reason for reddish appearance of sky during sunset and sunrise ?
33. A transmitter consists of LC circuit with an inductance of 1 µH and a Capacitance of 1µF. What is the wavelength of the electromagnetic waves it emits?

IV ANSWER ALL THE QUESTIONS :   5X5=25

34. Derive the expression for resultant capacitance, when capacitors are connected in series and in parallel. (or)
    Explain in detail the construction and working of a vande Graff generator.
35. Describe the microscopic model of current and obtain microscopic form of ohm's law   (or)
    obtain the condition for bridge balance in wheatstones's bridge.
36. Obtain a relation for the magnetic field at a point along the axis of a circular coil carrying current using Biot-Savart law.
    (or) Discuss the working of cyclotron in detail
37. Show mathematically that the rotation of a coil in a magnetic field over one rotation induces an alternating emf of one cycle. (or) Explain the construction and working of transformer
38. Write the properties of electro magnetic waves. (or)
    Describe the Fizeau's method to determine the speed of light.

one mark answer:

1. a) $ML^2T^{-3}A^{-2}$
2. b) its wavelength
3. c) $\lambda_m > \lambda_v > \lambda_x$
4. b) 0.2 A
5. a) 30^0
6. c) 12cm
7. d)1 A
8. b) 1.25 KW
9. b)-10 V
10. d)60^0
11. c) 4×10^{-7} T
12. b) 0.5 ohm
13. c)R/4
14. c)Both a and b
15. b) $ML^3T^{-3}A^{-1}$, Nm^2C^{-1}

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