Padasalai.Net's Quarterly Exam 2022 – Model Question Paper

CLASS : XII   **TIME : 3 Hrs**
SUBJECT : PHYSICS   **MARKS : 70**

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PART – A

CHOOSE THE BEST ANSWER   **15 X 1 = 15**

1. Stars twinkle due to
   - (a) reflection
   - (b) total internal reflection
   - (c) refraction
   - (d) polarization

2. The speed of light in an isotropic medium depends on,
   - (a) its intensity
   - (b) its wavelength
   - (c) the nature of propagation
   - (d) the motion of the source

3. An electric dipole is placed at an alignment angle of 30o with an electric field of 2×10^5 N C–1. It experiences a torque equal to 8 Nm. The charge on the dipole if the dipole length is 1 cm is
   - (a) 4 mC
   - (b) 8 mC
   - (c) 5 mC
   - (d) 7 mC

4. Unit of drift velocity
   - (a) ms^{-1}
   - (b) ms^{1}
   - (c) ms^{-2}
   - (d) 2×10^{-2} C

5. The unit of electric field
   - (a) Ohm
   - (b) Newton/ coulomb
   - (c) Volt
   - (d) Ampere

6. Computer keyboard keys are constructed using ....
   - (a) Resister
   - (b) capacitor
   - (c) transistor
   - (d) All the above

7. 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) R /2

8. Two wires of A and B with circular cross section are made up of the same material with equal lengths. Suppose RA = 3 RB, then what is the ratio of radius of wire A to that of B?
   - (a) 3
   - (b) $\sqrt{3}$
   - (c) $1/ \sqrt{3}$
   - (d) 1 / 3

9. The lower comb of Van de graaff generator is maintained at a positive potential of ____
   - (a) 10 kV
   - (b) 10^7v.
   - (c) 100 v
   - (d) 10^4v

10. Which charge configuration produces a uniform electric field?
    - (a) point charge
    - (b) uniformly charged infinite line
    - (c) uniformly charged infinite plane
    - (d) uniformly charged spherical shell

11. A non-conducting charged ring carrying a charge of q, mass m and radius r is rotated about its axis with constant angular speed ω. Find the ratio of its magnetic moment with angular momentum is ___?
    - (a) q / m
    - (b) 2q /m
    - (c) q / 2m
    - (d) m /2q

12. In a transformer, the number of turns in the primary and the secondary are 410 and 1230 respectively. If the current in primary is 6A, then that in the secondary coil is
    - (a) 2 A
    - (b) 18 A
    - (c) 12 A
    - (d) 1 A

13. 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

14. Which of the following electromagnetic radiations is used for viewing objects ------ ?
    - (a) Microwave
    - (b) gamma rays
    - (b) (c) X- rays
    - (d) infrared

15. Which of the following is false for electromagnetic waves
    - (a) Transverse waves (b)
    - (b) Non-mechanical wave
    - (c) Longitudinal waves
    - (d) Produced by accelerating charges

PART – B

ANSWER ANY SIX QUESTIONS. (Q.NO 24 IS COMPULSORY)   **6 X 2 = 12**

16. Define Q – factor?
17. What is Seebeck effect?
18. Define ampere.
19. Mention the ways of producing induced emf ?
20. State Joule's law of heating?
21. Why are electromagnetic waves non – mechanical waves?
22. State the laws of reflection.
23. Define electric flux? Give its unit.
24. Compute the magnitude of the magnetic field of a long, straight wire carrying a current of 1 A at distance of 1m from it.

PART-C

ANSWER ANY SIX QUESTIONS. (Q.NO 33 IS COMPULSORY)   **6 X 3 = 18**

25. Derive the relation between f and R for a spherical mirror.
26. Discuss the conversion Galvanometer into Ammeter?
27. Difference between Coulomb force and Gravitational force?
28. What is displacement current ?
29. Write two uses microwaves and IR radiation.
30. What are omic and non ohmic divices?
31. List out the advantages of stationary armature-rotating field system of AC generator.
32. Compute the speed of the electromagnetic wave in a medium if the amplitude of electric and magnetic fields are 3×10^4 N C^{-1} and 2×10^{-4} T, respectively.
33. Calculate the equivalent resistance in the following circuit and also find the values of current I, I_1 and I_2 in the given circuit.

PART -D

ANSWER THE ALL QUESTIONS.   **5 X 5 = 25**

34. A) Obtain the expression for electric field due to an infinitely long charged wire

(OR)

   B) Derive the expression for resultant Resistance when resistors connected in series and parallel?
35. A) Derive the expression for the force between two parallel current carrying conductors?

(OR)

   B) Derive an expression for phase angle between the applied Voltage and current in a RLC circuit?
36. A) Explain the various energy losses in a Transformer?

(OR)

   B) Derive the mirror equation and the equation for lateral magnification.
37. A) How the emf of the two coils are compared using potentiometer

(OR)

   B) Explain and write down the Maxwell equation of integral form.
38. A) Write the properties of electromagnetic waves?

(OR)

   B). Obtain the condition for bridge balance in Wheat stone's Bridge?

Prepared by Mr. SAM