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FIRST REVISION TEST - 2024

Standard XII

Reg No [ ][ ][ ][ ][ ][ ]

PHYSICS

Time : 3.00 hrs

Part - I

Marks : 70

I. **Choose the correct answer:**

15 x 1 = 15

1. A carbon resistor of (47 ± 4 7) KΩ to be marked with rings of different colours for its identification. The colour code sequence will be

   a) yellow-green-violet-gold

   b) yellow-violet orange-silver

   c) violet-yellow-orange-silver

   d) green-orange-violet-gold

2. A non-conducting charged ring carrying a charge of q, mass m and radius r is rotated about its axis with constant angular speed w. Find the ratio of its magnetic moment with angular momentum is

   a) q/m

   b) 2q/m

   c) q/2m

   d) q/4m

3. Two metallic sphere of radii 1 cm and 3 cm are given charges of -1×10^{-2} C and 5×10^{-2} C respectively. If these are connected by a conducting wire, the final charge on the bigger sphere is

   a) 3×10^{-2} C

   b) 4×10^{-2} C

   c) 1×10^{-2} C

   d) 2×10^{-2} C

4. The instantaneous values of alternating current and voltage in a circuit are
   $i = \frac{1}{\sqrt{2}} \sin(100 \pi t)$ A and $v = \frac{1}{\sqrt{2}} \sin\left(100 \pi t + \frac{\pi}{3}\right)$ V. The average power in watts consumed in the circuit is

   a) $\frac{1}{4}$

   b) $\frac{\sqrt{3}}{4}$

   c) $\frac{1}{2}$

   d) $\frac{1}{8}$

5. A ray of light travelling in a transparent medium of refractive index n falls, on a surface separating the medium from air at an angle of incidents of 45°. The ray can undergo total internal reflection for the following n

   a) n = 1 25

   b) n = 1.33

   c) n = 1.4

   d) n = 1 5

6. When light is incident on a soap film of thickness 5×10^{-5} cm, the wavelength of light reflected maximum in the visible region is 5320 A°. Refractive index of the film will be

   a) 1.22

   b) 1.33

   c) 1 51

   d) 1 83

7. When a metallic surface is illuminated with radiation of wavelength λ, the stopping potential is V. If the same surface is illuminated with radiation of wavelength 2λ, the stopping potential is V/4. The threshold wavelength for the metallic surface is

   a) 4λ

   b) 5λ

   c) 5/2λ

   d) 3λ

8. The half-life period of a radioactive element A is same as the mean life time of another radio active element B. Initially both have the same number of atoms. Then
   a) A and B have the same decay rate initially
   b) A and B decay at the same rate always
   c) B will decay at faster rate than A   d) A will decay at faster rate than B

9. If a small amount of antimony (Sb) is added to germanium crystal
   a) it becomes a p-type semiconductor   b) the antimony becomes a acceptor atom
   c) there will be more free electrons than hole in the semiconductor
   d) its resistance is increased

10. A concave mirror is held in water, what should be the change in focal length of the mirror?
   a) increases   b) decreases   c) remains the same   d) none of these

11. De-morgans theorem solves
   a) truth table   b) logic gates expression   c) boolean algebra   d) all the above

12. During Einstein's photo electric experiment, what changes are observed when the frequency of the incident radiation is increased?
   a) The value of saturation current increases   b) no effect
   c) the value of stopping potential decreases
   d) the value of stopping potential increases

13. The electron emitted in radiation originates from where?
   a) inner orbits of atoms   b) free electrons existing in nuclei
   c) the decay of a neutron in nuclei   d) proton escaping from the nucleus

14. Which one of the following represents forward bias diode?

   a) 0 V ────▷|──R──�ᴨ──── -2V   b) -4 V ────|◁──R──ᴠᴠᴠ──── -3V

   c) -2 V ────▷|──R──ᴠᴠᴠ──── +2 V   d) -3 V ────|◁──R──ᴠᴠᴠ──── +5 V

15. The method of making nanomaterial by assembling the atoms is called
   a) top down approach   b) bottom up approach
   c) cross down approach   d) diagonal approach

Part - II

II. **Answer any 6 questions. (Q.No.20 is compulsory)**   6 x 2 = 12

16. What is an equipotential surface?

17. State Joules law of heating

18. State Lenz's law.

19. A pulse of light of duration 10^{-6} s is absorbed completely by a small object initially at rest. If the power of the pulse is 60×10^{-3} W, calculate the final momentum of the object.

20. A monochromatic light is incident on an equilateral prism at an angle 30° and is emergent at an angle of 75°. What is the angle of deviation produced by the prism?

21. State Hugens principle.

22. What is photo electric effect?

23. Write down the postulates of Bohr atom model

24. Give the Barkhausen conditions for sustained oscillation

Part - III

III. Answer any 6 questions. (Q.No.27 is compulsory) $6 \times 3 = 18$

25. Derive an expression for the torque experienced by a dipole due to an uniform electric field

26. Discuss the conversion of galvanometer into an ammeter

27. A circular loop of area 5×10^{-2} m² rotates in a uniform magnetic field of 0 2 T. If the loop rotates about its diameter which is perpendicular to the magnetic field as shown in figure. Find the magnetic flux linked with the loop when its plane is (i) normal to the field (ii) inclined 60° to the field and (iii) parallel to the field

28. Write down the properties of electromagnetic waves

29. Differentiate Fresnal and Fraunhefer diffraction

30. List out the characteristics of photons

31. State kirchoff's voltage rule

32. Four silicon diodes and a 10 Ω resistor are connected as shown in figure below. Each diode has a resistance of 1 Ω. Find the current flows through the 10 Ω resistor.
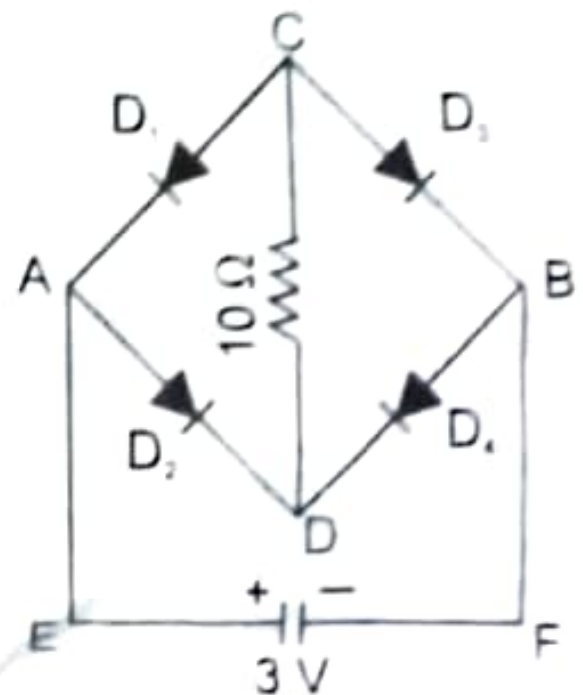
33 What are the possible harmful effects of usage of Nano particles? Why?

Part - IV

IV. Answer all the questions. $5 \times 5 = 25$

34 a)   Obtain the expression for electric field due to an infinity long charged wire

(OR)

   b)   Discuss the working of cyclotron in detail

35 a)   Transistor function as a switch. Explain

(OR)

   b)   Describe the microscopic model of current and obtain general form of Ohm's law.

36 a)   i)   What is dispersion? Obtain the equation for dispersive power of a medium

       ii)   The angle of minimum deviation for equilateral prism is 37°. Find the refractive index of the matrerial of the prism

(OR)

   b)   Obtain the equation for bandwidth in Young's double slit experiment.

37 a)   Discuss the spectral series of hydrogen atom

(OR)

   b)   i)   The self inductance of an air-core solenoid is 4.8 mH. If its core is replaced by iron core, then its self inductance becomes 1.8 H. Find out the relative permeability of iron.

       ii)   How will you induce an emf by charging the area enclosed by the coil?

38 a)   Give the construction and working of photo emissive cell.

(OR)

   b)   Explain the types of absorption spectrum.

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