

FIRST REVISION TEST - 2024

Exam No.

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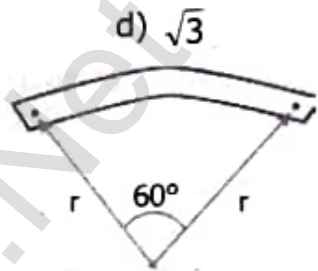
Time : 3-00 Hours

XII - PHYSICS

Marks : 70

PART - I

Note: Choose the correct answer.**(15x1=15)**

- A parallel plate capacitor stores a charge Q at a voltage V . Suppose the area of the parallel plate capacitor and the distance between the plates are each doubled then which is the quantity that will change?
 - Capacitance
 - Charge
 - Voltage
 - Energy density
- Two wires of A and B with circular cross section are made up of the same material with equal lengths. Suppose $R_A = 3 R_B$, then what is the ratio of radius of wire A to that of B?
 - 3
 - $\frac{1}{3}$
 - $\frac{1}{\sqrt{3}}$
 - $\sqrt{3}$
- A bar magnet of length l and magnetic moment p_m is bent in the form of an arc as shown in figure. The new magnetic dipole moment will be
 - $\frac{1}{2} p_m$
 - $\frac{2}{\pi} p_m$
 - $\frac{3}{\pi} p_m$
 - p_m
- In a series RL circuit, the resistance and inductive reactance are the same. Then the phase difference between the voltage and current in the circuit is
 - 30°
 - 45°
 - 60°
 - 90°
- Which of the following is NOT true for electromagnetic waves?
 - It transports energy
 - It transports momentum
 - It transports angular momentum
 - In Vacuum, it travels with different speeds which depend on their frequency
- The ratio between the radius of first three orbits of hydrogen atom is
 - 1:2:3
 - 1:4:9
 - 2:4:6
 - 1:3:5
- The variation of frequency of carrier wave with respect to the amplitude of the modulating signal is called
 - Amplitude modulation
 - Frequency modulation
 - Phase modulation
 - Pulse width modulation
- Emission of electrons by the absorption of heat energy is called _____ emission
 - Thermionic
 - Secondary
 - Photoelectric
 - Field
- Conduction current (i_c), displacement current (i_d) and the total current enclosed by the surface are related by the equation
 - $i = i_c i_d$
 - $i = i_c + i_d$
 - $i = i_c - i_d$
 - $i = i_d - i_c$
- Magnetic field at the centre of the current carrying circular coil is
 - $\frac{\mu_0 NI}{2\pi R} \hat{k}$
 - $\frac{\mu_0 NI}{4\pi R} \hat{k}$
 - $\frac{\mu_0 NI}{2R} \hat{k}$
 - $\frac{\mu_0 NI}{4R} \hat{k}$
- The magnifying power of an astronomical telescope is 8 and the distance between the two lenses is 54cm. The focal lengths of eye lens and objective lens will be respectively
 - 6cm and 48cm
 - 48cm and 6cm
 - 8cm and 64cm
 - 64cm and 8cm
- If the maximum Kinetic Energy of the free electron inside the metal is 0.5eV and the energy needed to overcome the surface barrier of a metal is 3eV then the work function of the metal will be
 - 0.5eV
 - 3eV
 - 3.5eV
 - 2.5eV

13. The refractive index of water with respect to air $4/3$ and the refractive index of glass with respect to air is $3/2$. Then the refractive index of water with respect to glass is
a) $9/8$ b) $8/9$ c) $1/2$ d) 2
14. Two light waves from slit S_1 and S_2 on reaching points P and Q on a screen in Young's double slit experiment have a path difference 0 and $\lambda/4$ respectively. The ratio of light intensities at P and Q will be
a) $4:1$ b) $3:2$ c) $\sqrt{2}:1$ d) $2:1$
15. The particle which gives mass to protons and neutrons are
a) Higgs particle b) Einstein particle
c) Nano particle d) Bulk particle

PART - II

Note: Answer any Six questions. Question No.24 is compulsory.

(6x2=12)

16. Define 'electric flux'.
17. Define temperature coefficient of resistance.
18. State Fleming's left hand rule.
19. What is meant by wattless current?
20. Why are e.m. waves non-mechanical?
21. Why does sky appear blue?
22. Give the definition of intensity of light according to quantum concept and its unit.
23. Define impact parameter.
24. Prove the Boolean expression: $AB + ABC = AB$

PART - III

Note: Answer any Six questions. Question No.33 is compulsory.

(6x3=18)

25. What are the differences between Coulomb force and Gravitational force?
26. State the applications of Seeback effect.
27. Discuss the conversion of Galvanometer into a Voltmeter.
28. How will you induce an emf by changing the area enclosed by the coil?
29. Obtain the equation for radius of illumination (or) Snell's window.
30. Discuss about pile of plates.
31. Explain in detail the nuclear force.
32. Why are NOR and NAND gates called universal gates?
33. A radiation of wavelength 300nm is incident on a silver surface. Will photoelectrons be observed? [work function of silver= 4.7eV]

PART - IV

Note: Answer all the questions.

(5x5=25)

34. a) Calculate the electric field due to a dipole on its axial line.
(OR)
b) Describe the Fizeau's method to determine the speed of light.
35. a) How the emf of two cells are compared using potentiometer?
(OR)
b) Obtain the law of radioactivity.
36. a) Discuss the working of cyclotron in detail.
(OR)
b) Describe briefly Davisson - Germer experiment which demonstrated the wave nature of electrons.
37. a) Explain the construction and working of transformer.
(OR)
b) State and prove De Morgan's first and second theorem.
38. a) Write down Maxwell equations in integral form.
(OR)
b) Explain the Young's double slit experimental setup and obtain the equation for path difference.