

12 P

Register No.

Time : 3.00 Hrs.

Second Revision Examination- 2025

PHYSICS

Marks : 70

PART - I

Note: i) Answer all the questions.

15x1=15

ii) Choose the most appropriate answer from the given four alternatives option code and the corresponding answer.

and write the

1. The vertical component of Earth's magnetic field at a place is equal to the horizontal component. What is the value of angle of dip at this place?
a) 90° b) 60° c) 45° d) 30°
2. The zener diode is primarily used as
a) rectifier b) amplifier c) oscillator d) voltage regulator
3. In a transformer, the number of turns in the primary and the secondary are 30° and 1800 respectively. If the current in the primary is 6A, then that in the secondary coil is
a) 18 A b) 12 A c) 2 A d) 1 A
4. 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?
a) capacitance b) charge c) voltage d) energy density
5. If the input to the NOT gate is A=1011, its output is
a) 0100 b) 1000 c) 1100 d) 0011
6. Which of the following is an electromagnetic wave?
a) α -rays b) β -rays c) γ -rays d) all of the above
7. The particle which gives mass to protons and neutrons are
a) Higgs particle b) Einstein particle c) Nano particle d) Bulk particle
8. A toaster operating at 240V has a resistance of 120Ω . Its power is
a) 400 W b) 2 W c) 480 W d) 240 W
9. 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 w.r.t. medium
10. 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 2λ , the stopping potential is V/4. The threshold wavelength for the metallic surface is
a) 4λ b) 5λ c) $5/2\lambda$ d) 3λ
11. The internal resistance of a 2.1 V cell which gives a current of 0.2 A through a resistance of 10Ω is
a) 0.2Ω b) 0.5Ω c) 0.8Ω d) 1.0Ω
12. The mean life of radioactive element radon is 5.5 days. Its half-life is
a) 8 days b) 2.8 day c) 0.38 days d) 3.8 days
13. Two coherent mono chromatic light beams of intensities I and 4 I are superposed. The maximum and minimum possible intensities in the resulting beam are
a) 5 I and I b) 5 I and 3 I c) 9 I and I d) 9 I and 3 I
14. When the current changes from +2 A to -2 A in 0.05 S, an emf of 8 V is induced in a coil. The co-efficient of self induction of the coil is
a) 0.2 H b) 0.4 H c) 0.8 H d) 0.1 H
15. Light travelling through transparent oil enters into glass of refractive index 1.5. If the refractive index of glass with respect to the oil is 1.25, what is the refractive index of the oil?
a) $n_o = 1.5$ b) $n_o = 1.3$ c) $n_o = 1.2$ d) $n_o = 1.6$

PART - II**Note: i) Answer any 6 of the following questions.****6x2=12****ii) Question number 24 is compulsory.**

16. State Fleming's right hand rule.
17. Mention any two advantages and disadvantages of Robotics.
18. Why are electromagnetic waves non-mechanical?
19. Why does sky appear blue?
20. What do you mean by doping?
21. What are the differences between coulomb force and gravitational force?
22. Define magnetic flux.
23. What is a photo cell? Mention the different types of photo cells.
24. 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 is $8.4 \times 10^{28} \text{ m}^{-3}$, then compute the drift velocity of free electrons.

PART - III**Note: i) Answer any 6 of the following questions.****6x3=18****ii) Question number 33 is compulsory.**

25. List out the advantages and limitations of frequency modulation.
26. Explain the equivalent resistance of a series and parallel resistor network.
27. How do we obtain characteristic x-ray spectra?
28. Give the properties of dia/para/ferro magnetic materials.
29. Derive the relation between f and R for spherical mirror.
30. Obtain the expression for energy stored in the parallel plate capacitor.
31. How will you induce an emf by changing area enclosed by the coil?
32. Write short notes on (i) radio waves (ii) micro waves.
33. Find the (i) angular momentum, (ii) Velocity of the electron revolving in the 5^{th} orbit of hydrogen atom.
($h = 6.6 \times 10^{-34} \text{ Js m}$ $m = 9.1 \times 10^{-31} \text{ kg}$)

PART - IV**Note: Answer all the questions.****5x5=25**

34. a) Discuss the working of cyclotron in detail.
(OR)
b) Derive an expression for electrostatic potential due to an electric dipole.
35. a) Obtain the condition for bridge balance in wheatstone's bridge.
(OR)
b) Explain the construction and working of a full wave rectifier.
36. a) Derive an expression for phase angle between the applied voltage and current in a series RLC Circuit.
(OR)
b) What is spectrum? Explain the types of emission spectrum.
37. a) Describe the Fizeau's method to determine the speed of light.
(OR)
b) Obtain the equation for bandwidth in Young's double slit experiment.
38. a) Describe briefly Davisson – Germer experiment which demonstrated the wave nature of electrons.
(OR)
b) Describe the working of nuclear reactor with a block diagram.