

Third Revision Examination - 2023

Class : 12

PHYSICS

Register Number

Time Allowed : 3.00 Hours]

[Max. Marks : 70

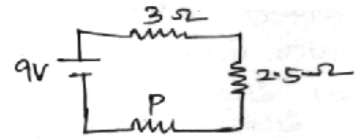
PART-I

Answer all the questions.

15x1=15

Choose the correct answer.

- In Nuclear Reactor the fuel used is uranium. Its natural abundance is
(a) ${}_{92}^{235}\text{U}$ in 99.3% (b) ${}_{92}^{238}\text{U}$ in 99.7% (c) ${}_{92}^{235}\text{U}$ in 0.7% (d) ${}_{92}^{238}\text{U}$ in 0.7%
- Two points A and B are maintained at a potential of 7V and -4V respectively. The workdone in moving 50 electrons from A to B is
(a) 8.80×10^{-17} J (b) -8.80×10^{-17} J (c) 4.40×10^{-17} J (d) 5.80×10^{-17} J
- The technology used for stopping the brain from processing pain is
(a) Precision Medicine (b) Wireless brain sensor
(c) Virtual reality (d) Radiology
- There is a current of 1.0 A in the circuit shown below what is the resistance of P.



- (a) 1.5 Ω (b) 2.5 Ω
(c) 3.5 Ω (d) 4.5 Ω

- The ratio of wavelength of first line of Lyman series to the series limit of Balmer series is
(a) 1:3 (b) 3:1 (c) 1:1 (d) 1:2
- Which of the following is NOT true for electromagnetic wave
(a) it transports energy (b) it transports momentum
(c) it transports angular momentum (d) In vacuum it travels with different speeds which depend on their frequency.
- Select fuse-wires used in the electric circuit for the current less than 15A and more than 15 A are
(a) Copper, lead-tin (b) Copper-tin, lead (c) lead, copper (d) lead-tin, copper
- Three wires of equal lengths are bent in the form of loops. One of the loops in circle, another is semi circle, and third one is square. They are placed in a uniform magnetic field and same electric current is passed through them. Which of the following loop configuration will experience greater torque.
(a) Circle (b) Semi-circle (c) Square (d) All of them
- The speed of extra ordinary ray having refractive index is 1.486 when a monochromatic sodium light passing through a Nicol prism is
(a) 1.5×10^8 m/s (b) 3×10^8 m/s (c) 2.5×10^8 m/s (d) 2×10^8 m/s
- In AC circuits, the projection of phasor gives
(a) the average value of alternating voltage (or) current
(b) the RMS value of alternating voltage (or) current
(c) Instantaneous value of alternating voltage (or) current
(d) algebraic sum of alternating voltage
- A light of wavelength 500 nm is incident on a sensitive metal plate of photo electric work function 1.235eV. The Kinetic energy of the photo electrons emitted is (Take $h=6.6 \times 10^{-34}$ JS)
(a) 0.58 eV (b) 2.48 eV (c) 1.24 eV (d) 1.16 eV
- When a light is incident on a soap film of thickness 5×10^{-2} cm. The wavelength of light reflected maximum in the visible region is 5320 Å. Refractive index of the film will be
(a) 1.22 (b) 1.33 (c) 1.51 (d) 1.83
- Which of the following is true for electromagnetic wave transmitted to reach receiver.
(a) ionospheric propagation 3 MHz to 30 MHz (b) surface wave propagation 2 KHz to 20 MHz
(c) Space wave propagation 3 MHz to 400 MHz (d) Sky wave propagation 20 KHz to 2 MHz.

- When a light of wavelength 500 nm falls on aperture of width 0.5 mm the Fresnel distance will be
(a) 25 mm (b) 25 cm (c) 0.25 cm (d) 25 m
- The ratio of time period of revolution of proton and α - particle in an uniform magnetic field B is
(a) 1:2 (b) 2:1 (c) 1:4 (d) 4:1

PART - II

Answer any six questions. Question Number 24 is Compulsory.

6x2=12

- State Coulomb's law in electrostatics?
- In a transistor connected in the common base configuration. $\alpha = 0.95$, $I_E = 1$ mA. Calculate I_C and I_B .
- Define work function of a metal. Give its unit.
- Distinguish between drift velocity and mobility.
- Define ionisation potential.
- An ideal inductor blocks AC. Why?
- What are Fraunhofer lines.
- Define ampere.
- 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 refractive index of the oil.

PART - III

Answer any six questions. Question Number 33 is Compulsory.

6x3=18

- Mention the properties of equipotential surface.
- Write short note on Thomson effect.
- An electron moving perpendicular to a uniform magnetic field 0.500 T undergoes circular motion of radius 2.50 mm. What is the speed of electron.
- Discuss about Nicol prism.
- List out the advantages and limitations of frequency modulation.
- Give two uses each of i) IR radiation ii) Microwaves iii) UV radiation
- An inductor of inductance L carries an electric current i. How much energy is stored while establishing the current in it?
- UV light of wavelength 1800Å is incident on a lithium surface whose threshold wavelength is 4965Å . Determine the maximum energy of the electron emitted.
- In Nuclear fission reaction what is the total energy released in 100^{th} step in Kwh. Assume number of nuclei undergo present is 2.5×10^{40} .

PART - IV

Note : Answer all the questions.

5x5=25

- (a) Calculate the electric field due to dipole on its axial line.
(OR)
(b) Derive mirror equation.
- (a) Obtain the law of radioactivity. (OR)
(b) Derive an expression for phase angle between the applied voltage and current in a series RLC circuit.
- (a) How the emf of two cells are compared using potentiometer.
(OR)
(b) i) What is rectification?
ii) Draw the circuit diagram of a half wave rectifier and explain its working.
- (a) Explain the effect of potential difference on photoelectric current?
(OR)
(b) Discuss the working of cyclotron in detail.
- (a) Explain the types of absorption spectrum. (OR)
(b) Prove law of refraction using Huygen's principle.