

QUESTIONS FROM CBSE PREVIOUS YEARS BOARD EXAMINATIONS/SAMPLE PAPERS

MULTIPLE CHOICE QUESTIONS (MCQs)

1. The graph shows (Fig. 11.39) the variation of the maximum kinetic energy of the emitted photoelectron with the frequency of the incident radiation for a given metal.

Which of the following gives the work function of the metal?

- (a) x-intercept
- (b) y-intercept
- (c) the slope of the graph
- (d) the area under the graph

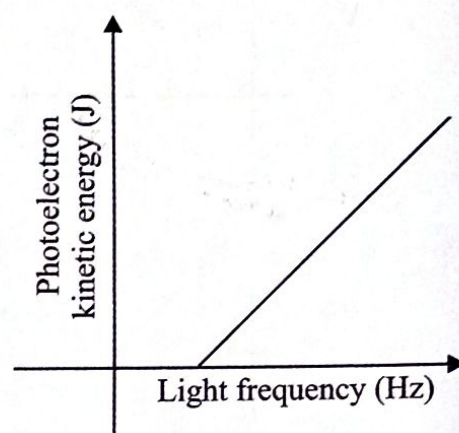


Fig. 11.39

(CBSE Practice Question 2023-24)

2. Given below are two charged subatomic particles P and Q , that are accelerated through same potential difference V . Here, Masses: $m_P = m_Q$; Charges: $\frac{1}{2} q_P = q_Q$.

Which of the two subatomic particles will have longer de Broglie wavelength?

- (a) Particle P , because it has the greater momentum
- (b) Particle Q , because it has the greater momentum
- (c) Particle P , because it has the smaller momentum
- (d) Particle Q , because it has the smaller momentum

(CBSE Practice Question 2022-23)

3. A metallic plate exposed to white light emits electrons. For which of the following colours of light, the stopping potential will be maximum?

- (a) Blue
- (b) Yellow
- (c) Red
- (d) Violet

(CBSE Sample Question Paper 2022-23)

4. The work function for a metal surface is 4.14 eV. The threshold wavelength for this metal surface is:

- (a) 4125 Å
- (b) 2062.5 Å
- (c) 3000 Å
- (d) 6000 Å

(CBSE Sample Question Paper 2022-23)

5. A graph is plotted between the stopping potential (on y-axis) and the frequency of incident radiation (on x-axis) for a metal. The product of the slope of the straight line obtained and the magnitude of charge on an electron is equal to :

- (a) h
- (b) $\frac{h}{c}$
- (c) $\frac{2h}{c}$
- (d) $\frac{h}{2c}$ (CBSE 2023)

6. Light of frequency 6.4×10^{14} Hz is incident on a metal of work function 2.14 eV. The maximum kinetic energy of the emitted electrons is about :

- (a) 0.25 eV
- (b) 0.51 eV
- (c) 1.02 eV
- (d) 0.10 eV

(CBSE 2023)

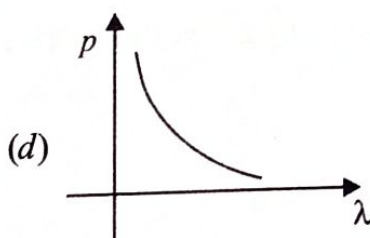
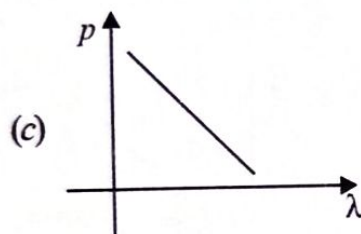
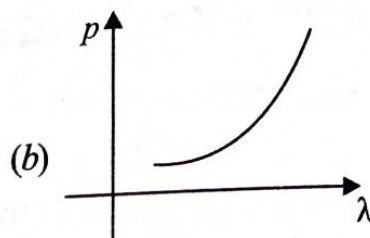
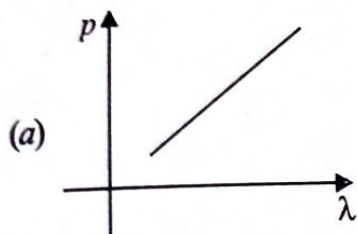
7. A proton and an alpha particle have the same kinetic energy. The ratio of de Broglie wavelengths associated with the proton to that with the alpha particle is :

- (a) 1 (b) 2 (c) $2\sqrt{2}$ (d) $\frac{1}{2}$ (CBSE 2023)

8. The energy of a photon of wavelength λ is

- (a) $hc\lambda$ (b) hc/λ (c) λ/hc (d) $\lambda h/c$ (CBSE 2023)

9. Which of the following graphs correctly represents the variation of a particle momentum with its associated de-Broglie wavelength?



(CBSE 2023)

10. Light of frequency $1.5 \nu_0$ is incident on a photosensitive material of threshold frequency ν_0 . If the frequency of the incident radiation is kept constant and intensity is increased, the photo current will :

- (a) increase (b) decrease
(c) not change (d) first decrease and then become zero (CBSE 2023)

11. Photons of energies 1 eV and 2 eV are successively incident on a metallic surface of work function 0.5 eV. The ratio of kinetic energy of most energetic photoelectrons in the two cases will be

- (a) 1 : 2 (b) 1 : 1 (c) 1 : 3 (d) 1 : 4 (CBSE 2020)

12. The kinetic energy of a proton and that of an α -particle are 4 eV and 1 eV, respectively. The ratio of the de-Broglie wavelengths associated with them, will be

- (a) 2 : 1 (b) 1 : 1 (c) 1 : 2 (d) 4 : 1 (CBSE 2020)

13. A photocell connected in an electrical circuit is placed at a distance 'd' from a source of light. As a result, current I flows in the circuit. What will be the current in the circuit when the distance is reduced to 'd/2'?

- (a) I (b) $2I$ (c) $4I$ (d) $I/2$ (CBSE 2020)

14. If photons of frequency ν are incident on the surfaces of metals. A and B of threshold frequencies $\nu/2$ and $\nu/3$ respectively, the ratio of the maximum kinetic energy of electrons emitted from A to that from B is

- (a) 2 : 3 (b) 3 : 4 (c) 1 : 3 (d) $\sqrt{3} : \sqrt{2}$ (CBSE 2020)