



Class 12 Physics | Dual Nature Of Radiation And Matter

MCQ WORKSHEET • 15 questions • Choose one correct option • Suggested time: 25 minutes

1. Energy of a photon of frequency ν is:

- A. ν/h B. $h\nu^2$ C. h/ν D. $h\nu$

2. Photoelectric emission occurs only if light frequency is:

- A. Below threshold always
B. At least the threshold frequency
C. Independent of the metal
D. Zero

3. Work function equals:

- A. $h\nu_0$ B. $e\nu_0$ C. h/ν_0 D. ν_0/h

4. Einstein's photoelectric equation is:

- A. $K_{\max} = h\nu - \phi$ B. $K_{\max} = h\nu + \phi$
C. $K_{\max} = h\nu\phi$ D. $K_{\max} = \phi - h\nu$

5. Light of photon energy 5 eV falls on a metal of work function 2 eV. $K_{\max}$ is:

- A. 3 eV B. 2.5 eV C. 7 eV D. 10 eV

6. For $K_{\max} = 3$ eV, stopping potential magnitude is:

- A. 3 V B. 1.5 V C. 9 V D. 6 V

7. At fixed frequency above threshold, increasing intensity increases primarily:

- A. Saturation photocurrent
B. Work function
C. Maximum kinetic energy
D. Stopping potential

8. At fixed intensity, increasing frequency above threshold increases:

- A. Planck's constant
B. Maximum electron kinetic energy
C. Electron charge
D. Work function

9. Slope of stopping potential versus frequency is:

- A. e/h B. e C. h D. h/e

10. Increasing intensity below threshold frequency produces:

- A. No photoemission in the usual single-photon regime
B. A lower work function
C. Immediate emission regardless of frequency
D. Increased stopping potential

11. A photon has momentum magnitude:

- A. h/λ B. 0 C. $h\lambda$ D. λ/h

12. De Broglie wavelength of a particle is:

- A. h/p^2 B. h/p C. p/h D. hp

13. If a nonrelativistic particle's momentum doubles, its wavelength becomes:

- A. Twice B. Unchanged C. Four times D. Half

14. An electron accelerated from rest through V has wavelength proportional to:

- A. V B. $\sqrt{V}$ C. $1/V$ D. $1/\sqrt{V}$

15. An electron and proton have equal momenta. Their de Broglie wavelengths are:

- A. Larger for proton B. Larger for electron
C. Equal D. Both zero

ANSWER KEY — check after completing all 15 questions

1.D 2.B 3.A 4.A 5.A 6.A 7.A 8.B 9.D 10.A 11.A 12.B 13.D 14.D 15.C

Original exam-style practice • Reference notes: www.physics.guru/cbse-practice-papers/ • Not an official paper