

JEE MAIN DUAL NATURE OF RADIATION AND MATTER — EINSTEIN'S PHOTOELECTRIC EQUATION, PARTICLE NATURE OF LIGHT — PYQS

Max. Marks: 32

Questions: 8

Section A (MCQ) — 8 questions

- Q.1** K_1 and K_2 be the maximum kinetic energies of photoelectrons emitted from a surface of a given material for the light of wavelength λ_1 and λ_2 , respectively. If $\lambda_1 = 2\lambda_2$ then the work function of material is given by :

[JEE Main 2026 (Online) 8th April Evening Shift]

- (1) $K_2 + 2K_1$ (2) $2K_2 - K_1$
 (3) $K_1 - 2K_2$ (4) $K_2 - 2K_1$

Scan or tap for the full solution 

- Q.2** Light source having wavelength 331 nm is used to generate photo-electrons whose stopping potential is 0.2 V. The work function of the used metal in the experiment is $\alpha \times 10^{-19}$ J. The value of α is _____.
 ($h = 6.62 \times 10^{-34}$ J s, $e = 1.6 \times 10^{-19}$ C and $c = 3 \times 10^8$ m/s)

[JEE Main 2026 (Online) 5th April Morning Shift]

- (1) 3.68 (2) 4.68 (3) 5.68 (4) 2.68

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- Q.3** For a certain metal, when monochromatic light of wavelength λ is incident, the stopping potential for photoelectrons is $3V_0$. When the same metal is illuminated by light of wavelength 2λ , then the stopping potential becomes V_0 . The threshold wavelength for photoelectric emission for the given metal is $\alpha\lambda$. The value of α is _____.
 [JEE Main 2026 (Online) 2nd April Morning Shift]

- (1) 1 (2) 4 (3) 2 (4) 3

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- Q.4** When a light of a given wavelength falls on a metallic surface the stopping potential for photoelectrons is 3.2 V. If a second light having wavelength twice of first light is used, the stopping potential drops to 0.7 V. The wavelength of first light is _____ m.
 ($h = 6.63 \times 10^{-34}$ J s, $e = 1.6 \times 10^{-19}$ C, $c = 3 \times 10^8$ m/s)

[JEE Main 2026 (Online) 24th January Evening Shift]

- (1) 2.9×10^{-8} (2) 2.5×10^{-7}
 (3) 3.1×10^{-7} (4) 2.2×10^{-8}

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- Q.5** Light is incident on a metallic plate having work function 110×10^{-20} J. If the produced photoelectrons have zero kinetic energy then the angular frequency of the incident light is _____ rad/s. ($h = 6.63 \times 10^{-34}$ J s)

[JEE Main 2026 (Online) 22nd January Evening Shift]

- (1) 1.04×10^{13} (2) 1.66×10^{16}
 (3) 1.66×10^{15} (4) 1.04×10^{16}

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- Q.6** A light wave described by $E = 60[\sin(3 \times 10^{15}t) + \sin(12 \times 10^{15}t)]$ (in SI units) falls on a metal surface of work function 2.8 eV. The maximum kinetic energy of ejected photoelectron is (approximately) _____ eV.
 ($h = 6.6 \times 10^{-34}$ J s and $e = 1.6 \times 10^{-19}$ C)

[JEE Main 2026 (Online) 21st January Morning Shift]

- (1) 3.8 (2) 7.8 (3) 6.0 (4) 5.1

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- Q.7** The work function of a metal is 3 eV. The color of the visible light that is required to cause emission of photoelectrons is

[JEE Main 2025 (Online) 3rd April Morning Shift]

- (1) Red (2) Green (3) Blue (4) Yellow

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- Q.8** Which of the following phenomena cannot be explained by wave theory of light?

[JEE Main 2025 (Online) 28th January Evening Shift]

- (1) Refraction of light (2) Reflection of light
 (3) Diffraction of light (4) Compton effect

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ANSWER KEY

Ques.	1	2	3	4	5	6	7	8			
Ans.	4	3	2	2	4	4	3	4			