

Most Repeated Questions in JEE Main Physics from Photoelectric Effect

Q: In an experiment with photoelectric effect, the stopping potential,

- (a) is $(1/e)$ times the maximum kinetic energy of the emitted photoelectrons
- (b) increases with increase in the intensity of the incident light
- (c) decreases with increase in the intensity of the incident light
- (d) increases with increase in the wavelength of the incident light

Q: Assertion (A) : Emission of electrons in photoelectric effect can be suppressed by applying a sufficiently negative electron potential to the photoemissive substance.

Reason (R) : A negative electric potential, which stops the emission of electrons from the surface of a photoemissive substance, varies linearly with frequency of incident radiation.

- (a) Both (A) and (R) are true and (R) is the correct explanation of (A)
- (b) Both (A) and (R) are true but (R) is not the correct explanation of (A)
- (c) (A) is false but (R) is true
- (d) (A) is true but (R) is false

Q: In photoelectric effect an em-wave is incident on a metal surface and electrons are ejected from the surface. If the work function of the metal is 2.14 eV and stopping potential is 2 V , what is the wavelength of the emwave? (Given $hc = 1242\text{eVnm}$ where h is the Planck's constant and c is the speed of light in vacuum.)

Q: A light source of wavelength λ illuminates a metal surface and electrons are ejected with maximum kinetic energy of 2 eV . If the same surface is illuminated by a light source of wavelength $\lambda/2$, then the maximum kinetic energy of ejected electrons will be (The work function of metal is 1 eV)

Q: The work functions of cesium (Cs) and lithium (Li) metals are 1.9 eV and 2.5 eV , respectively. If we incident a light of wavelength 550 nm on these two metal surfaces, the photo-electric effect is possible for the case of

Q: UV light of 4.13 eV is incident on a photosensitive metal surface having work function 3.13 eV. The maximum kinetic energy of ejected photoelectrons will be:

Q: Which of the following phenomena does not explain by wave nature of light. A. reflection B. diffraction C. photoelectric effect D. interference E. polarization

Q: In photoelectric experiment energy of 2.48 eV irradiates a photosensitive material. The stopping potential was measured to be 0.5 V. Work function of the photosensitive material is :

Q: In a photoelectric effect experiment a light of frequency 1.5 times the threshold frequency is made to fall on the surface of photosensitive material. Now if the frequency is halved and intensity is doubled, the number of photoelectrons emitted will be:

Q: For the photoelectric effect, the maximum kinetic energy (E_k) of the photoelectrons is plotted against the frequency (ν) of the incident photons as shown in figure. The slope of the graph gives

Q: Statement I : Stopping potential in photoelectric effect does not depend on the power of the light source.

Statement II : For a given metal, the maximum kinetic energy of the photoelectron depends on the wavelength of the incident light.

- (A) I is incorrect but II is correct
- (B) Both I & II are incorrect
- (C) I Correct but II Incorrect
- (D) Both I & II are correct

Q: From the photoelectric effect experiment, following observations are made. Identify which of these are correct

- A. The stopping potential depends only on the work function of the metal.
- B. The saturation current increases as the intensity of incident light increases.
- C. The maximum kinetic energy of a photo electron depends on the intensity of the incident light.
- D. Photoelectric effect can be explained using wave theory of light.

Choose the correct answer from the options given below:

- (A) B, C Only
- (B) A, C, D
- (C) B Only
- (D) A, B, D