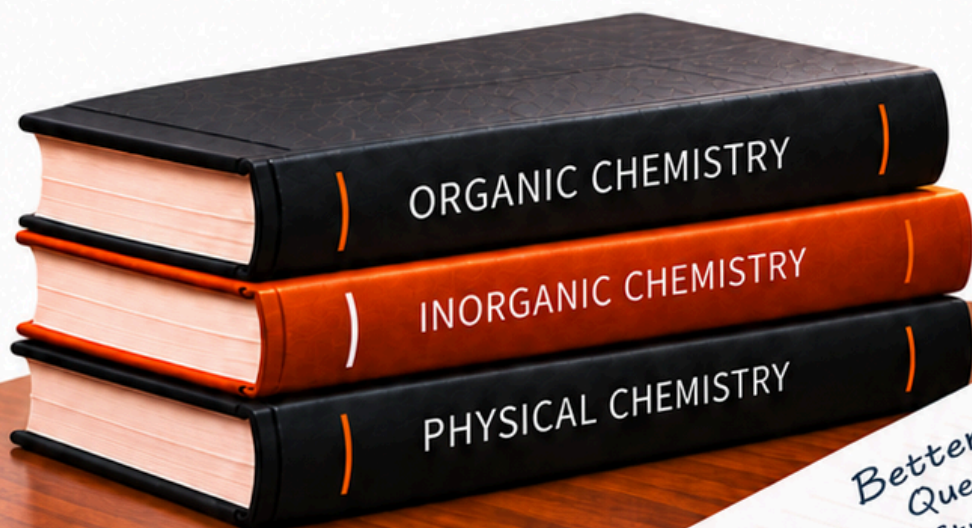
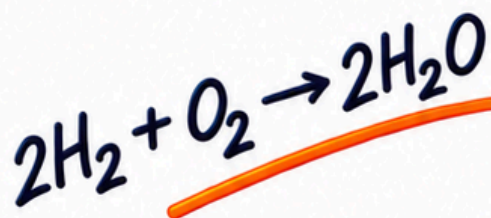
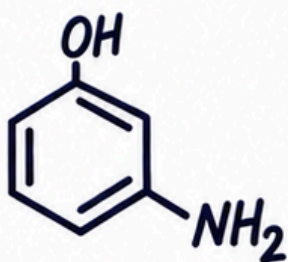


JEE Main Chemistry

Photoelectric effect PYQ

PRACTICE
TODAY
A BRIGHTER
TOMORROWBetter
Questions
Stronger
Concepts
Brighter Future

Subject: Chemistry

Years: 2026-2014

Total Questions: 21

About this PYQ collection

What is inside

A complete topic-wise set of **21 previous year questions** on **Photoelectric effect** from **JEE Main (2026-2014)**, across **10 exam years**. **19 questions** are from 2019 onwards, so most of the set reflects the recent NTA pattern.

Questions are arranged to reduce unused page space, with newest-first priority and continuous numbering from 1. Each carries an exam date and shift tag to trace the original paper.

Topic-wise questions

TOPIC	QS	%
Photoelectric effect	21	100%

Question types

TYPE	QS	%
Single-correct MCQ	11	52%
Numerical value	10	48%

Numerical-value questions have no options; all 10 are from 2020 onwards.

How these questions help you

- **Know where the marks are:** photoelectric effect make up **21 of 21 questions (about 100%)**.
- **Build speed and accuracy:** practice the concepts and question styles used in previous papers.
- **Learn the patterns:** the same question styles return year after year.
- **Strengthen other chapters:** these concepts support further study in Chemistry.

Questions – Photoelectric effect

1. The surface of sodium metal is irradiated with radiation of wavelength x nm. The kinetic energy of ejected electrons is 2.8×10^{-20} J. The work function of sodium is 2.3 eV. The value of x is _____ $\times 10^2$ nm. (Nearest integer)

(Given: $h = 6.6 \times 10^{-34}$ J s ; $1 \text{ eV} = 1.6 \times 10^{-19}$ J ; $c = 3.0 \times 10^8 \text{ m s}^{-1}$)

(2 Apr 2026 | Shift 2)

2. The work functions of two metals (M_A and M_B) are in the 1 : 2 ratio. When these metals are exposed to photons of energy 6 eV, the kinetic energy of liberated electrons of $M_A : M_B$ is in the ratio of 2.642 : 1. The work functions (in eV) of M_A and M_B are respectively.

(23 Jan 2026 | Shift 2)

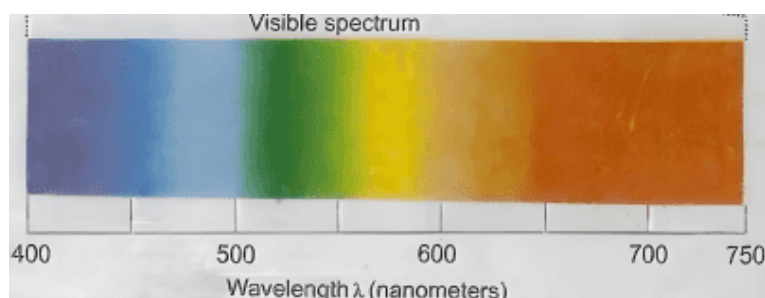
(A) 3.1, 6.2

(B) 1.5, 3.0

(C) 2.3, 4.6

(D) 1.4, 2.8

3.



Which of the following statements are correct, if the threshold frequency of caesium is 5.16×10^{14} Hz ?

- A. When Cs is placed inside a vacuum chamber with an ammeter connected to it and yellow light is focused on Cs, the ammeter shows the presence of current.
- B. When the brightness of the yellow light is dimmed, the value of the current in the ammeter is reduced.
- C. When a red light is used instead of the yellow light, the current produced is higher with respect to the yellow light.
- D. When a blue light is used, the ammeter shows the formation of current.
- E. When a white light is used, the ammeter shows formation of current.

Choose the correct answer from the options given below:

(7 Apr 2025 | Shift 1)

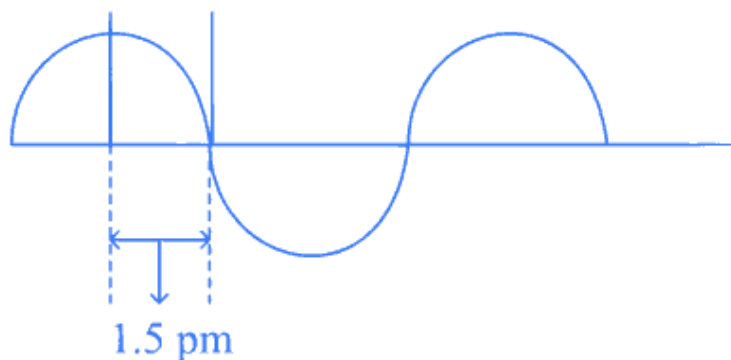
(A) B, C and D Only

(B) A, C, D and E Only

(C) A, B, D and E Only

(D) A, D and E Only

4. A hypothetical electromagnetic wave is shown below.



The frequency of the wave is $x \times 10^{19}$ Hz.

$x =$ _____ (nearest integer)

(8 Apr 2024 | Shift 1)

5. Values of work function (W_0) for a few metals are given below

Metal	Li	Na	K	Mg	Cu	Ag
W_0/eV	2.42	2.3	2.25	3.7	4.8	4.3

The number of metals which will show photoelectric effect when light of wavelength 400 nm falls on it is _____

Given: $h = 6.6 \times 10^{-34}$ J s

$c = 3 \times 10^8$ ms $^{-1}$

$e = 1.6 \times 10^{-19}$ C

(12 Apr 2023 | Shift 1)

6. Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R :

Assertion A : In the photoelectric effect, the electrons are ejected from the metal surface as soon as the beam of light of frequency greater than threshold frequency strikes the surface.

Reason R : When the photon of any energy strikes an electron in the atom, transfer of energy from the photon to the electron takes place.

In the light of the above statements, choose the most appropriate answer from the options given below :

(11 Apr 2023 | Shift 1)

- (A) Both A and R are correct and R is the correct explanation of A
- (B) A is not correct but R is correct
- (C) A is correct but R is not correct
- (D) Both A and R are correct but R is NOT the correct explanation of A

7. If the wavelength for an electron emitted from H-atom is 3.3×10^{-10} m, then energy absorbed by the electron in its ground state compared to minimum energy required for its escape from the atom, is _____ times. (Nearest integer)
[Given : $h = 6.626 \times 10^{-34}$ J s]
Mass of electron = 9.1×10^{-31} kg (28 Jul 2022 | Shift 2)
-
8. If the work function of a metal is 6.63×10^{-19} J, the maximum wavelength of the photon required to remove a photoelectron from the metal is _____ nm. (Nearest integer)
[Given : $h = 6.63 \times 10^{-34}$ J s, and $c = 3 \times 10^8$ m s $^{-1}$] (28 Jun 2022 | Shift 1)
-
9. The minimum energy that must be possessed by photons in order to produce the photoelectric effect with platinum metal is :
[Given : The threshold frequency of platinum is 1.3×10^{15} s $^{-1}$ and $h = 6.6 \times 10^{-34}$ J s.] (25 Jun 2022 | Shift 2)
- (A) 3.21×10^{-14} J (B) 6.24×10^{-16} J
(C) 8.58×10^{-19} J (D) 9.76×10^{-20} J
-
10. A metal surface is exposed to 500 nm radiation. The threshold frequency of the metal for photoelectric current is 4.3×10^{14} Hz. The velocity of ejected electron is _____ $\times 10^5$ ms $^{-1}$ (Nearest integer)
[Use : $h = 6.63 \times 10^{-34}$ Js, $m_e = 9.0 \times 10^{-31}$ kg] (26 Aug 2021 | Shift 2)
-
11. A source of monochromatic radiation of wavelength 400 nm provides 1000 J of energy in 10 seconds. When this radiation falls on the surface of sodium, $x \times 10^{20}$ electrons are ejected per second. Assume that wavelength 400 nm is sufficient for ejection of electron from the surface of sodium metal. The value of x is _____. (Nearest integer)
($h = 6.626 \times 10^{-34}$ Js) (25 Jul 2021 | Shift 1)
-
12. When light of wavelength 248 nm falls on a metal of threshold energy 3.0 eV, the de-Broglie wavelength of emitted electrons is _____ Å. (Round off to the Nearest Integer).
[Use : $\sqrt{3} = 1.73$, $h = 6.63 \times 10^{-34}$ Js
 $m_e = 9.1 \times 10^{-31}$ kg; $c = 3.0 \times 10^8$ ms $^{-1}$; $1\text{eV} = 1.6 \times 10^{-19}$ J] (16 Mar 2021 | Shift 1)

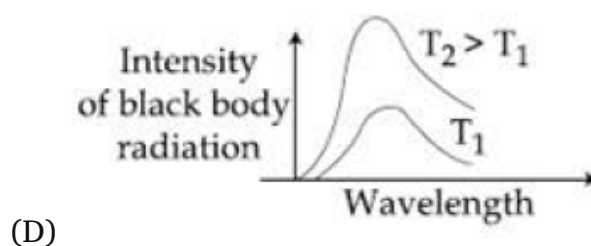
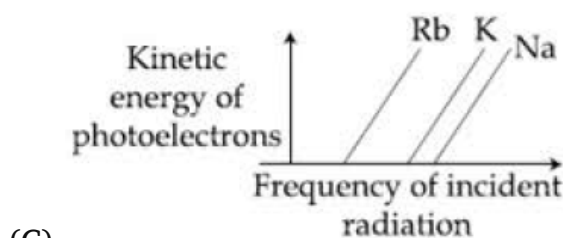
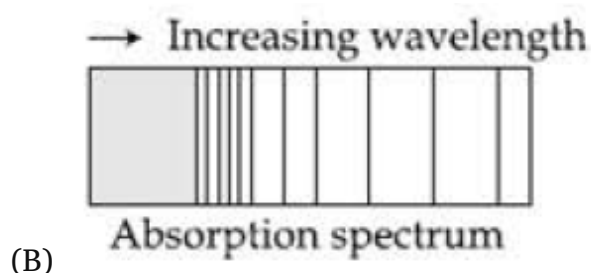
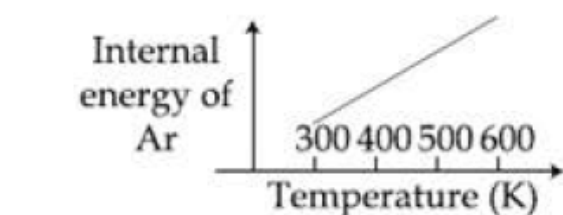
13. Among the following, number of metal/s which can be used as electrodes in the photoelectric cell is _____. (Integer answer)

(A) Li
(B) Na
(C) Rb
(D) Cs

(25 Feb 2021 | Shift 2)

14. The figure that is not a direct manifestation of the quantum nature of atoms is :

(2 Sept 2020 | Shift 1)



15. The work function of sodium metal is 4.41×10^{-19} J. If photons of wavelength 300 nm are incident on the metal, the kinetic energy of the ejected electrons will be ($h = 6.63 \times 10^{-34}$ J s; $c = 3 \times 10^8$ m/s) _____ $\times 10^{-21}$ J.

(2 Sept 2020 | Shift 2)

16. If p is the momentum of the fastest electron ejected from a metal surface after the irradiation of light having wavelength λ , then for $1.5 p$ momentum of the photoelectron, the wavelength of the light should be: (Assume kinetic energy of ejected photoelectron to be very high in comparison to work function)

(8 Apr 2019 | Shift 2)

(A) $1/2 \lambda$ (B) $3/4 \lambda$
(C) $4/9 \lambda$ (D) $2/3 \lambda$

17. What is the work function of the metal if the light of wavelength $4000\text{ \AA}$ generates photoelectrons of velocity $6 \times 10^5 \text{ ms}^{-1}$ from it ?

(Mass of electron = $9 \times 10^{-31} \text{ kg}$;

Velocity of light = $3 \times 10^8 \text{ ms}^{-1}$

Plank's constant = $6.626 \times 10^{-34} \text{ Js}$;

Charge of electron = $1.6 \times 10^{-19} \text{ JeV}^{-1}$)

(12 Jan 2019 | Shift 1)

- (A) 4.0 eV (B) 0.9 eV
(C) 2.1 eV (D) 3.1 eV

18. The de Broglie wavelength (λ) associated with a photoelectron varies with the frequency (ν) of the incident radiation as, [ν_0 is threshold frequency] :

(11 Jan 2019 | Shift 2)

- (A) $\lambda \propto \frac{1}{(\nu - \nu_0)^{\frac{3}{2}}}$ (B) $\lambda \propto \frac{1}{(\nu - \nu_0)^{\frac{1}{4}}}$
(C) $\lambda \propto \frac{1}{(\nu - \nu_0)}$ (D) $\lambda \propto \frac{1}{(\nu - \nu_0)^{\frac{1}{2}}}$

19. Ejection of the photoelectron from metal in the photoelectric experiment can be stopped by applying 0.5 V when the radiation of 250 nm is used. The work function of the metal is :

(15 Apr 2018 | Shift 1)

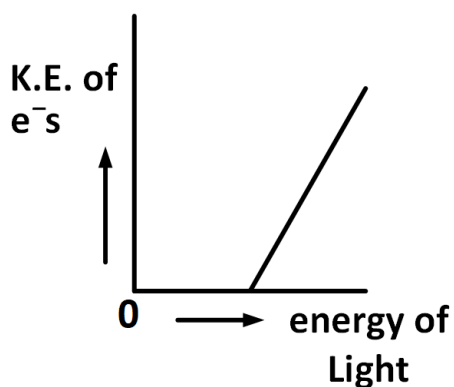
- (A) 4 eV (B) 4.5 eV
(C) 5 eV (D) 5.5 eV

20. If λ_0 and λ be threshold wavelength and wavelength of incident light, the velocity of photoelectron ejected from the metal surface is

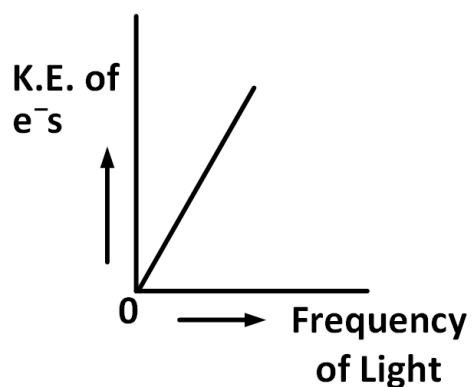
(11 Apr 2014 | Single slot)

- (A) $\sqrt{(2h)/m}$ (B) $\sqrt{(2hc)/m} (\lambda_0 - \lambda)$
(C) $\sqrt{(2hc)/m} ((\lambda_0 - \lambda)/(\lambda\lambda_0))$ (D) $\sqrt{(2h)/m} ((1/\lambda_0) - (1/\lambda))$

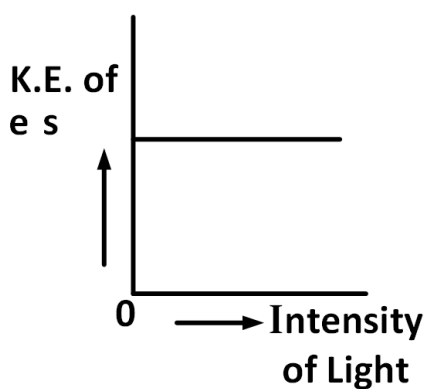
21. Which of the graphs shown below does not represent the relationship between incident light and the electron ejected from metal surface ? (10 Jan 2019 | Shift 1)



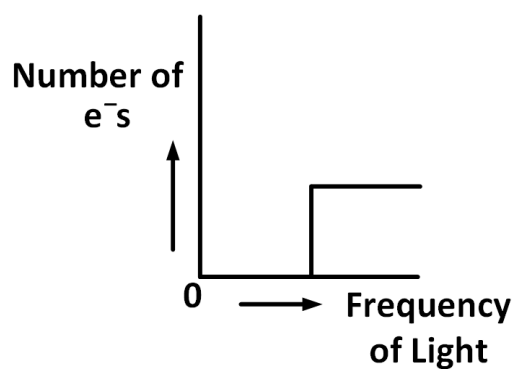
(A)



(B)



(C)



(D)