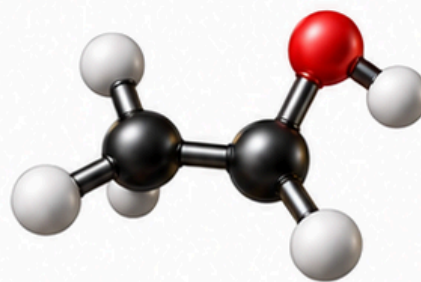


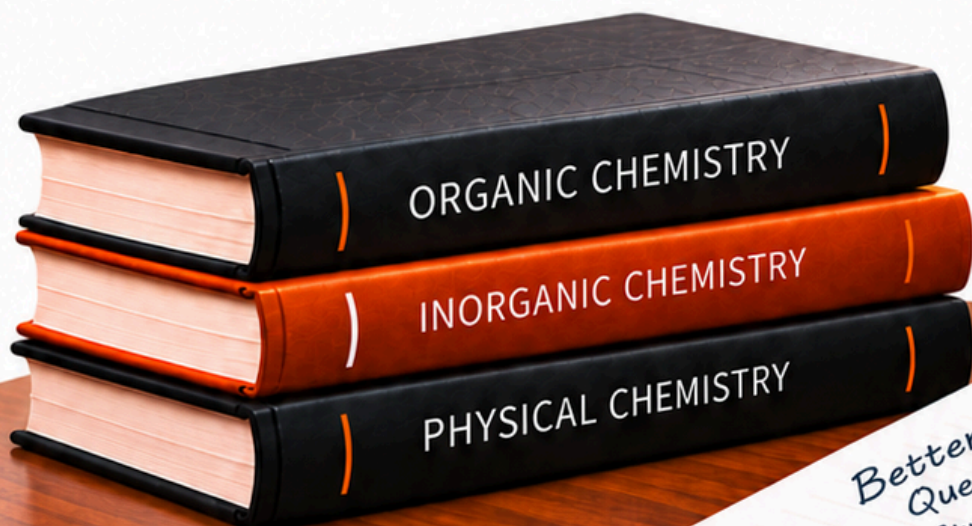
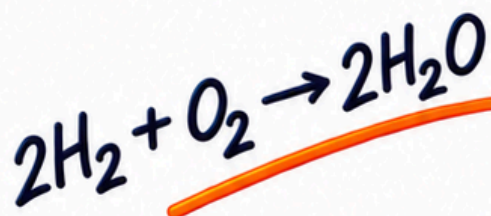
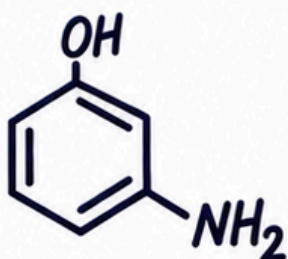


REACTIONS
CONCEPTS
QUESTIONS
HIGHER GOALS



JEE Main Chemistry

Nature of electromagnetic radiation PYQ



PRACTICE
TODAY
A BRIGHTER
TOMORROW

Better
Questions
Stronger
Concepts
Brighter Future

Subject: Chemistry

Years: 2026-2010

Total Questions: 15

About this PYQ collection

What is inside

A complete topic-wise set of **15 previous year questions** on **Nature of electromagnetic radiation** from **JEE Main (2026-2014)** and its predecessor **AIEEE (2011-2010)**, across **8 exam years**. **11 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	%
Nature of electromagnetic radiation	15	100%

Question types

TYPE	QS	%
Single-correct MCQ	6	40%
Numerical value	9	60%

Numerical-value questions have no options; all 9 are from 2021 onwards.

How these questions help you

- **Know where the marks are:** nature of electromagnetic radiation make up **15 of 15 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 – Nature of electromagnetic radiation

1. Consider two radiations of wavelengths

1. $\lambda_1 = 2000 \text{ \AA}$

2. $\lambda_2 = 6000 \text{ \AA}$

The ratio of the energies of these two radiations $\left(\frac{E_1}{E_2}\right)$ is ____ (Nearest integer).

(8 Apr 2026 | Shift 2)

2. The wavelength of photon 'A' is 400 nm. The frequency of photon 'B' is 10^{16} s^{-1} . The wave number of photon 'C' is 10^4 cm^{-1} . The correct order of energy of these photons is :

(28 Jan 2026 | Shift 2)

(A) $A > C > B$

(B) $C > B > A$

(C) $B > A > C$

(D) $A > B > C$

3. Wavenumber for a radiation having $5800 \text{ \AA}$ wavelength is $x \times 10 \text{ cm}^{-1}$. The value of x is _____. (Integer answer)

(8 Apr 2024 | Shift 2)

4. The ionization energy of sodium in kJ mol^{-1} , if electromagnetic radiation of wavelength 242 nm is just sufficient to ionize sodium atom is _____. (31 Jan 2024 | Shift 1)

5. The number of incorrect statement/s about the black body from the following is _____

(A) Emit or absorb energy in the form of electromagnetic radiation.

(B) Frequency distribution of the emitted radiation depends on temperature.

(C) At a given temperature, intensity vs frequency curve passes through a maximum value.

(D) The maximum of the intensity vs frequency curve is at a higher frequency at higher temperature compared to that at lower temperature.

(10 Apr 2023 | Shift 1)

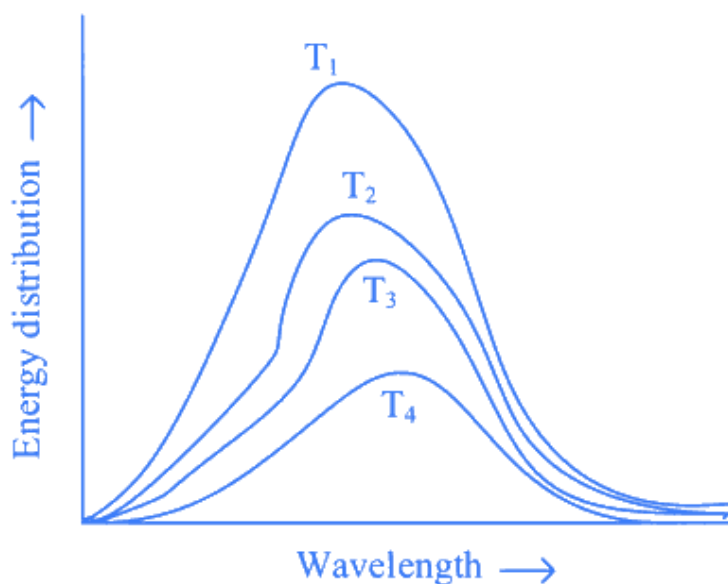
6. The energy of one mole of photons of radiation of frequency $2 \times 10^{12} \text{ Hz}$ in J mol^{-1} is _____. (Nearest integer)

[Given : $h = 6.626 \times 10^{-34} \text{ Js}$

$N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$]

(30 Jan 2023 | Shift 1)

7. Following figure shows spectrum of an ideal black body at four different temperatures. The number of correct statement/s from the following is _____.



- A. $T_4 > T_3 > T_2 > T_1$
 B. The black body consists of particles performing simple harmonic motion.
 C. The peak of the spectrum shifts to shorter wavelength as temperature increases.
 D. $\frac{T_1}{v_1} = \frac{T_2}{v_2} = \frac{T_3}{v_3} \neq \text{constant}$
 E. The given spectrum could be explained using quantisation of energy.

(24 Jan 2023 | Shift 2)

8. The energy of one mole of photons of radiation of wavelength 300 nm is
 (Given : $h = 6.63 \times 10^{-34} \text{ J s}$, $N_A = 6.02 \times 10^{23} \text{ mol}^{-1}$, $c = 3 \times 10^8 \text{ m s}^{-1}$)

(24 Jun 2022 | Shift 2)

- (A) 235 kJ mol^{-1} (B) 325 kJ mol^{-1}
 (C) 399 kJ mol^{-1} (D) 435 kJ mol^{-1}

9. A 50 watt bulb emits monochromatic red light of wavelength of 795 nm. The number of photons emitted per second by the bulb is $x \times 10^{20}$. The value of x is _____. [Given : $h = 6.63 \times 10^{-34} \text{ Js}$ and $c = 3.0 \times 10^8 \text{ ms}^{-1}$]

(1 Sept 2021 | Shift 2)

10. The number of photons emitted by a monochromatic (single frequency) infrared range finder of power 1 mW and wavelength of 1000 nm, in 0.1 second is $x \times 10^{13}$. The value of x is _____. (Nearest integer)

($h = 6.63 \times 10^{-34} \text{ Js}$, $c = 3.00 \times 10^8 \text{ ms}^{-1}$)

(27 Aug 2021 | Shift 2)

11. Electromagnetic radiation of wavelength 663 nm is just sufficient to ionise the atom of metal A. The ionization energy of metal A in kJ mol^{-1} is _____. (Rounded off to the nearest integer)

$$[h = 6.63 \times 10^{-34} \text{ Js}, c = 3.00 \times 10^8 \text{ ms}^{-1}, N_A = 6.02 \times 10^{23} \text{ mol}^{-1}]$$

(25 Feb 2021 | Shift 2)

12. The ionization energy of gaseous Na atoms is $495.5 \text{ kJ mol}^{-1}$. The lowest possible frequency of light that ionizes a sodium atom is ($h = 6.626 \times 10^{-34} \text{ Js}$, $N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$)

(19 Apr 2014 | Single slot)

- (A) $1.24 \times 10^{15} \text{ s}^{-1}$ (B) $7.50 \times 10^4 \text{ s}^{-1}$
(C) $4.76 \times 10^{14} \text{ s}^{-1}$ (D) $3.15 \times 10^{15} \text{ s}^{-1}$

13. Excited hydrogen atom emits light in the ultraviolet region at $2.47 \times 10^{15} \text{ Hz}$. With this frequency, the energy of a single photon is: ($h = 6.63 \times 10^{-34} \text{ Js}$)

(12 Apr 2014 | Single slot)

- (A) $8.041 \times 10^{-40} \text{ J}$ (B) $2.680 \times 10^{-19} \text{ J}$
(C) $1.640 \times 10^{-18} \text{ J}$ (D) $6.111 \times 10^{-17} \text{ J}$

14. A gas absorbs a photon of 355 nm and emits at two wavelengths. If one of the emissions is at 680 nm, the other is at :

(1 May 2011 | Single sitting)

- (A) 325 nm (B) 743 nm
(C) 518 nm (D) 1035 nm

15. The energy required to break one mole of Cl–Cl bonds in Cl_2 is 242 kJ mol^{-1} . The longest wavelength of light capable of breaking a single Cl – Cl bond is

$$(c = 3 \times 10^8 \text{ ms}^{-1} \text{ and } N_A = 6.02 \times 10^{23} \text{ mol}^{-1})$$

(25 Apr 2010 | Single sitting)

- (A) 594 nm (B) 640 nm
(C) 700 nm (D) 494 nm