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PHYSICS · JEE MAIN

Atoms

Previous Year Questions with answers

153 questions · **128** papers · **2002–2026** · newest paper first

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What is in this PDF: every Atoms question we hold from past JEE Main and AIEEE papers, with its options and answer. Where an answer comes from a source other than the official final key, it says so next to the answer.

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Chapter at a glance

2.5%
of Physics questions, 2019–2026

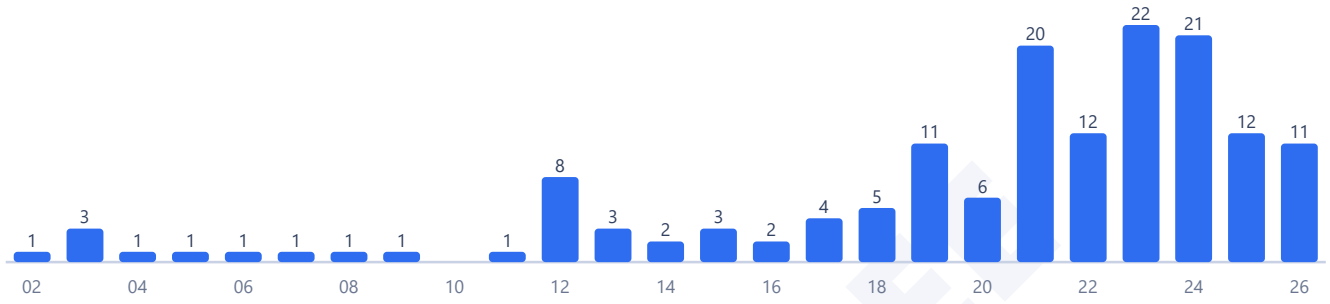
153
questions, 2002–2026

97 of 162
papers asked it, 2019–2026

119 / 34
MCQ / numerical, 2002–2026

Trend. Steady: 0.8 questions per paper in 2024–2026 against 0.7 in 2019–2023.

Questions per year



Counts are the questions we hold: 153 in 128 papers. 2 questions in this chapter came back in more than one paper.

Most-asked topics in this chapter (2002–2026)

Bohr Model	**137**
Rutherford Model	**11**
X-rays	**5**

How often it comes up

Atoms explores atomic architecture and Bohr's quantized orbital model under Unit 18: Atoms and Nuclei in the Class 12 curriculum, holding rank 24 among the 29 physics chapters with a 2.5 percent share of total physics questions. Between 2019 and 2026, candidates answered 115 questions across 162 papers, representing an average rate of 0.7 questions per sitting. The chapter featured in 97 of those 162 papers, and questions appeared every single year throughout the testing era. In the recent three-year block from 2024 to 2026, examiners set 44 questions across 58 papers, maintaining an average of 0.8 questions per shift and a 2.8 percent subject share. The chapter's share has stayed about the same when compared to the 2002 to 2018 window, which recorded 38 questions across 38 papers for a 2.8 percent share. During the 2026 examination sessions, 11 questions were presented across 19 papers, showing up in 11 separate shifts. Over the 2019 to 2026 timeline, 34 questions required numerical answers, with candidates evaluating quantum numbers, wavelength differences, and closest approach distances.

Most-asked topics

Questions from this chapter concentrate almost entirely on Bohr's quantization framework:

- **Bohr Model**: 137 questions historically, with 103 delivered between 2019 and 2026, tested up to 2026. This dominant topic explores orbital radii scaling with n squared over Z, electron orbital speeds scaling with Z over n, kinetic and potential energy relationships, angular momentum quantization, Rydberg formula calculations, and spectral series lines from Lyman to Pfund.
- **Rutherford Model**: 11 total problems, including 8 from 2019 to 2026, asked in 2026. Concepts test alpha particle scattering, distance of closest approach, impact parameter relations, and nuclear dimension estimations.
- **X-rays**: 5 lifetime questions, with 4 appearing between 2019 and 2026, last asked in 2023. Questions assess continuous and characteristic X-ray generation mechanisms and Duane-Hunt minimum cutoff wavelengths.

What the questions look like

JEE Main tests atoms through structured algebraic substitutions and orbital proportionality rules:

- **Orbital quantum number from energy fractions**: An electron occupies a stationary Bohr orbit with total energy equal to a specified decimal fraction of the ground state energy. Students determine the principal quantum number n and evaluate orbital angular momentum.
- **Distance of closest approach in alpha scattering**: High-energy alpha particles fired head-on toward heavy gold nuclei convert initial kinetic energy entirely into electrostatic potential energy at the turning point.
- **Spectral wavelength differences**: Given the shortest wavelength of the Lyman series, students apply the Rydberg formula to calculate the difference between the longest wavelengths of the Balmer and Paschen series.
- **Orbital magnetic field scaling**: Comparing the magnetic field generated at the nucleus by circulating orbital electrons across different principal quantum states.

How to practise it

Memorize the power dependencies of all Bohr quantities with respect to principal quantum number n and nuclear charge Z. Radius scales as n squared over Z, velocity scales as Z over n, orbital time period scales as n cubed over Z squared, and total energy scales as minus Z squared over n squared.

Be proficient with energy relations: potential energy is always negative and twice the total energy, while kinetic energy is positive and equals the absolute value of total energy. When an electron transitions to a lower energy state, kinetic energy increases while potential energy decreases by twice that amount.

For hydrogen spectral series, know the transition limits cold. The shortest wavelength of any series corresponds to an electron falling from infinity, while the longest wavelength corresponds to an transition from the immediately adjacent upper level.

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Q1 JEE Main 2026 · 6 Apr · Shift 1 MCQ

The ratio of momentum of the photons of the 1st and 2nd line of Balmer series of Hydrogen atoms is α/β. The possible values of α and β are:-

(A) 27 and 20
(B) 3 and 16
(C) 5 and 36
(D) 20 and 27

Answer: (D) 20 and 27 · Official NTA final key

Q2 JEE Main 2026 · 5 Apr · Shift 1 MCQ

In the hydrogen atom, the electron makes a transition from the higher orbit (i) to a lower orbit (f). The ratio of the radius of the orbits in given by $r_i : r_f = 16 : 4$. The wavelength of photon emitted due to this transition is _____ nm.
(Given Rydberg constant = 1.0973×10^7 /m)

(A) 121
(B) 242
(C) 486
(D) 974

Answer: (C) 486 · Official NTA final key

Q3 JEE Main 2026 · 4 Apr · Shift 2 MCQ

In Rutherford's alpha-particle scattering experiment, only a few alpha particles rebound back because

A. The size of gold nucleus is very small as compared to the size of gold atom.

B. Alpha particle and gold nucleus have equal charge.

C. The impact parameter is minimum for a few alpha particles.

D. A few alpha particles have very high kinetic energy.

E. Only a few alpha particles undergo head-on collision with the nuclei.

Choose the correct answer from the options given below:

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

Answer: (D) A, C, E Only · Official NTA final key

Q4 JEE Main 2026 · 2 Apr · Shift 1 MCQ

Angular momentum of an electron in a hydrogen atom is $\frac{3h}{\pi}$, then the energy of the electron is _____ eV.

(A) -1.51
(B) -0.85
(C) -0.38
(D) -0.28

Answer: (C) -0.38 · Official NTA final key

Q5 JEE Main 2026 · 2 Apr · Shift 2 Numerical

Using Bohr's model, calculate the ratio of the magnetic fields generated due to the motion of the electrons in the 2nd and 4th orbits of hydrogen atom _____.

Numerical value type: the answer is a number.

Answer: 32. · Official NTA final key

Q6 JEE Main 2026 · 24 Jan · Shift 1 MCQ

Two electrons are moving in orbits of two hydrogen like atoms with speeds 3×10^5 m/s and 2.5×10^5 m/s respectively. If the radii of these orbits are nearly same then the possible order of energy states are _____ respectively.

(A) 10 and 12
(B) 8 and 10
(C) 6 and 5
(D) 9 and 8

Answer: (C) 6 and 5 · Official NTA final key

Q7 JEE Main 2026 · 23 Jan · Shift 1 MCQ

In hydrogen atom spectrum, ($R \rightarrow$ Rydberg's constant)

A. the maximum wavelength of the radiation of Lyman series is $\frac{4}{3R}$

B. the Balmer series lies in the visible region of the spectrum

C. the minimum wavelength of the radiation of Paschen series is $\frac{9}{R}$

D. the minimum wavelength of Lyman series is $\frac{5}{4R}$

Choose the **correct** answer from the options given below :

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

Answer: (A) A, B and C Only · Official NTA final key

Q8 JEE Main 2026 · 22 Jan · Shift 1 MCQ

7.9 MeV α-particle scatters from a target material of atomic number 79. From the given data the estimated diameter of nuclei of the target material is (approximately) _____ m.

$\left[\frac{1}{4\pi\epsilon_0} = 9 \times 10^9\ \mathrm{Nm^2/C^2}$ and electron charge $= 1.6 \times 10^{-19}$ C$\right]$

(A) 1.69×10^{-12}
(B) 1.44×10^{-13}
(C) 2.88×10^{-14}
(D) 5.76×10^{-14}

Answer: (D) 5.76×10^{-14} · Official NTA final key

Q9 JEE Main 2026 · 22 Jan · Shift 2 MCQ

The smallest wavelength of Lyman series is 91 nm. The difference between the largest wavelengths of Paschen and Balmer series is nearly _____ nm.

(A) 1784
(B) 1217
(C) 1875
(D) 1550

Answer: (B) 1217 · Official NTA final key

Q10 JEE Main 2026 · 21 Jan · Shift 1 MCQ

If an alpha particle with energy 7.7 MeV is bombarded on a thin gold foil, the closest distance from nucleus it can reach is _____ m. (Atomic number of gold = 79 and $\frac{1}{4\pi\epsilon_o} = 9 \times 10^9$ in SI units)

(A) 2.95×10^{-16}
(B) 3.85×10^{-14}
(C) 2.95×10^{-14}
(D) 3.85×10^{-16}

Answer: (C) 2.95×10^{-14} · Official NTA final key

Q11 JEE Main 2026 · 21 Jan · Shift 2 MCQ

The energy of an electron in an orbit of the Bohr's atom is $-0.04E_0$ eV where E_0 is the ground state energy. If L is the angular momentum of the electron in this orbit and h is the Planck's constant, then $\frac{2\pi L}{h}$ is _____ :

(A) 4
(B) 6
(C) 5
(D) 2

Answer: (C) 5 · Official NTA final key

Q12 JEE Main 2025 · 7 Apr · Shift 1 MCQ

For a hydrogen atom, the ratio of the largest wavelength of Lyman series to that of the Balmer series is

(A) 3: 4
(B) 5: 27
(C) 27: 5
(D) 5: 36

Answer: (B) 5: 27 · Key from source paper

Q13 JEE Main 2025 · 7 Apr · Shift 1 MCQ

In a hydrogen like ion, the energy difference between the 2nd excitation energy state and ground is 108.8 eV. The atomic number of the ion is:

(A) 4
(B) 1
(C) 2
(D) 3

Answer: (D) 3 · Key from source paper

Q14 JEE Main 2025 · 4 Apr · Shift 1 MCQ

Considering the Bohr model of hydrogen like atoms, the ratio of the radius of 5th orbit of the electron in Li^{2+} and He^{+} is

(A) $\frac{4}{9}$
(B) $\frac{3}{2}$
(C) $\frac{2}{3}$
(D) $\frac{9}{4}$

Answer: (C) $\frac{2}{3}$ · Key from source paper

Q15 JEE Main 2025 · 4 Apr · Shift 2 MCQ

Given below are two statements :

Statement (I): The dimensions of Planck's constant and angular momentum are same.

Statement (II) : In Bohr's model electron revolve around the nucleus only in those orbits for which angular momentum is integral multiple of Planck's constant.

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

(A) Both Statement I and Statement II are incorrect
(B) Statement I is incorrect but Statement II is correct
(C) Both Statement I and Statement II are correct
(D) Statement I is correct but Statement II is incorrect

Answer: (D) Statement I is correct but Statement II is incorrect · Key from source paper

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Q16 JEE Main 2025 · 3 Apr · Shift 2 MCQ

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

Assertion A : The Bohr model is applicable to hydrogen and hydrogen-like atoms only.

Reason R : The formulation of Bohr model does not include repulsive force between electrons.

In the light of the above statements, choose the correct answer from the options given below

(A) **A** is true but **R** is false
(B) Both **A** and **R** are true and **R** is the correct explanation of **A**
(C) Both **A** and **R** are true but **R** is NOT the correct explanation of **A**
(D) **A** is false but **R** is true

Answer: (B) Both A and R are true and R is the correct explanation of A · Key from source paper

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Q17 JEE Main 2025 · 3 Apr · Shift 2 Numerical

An electron in the hydrogen atom initially in the fourth excited state makes a transition to n^{th} energy state by emitting a photon of energy 2.86 eV . The integer value of n will be _____ .

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q18 JEE Main 2025 · 2 Apr · Shift 1 MCQ

Considering Bohr's atomic model for hydrogen atom :

(A) the energy of H atom in ground state is same as energy of He^+ ion in its first excited state.

(B) the energy of H atom in ground state is same as that for Li^{++} ion in its second excited state.

(C) the energy of H atom in its ground state is same as that of He^+ ion for its ground state.

(D) the energy of He^+ ion in its first excited state is same as that for Li^{++} ion in its ground state.

Choose the correct answer from the options given below :

A (A), (B) only
B (A), (D) only
C (B), (D) only
D (A), (C) only

Answer: (A) (A), (B) only · Key from source paper

Q19 JEE Main 2025 · 2 Apr · Shift 2 MCQ

Assuming the validity of Bohr's atomic model for hydrogen like ions the radius of Li^{++} ion in its ground state is given by $\frac{1}{X}a_0$, where X = _____ (Where a_0 is the first Bohr's radius.)

A 1
B 3
C 2
D 9

Answer: (B) 3 · Key from source paper

Q20 JEE Main 2025 · 29 Jan · Shift 2 MCQ

The number of spectral lines emitted by atomic hydrogen that is in the 4th energy level, is

A 3
B 1
C 6
D 0

Answer: (C) 6 · Key from source paper

Q21 JEE Main 2025 · 28 Jan · Shift 2 MCQ

The frequency of revolution of the electron in Bohr's orbit varies with n, the principal quantum number as

(A) $\frac{1}{n^4}$
(B) $\frac{1}{n^2}$
(C) $\frac{1}{\mathrm{n}}$
(D) $\frac{1}{n^3}$

Answer: (D) $\frac{1}{n^3}$ · Key from source paper

Q22 JEE Main 2025 · 24 Jan · Shift 1 MCQ

During the transition of electron from state A to state C of a Bohr atom, the wavelength of emitted radiation is 2000$\mathring{A}$ and it becomes 6000$\mathring{A}$ when the electron jumps from state B to state C. Then the wavelength of the radiation emitted during the transition of electrons from state A to state B is

(A) 4000$\mathring{A}$
(B) 2000$\mathring{A}$
(C) 3000$\mathring{A}$
(D) 6000$\mathring{A}$

Answer: (C) 3000$\mathring{A}$ · Key from source paper

Q23 JEE Main 2025 · 22 Jan · Shift 2 MCQ

An electron projected perpendicular to a uniform magnetic field B moves in a circle. If Bohr's quantization is applicable, then the radius of the electronic orbit in the first excited state is :

(A) $\sqrt{\frac{\mathrm{h}}{\pi \mathrm{eeB}}}$
(B) $\sqrt{\frac{2h}{\pi eB}}$
(C) $\sqrt{\frac{h}{2\pi eB}}$
(D) $\sqrt{\frac{4\,\mathrm{h}}{\pi eB}}$

Answer: (A) $\sqrt{\frac{\mathrm{h}}{\pi \mathrm{eeB}}}$ · Key from source paper

Q24 JEE Main 2024 · 9 Apr · Shift 2 MCQ

A hydrogen atom in ground state is given an energy of 10.2eV. How many spectral lines will be emitted due to transition of electrons?

(A) 6
(B) 3
(C) 10
(D) 1

Answer: (D) 1 · Key from source paper

Q25 JEE Main 2024 · 8 Apr · Shift 1 · Numerical

In an alpha particle scattering experiment distance of closest approach for the α particle is 4.5×10^{-14} m. If target nucleus has atomic number 80 , then maximum velocity of α - particle is _____ $\times 10^5$ m/s approximately. $\left(\frac{1}{4\pi\epsilon_0} = 9 \times 10^9$ SI unit, mass of α particle = 6.72×10^{-27} kg)

Numerical value type: the answer is a number.

Answer: 156. · Key from source paper

Q26 JEE Main 2024 · 6 Apr · Shift 1 · MCQ

The ratio of the shortest wavelength of Balmer series to the shortest wavelength of Lyman series for hydrogen atom is :

(A) 4 : 1
(B) 1 : 4
(C) 2 : 1
(D) 1 : 2

Answer: (A) 4 : 1 · Key from source paper

Q27 JEE Main 2024 · 6 Apr · Shift 1 · Numerical

Radius of a certain orbit of hydrogen atom is 8.48$\tilde{A}$ . . . . If energy of electron in this orbit is E/x. then x = _____ (Given a_0 = 0.529$\tilde{A}$ . . . , E = energy of electron in ground state).

Numerical value type: the answer is a number.

Answer: 16. · Key from source paper

Q28 JEE Main 2024 · 6 Apr · Shift 2 · MCQ

The longest wavelength associated with Paschen series is : (Given $R_H = 1.097 \times 10^7$SI unit)

(A) 3.646×10^{-6} m
(B) 1.876×10^{-6} m
(C) 2.973×10^{-6} m
(D) 1.094×10^{-6} m

Answer: (B) 1.876×10^{-6} m · Key from source paper

Q29 JEE Main 2024 · 6 Apr · Shift 2 · Numerical

In Franck-Hertz experiment, the first dip in the current-voltage graph for hydrogen is observed at 10.2 V. The wavelength of light emitted by hydrogen atom when excited to the first excitation level is _____ nm. (Given hc = 1245eVnm, e = 1.6×10^{-19}C).

Numerical value type: the answer is a number.

Answer: 122. · Key from source paper

Q30 JEE Main 2024 · 5 Apr · Shift 1 MCQ

An electron rotates in a circle around a nucleus having positive charge Ze. Correct relation between total energy (E) of electron to its potential energy (U) is :

(A) E = U
(B) 2E = U
(C) 2E = 3U
(D) E = 2U

Answer: (B) 2E = U · Key from source paper

Q31 JEE Main 2024 · 5 Apr · Shift 2 MCQ

The angular momentum of an electron in a hydrogen atom is proportional to : (Where r is the radius of orbit of electron)

(A) r
(B) $\sqrt{r}$
(C) $\frac{1}{\sqrt{r}}$
(D) $\frac{1}{r}$

Answer: (B) $\sqrt{r}$ · Key from source paper

Q32 JEE Main 2024 · 5 Apr · Shift 2 Numerical

The shortest wavelength of the spectral lines in the Lyman series of hydrogen spectrum is 915 Å .... The longest wavelength of spectral lines in the Balmer series will be _____ Å ....

Numerical value type: the answer is a number.

Answer: 6588. · Key from source paper

Q33 JEE Main 2024 · 4 Apr · Shift 1 Numerical

A hydrogen atom changes its state from $n = 3$ to $n = 2$. Due to recoil, the percentage change in the wave length of emitted light is approximately 1×10^{-n}. The value of n is _____. [Given Rhc = 13.6eV, hc = 1242eVnm, h = 6.6×10^{-34} J s mass of the hydrogenatom = 1.6×10^{-27} kg]

Numerical value type: the answer is a number.

Answer: 7. · Key from source paper

Q34 JEE Main 2024 · 4 Apr · Shift 2 MCQ

According to Bohr's theory, the moment of momentum of an electron revolving in 4th orbit of hydrogen atom is:

(A) $\frac{h}{\pi}$
(B) $\frac{h}{2\pi}$
(C) $8\frac{h}{\pi}$
(D) $2\frac{h}{\pi}$

Answer: (D) $2\frac{h}{\pi}$ · Key from source paper

Q35 JEE Main 2024 · 1 Feb · Shift 1 MCQ

The minimum energy required by a hydrogen atom in ground state to emit radiation in Balmer series is nearly :

(A) 1.5 eV
(B) 13.6 eV
(C) 1.9 eV
(D) 12.1 eV

Answer: (D) 12.1 eV · Key from source paper

Q36 JEE Main 2024 · 1 Feb · Shift 2 Numerical

A particular hydrogen - like ion emits the radiation of frequency 3×10^{15} Hz when it makes transition from $n = 2$ to $n = 1$. The frequency of radiation emitted in transition from $n = 3$ to $n = 1$ is $\frac{x}{9} \times 10^{15}$ Hz, when x = _____.

Numerical value type: the answer is a number.

Answer: 32. · Key from source paper

Q37 JEE Main 2024 · 31 Jan · Shift 1 MCQ

If the wavelength of the first member of Lyman series of hydrogen is λ. The wavelength of the second member will be

(A) $\frac{27}{32}\lambda$
(B) $\frac{32}{27}\lambda$
(C) $\frac{27}{5}\lambda$
(D) $\frac{5}{27}\lambda$

Answer: (A) $\frac{27}{32}\lambda$ · Key from source paper

Q38 JEE Main 2024 · 30 Jan · Shift 1 MCQ

The ratio of the magnitude of the kinetic energy to the potential energy of an electron in the 5th excited state of a hydrogen atom is :

(A) 4
(B) $\frac{1}{4}$
(C) $\frac{1}{2}$
(D) 1

Answer: (C) $\frac{1}{2}$ · Key from source paper

Q39 JEE Main 2024 · 30 Jan · Shift 1 Numerical

An electron of hydrogen atom on an excited state is having energy $E_n = -0.85$ eV. The maximum number of allowed transitions to lower energy level is _____.

Numerical value type: the answer is a number.

Answer: 6. · Key from source paper

Q40 JEE Main 2024 · 29 Jan · Shift 1 Numerical

When a hydrogen atom going from $n = 2$ to $n = 1$ emits a photon, its recoil speed is $\frac{x}{5}$ m s^{-1}. Where $x =$ _____. (Use: mass of hydrogen atom = 1.6×10^{-27} kg, charge of electron $e = 1.6 \times 10^{-19}$ C)

Numerical value type: the answer is a number.

Answer: 17. · Key from source paper

Q41 JEE Main 2024 · 29 Jan · Shift 2 MCQ

Given below are two statements:

Statement I: Most of the mass of the atom and all its positive charge are concentrated in a tiny nucleus and the electrons revolve around it, is Rutherford's model.

Statement II: An atom is a spherical cloud of positive charges with electrons embedded in it, is a special case of Rutherford's model.

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

(A) Both statement I and statement II are false
(B) Statement I is false but statement II is true
(C) Statement I is true but statement II is false
(D) Both statement I and statement II are true

Answer: (C) Statement I is true but statement II is false · Key from source paper

Q42 JEE Main 2024 · 29 Jan · Shift 2 Numerical

Hydrogen atom is bombarded with electrons accelerated through a potential difference of V, which causes excitation of hydrogen atoms. If the experiment is being formed at $T = 0$ K. The minimum potential difference needed to observe any Balmer series lines in the emission spectra will be $\frac{\alpha}{10}$ V, where $\alpha =$ _____. (Write the value to the nearest integer)

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Numerical value type: the answer is a number.

Answer: 121. · Key from source paper

Q43 JEE Main 2024 · 27 Jan · Shift 1 MCQ

The radius of third stationary orbit of electron for Bohr's atom is R. The radius of fourth stationary orbit will be:

(A) $\frac{4}{3}R$
(B) $\frac{16}{9}R$
(C) $\frac{3}{4}R$
(D) $\frac{9}{16}R$

Answer: (B) $\frac{16}{9}R$ · Key from source paper

Q44 JEE Main 2024 · 27 Jan · Shift 2 Numerical

If Rydberg's constant is R, the longest wavelength of radiation in Paschen series will be $\frac{\alpha}{7R}$, where $\alpha =$ _____.

Numerical value type: the answer is a number.

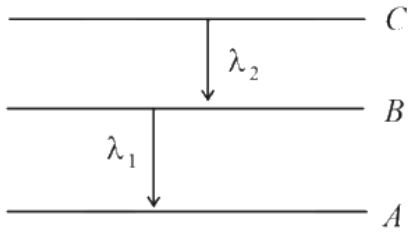
Answer: 144. · Key from source paper

Q45 JEE Main 2023 · 15 Apr · Shift 1 Numerical

As per given figure A, B and C are the first, second and third excited energy levels of hydrogen atom respectively. If the ratio of the two wavelengths ($i.e.$ $\frac{\lambda_1}{\lambda_2}$) is $\frac{7}{4n}$, then the value of n will be

(see the figure above)

Q30. As per given figure A, B and C are the first, second and third excited energy levels of hydrogen atom respectively. If the ratio of the two wavelengths $\left(i.e.\ \frac{\lambda_1}{\lambda_2}\right)$ is $\frac{7}{4n}$, then the value of n will be



Numerical value type: the answer is a number.

Answer: 5. · Key from source paper

Q46 JEE Main 2023 · 13 Apr · Shift 1 Numerical

The radius of 2nd orbit of He^+ of Bohr's model is r_1 and that of fourth orbit of Be^{3+} is represented as r_2. Now the ratio $\frac{r_2}{r_1}$ is $x : 1$. The value of x is _____.

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q47 JEE Main 2023 · 12 Apr · Shift 1 MCQ

A 12.5 eV electron beam is used to bombard gaseous hydrogen at room temperature. The number of spectral lines emitted will be:

(A) 1
(B) 4
(C) 2
(D) 3

Answer: (D) 3 · Key from source paper

Q48 JEE Main 2023 · 11 Apr · Shift 1 Numerical

A monochromatic light is incident on a hydrogen sample in ground state. Hydrogen atoms absorb a fraction of light and subsequently emit radiation of six different wavelengths. The frequency of incident light is $x \times 10^{15}$ Hz. The value of x is _____.
(Given $h = 4.25 \times 10^{-15}$ eVs)

Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q49 JEE Main 2023 · 11 Apr · Shift 2 MCQ

The energy of He^{+} ion in its first state is, (The ground state energy for the Hydrogen atom -13.6 eV):

(A) -27.2 eV
(B) -3.4 eV
(C) -13.6 eV
(D) -54.4 eV

Answer: (C) -13.6 eV · Key from source paper

Q50 JEE Main 2023 · 10 Apr · Shift 1 MCQ

The angular momentum for the electron in Bohr's orbit is L. If the electron is assumed to revolve in second orbit of hydrogen atom, then the change in angular momentum will be

(A) Zero
(B) $2L$
(C) L
(D) $\frac{L}{2}$

Answer: (C) L · Key from source paper

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Q51 JEE Main 2023 · 10 Apr · Shift 2 · Numerical

If 917 Å be the lowest wavelength of Lyman series then the lowest wavelength of Balmer series will be _____ Å.

Numerical value type: the answer is a number.

Answer: 3668. · Key from source paper

Q52 JEE Main 2023 · 8 Apr · Shift 2 · MCQ

The waves emitted when a metal target is bombarded with high energy electrons are

(A) Microwaves
(B) Infrared rays
(C) X-rays
(D) Radio Waves

Answer: (C) X-rays · Key from source paper

Q53 JEE Main 2023 · 8 Apr · Shift 2 · Numerical

The ratio of wavelength of spectral lines H_α and H_β in the Balmer series is $\frac{x}{20}$. The value of x is _____ .

Numerical value type: the answer is a number.

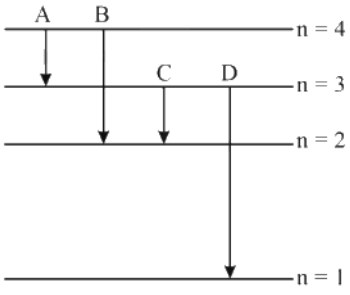
Answer: 27. · Key from source paper

Q54 JEE Main 2023 · 6 Apr · Shift 1 · MCQ

The energy levels of an hydrogen atom are shown below. The transition corresponding to emission of shortest wavelength is

(see the figure above)

Q17. The energy levels of an hydrogen atom are shown below. The transition corresponding to emission of shortest wavelength is



(1) D
(2) A
(3) B
(4) C

(A) D
(B) A
(C) B
(D) C

Answer: (A) D · Key from source paper

Q55 JEE Main 2023 · 6 Apr · Shift 1 Numerical

The radius of fifth orbit of Li^{++} is _____ $\times 10^{-12}$ m. Take: radius of hydrogen atom $= 0.51$ Å

Numerical value type: the answer is a number.

Answer: 425. · Key from source paper

Q56 JEE Main 2023 · 6 Apr · Shift 2 MCQ

A small particle of mass m moves in such a way that its potential energy $U = \frac{1}{2}m\omega^2 r^2$ where ω is constant and r is the distance of the particle from origin. Assuming Bohr's quantization of momentum and circular orbit, the radius of nth orbit will be proportional to

(A) $\sqrt{n}$
(B) $\frac{1}{n}$
(C) n^2
(D) n

Answer: (A) $\sqrt{n}$ · Key from source paper

Q57 JEE Main 2023 · 6 Apr · Shift 2 Numerical

Experimentally it is found that 12.8 eV energy is required to separate a hydrogen atom into a proton and an electron. So the orbital radius of the electron in a hydrogen atom is $\frac{9}{x} \times 10^{-10}$ m. The value of the x is: _____ .
(1 eV $= 1.6 \times 10^{-19}$ J, $\frac{1}{4\pi\varepsilon_0} = 9 \times 10^9 \frac{\mathrm{Nm}^2}{\mathrm{C}^2}$ and electronic charge $= 1.6 \times 10^{-19}$ C)

Numerical value type: the answer is a number.

Answer: 16. · Key from source paper

Q58 JEE Main 2023 · 1 Feb · Shift 1 Numerical

A light of energy 12.75 eV is incident on a hydrogen atom in its ground state. The atom absorbs the radiation and reaches to one of its excited states. The angular momentum of the atom in the excited state is $\frac{x}{\pi} \times 10^{-17}$ eVs. The value of x is _____ (use h = 4.14 $\times 10^{-15}$ eVs, c = 3 $\times 10^8$ m s^{-1})

Numerical value type: the answer is a number.

Answer: 828. · Key from source paper

Q59 JEE Main 2023 · 1 Feb · Shift 2 MCQ

An electron of a hydrogen like atom, having Z = 4, jumps from 4th energy state to 2nd energy state, The energy released in this process, will be: (Given Rch = 13.6 eV) Where R = Rydberg constant c = Speed of light in vacuum h = Planck's constant

(A) 13.6 eV
(B) 10.5 eV
(C) 3.4 eV
(D) 40.8 eV

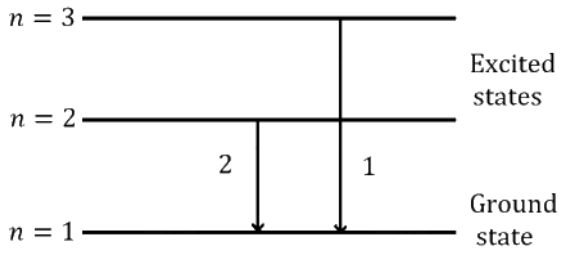
Answer: (D) 40.8 eV · Key from source paper

Q60 JEE Main 2023 · 31 Jan · Shift 1 Numerical

For hydrogen atom, λ_1 and λ_2 are the wavelengths corresponding to the transitions 1 and 2 respectively as shown in figure. The ratio of λ_1 and λ_2 is $\frac{x}{32}$. The value of x is _____.

(see the figure above)

Q30. For hydrogen atom, λ_1 and λ_2 are the wavelengths corresponding to the transitions 1 and 2 respectively as shown in figure. The ratio of λ_1 and λ_2 is $\frac{x}{32}$. The value of x is _____.



Numerical value type: the answer is a number.

Answer: 27. · Key from source paper

Q61 JEE Main 2023 · 31 Jan · Shift 2 MCQ

The radius of electron's second stationary orbit in Bohr's atom is R. The radius of 3rd orbit will be

(A) $\frac{R}{3}$
(B) 2.25 R
(C) $3R$
(D) $9R$

Answer: (B) 2.25 R · Key from source paper

Q62 JEE Main 2023 · 31 Jan · Shift 2 Numerical

If the binding energy of ground state electron in a hydrogen atom is 13.6 eV, then, the energy required to remove the electron from the second excited state of Li^{2+} will be: $x \times 10^{-1}$ eV. The value of x is _____.

Numerical value type: the answer is a number.

Answer: 136. · Key from source paper

Q63 JEE Main 2023 · 30 Jan · Shift 1 MCQ

Speed of an electron in Bohr's 7th orbit for Hydrogen atom is 3.6×10^6 m s^{-1}. The corresponding speed of the electron in 3rd orbit, in m s^{-1} is :

(A) 1.8×10^6

(B) 7.5×10^6

(C) 3.6×10^6

(D) 8.4×10^6

Answer: (D) 8.4×10^6 · Key from source paper

Q64 JEE Main 2023 · 25 Jan · Shift 1 Numerical

The wavelength of the radiation emitted is λ_0 when an electron jumps from the second excited state to the first excited state of hydrogen atom. If the electron jumps from the third excited state to the second orbit of the hydrogen atom, the wavelength of the radiation emitted will be $\frac{20}{x}\lambda_0$. The value of x is _____.

Numerical value type: the answer is a number.

Answer: 27. · Key from source paper

Q65 JEE Main 2023 · 25 Jan · Shift 2 MCQ

The energy levels of an atom is shown is figure.

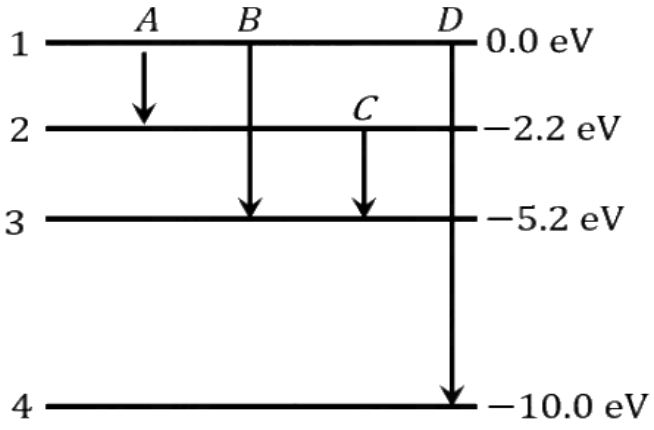
(see the figure above)

Which one of these transitions will result in the emission of a photon of wavelength 124.1 nm?

Given ($h = 6.62 \times 10^{-34}$ J s)

EdLoop JEE

Q29. The energy levels of an atom is shown is figure.



Which one of these transitions will result in the emission of a photon of wavelength 124. 1 nm? Given ($h = 6.62 \times 10^{-34}$ J s)

(1) B
(2) A
(3) C
(4) D

(A) B
(B) A
(C) C
(D) D

Answer: (D) D · Key from source paper

Q66 JEE Main 2023 · 24 Jan · Shift 2 MCQ

A photon is emitted in transition from $n = 4$ to $n = 1$ level in hydrogen atom. The corresponding wavelength for this transition is (given, $h = 4 \times 10^{-15}$ eV s)

(A) 941 nm
(B) 974 nm
(C) 99.3 nm
(D) 94.1 nm

Answer: (D) 94.1 nm · Key from source paper

Q67 JEE Main 2022 · 29 Jul · Shift 1 MCQ

Find the ratio of energies of photons produced due to transition of an election of hydrogen atom from its(i) second permitted energy level to the first level, and (ii) the highest permitted energy level to the first permitted level.

(A) 3 : 4
(B) 4 : 3
(C) 1 : 4
(D) 4 : 1

Answer: (A) 3 : 4 · Key from source paper

Q68 JEE Main 2022 · 26 Jul · Shift 1 Numerical

In a hydrogen spectrum λ be the wavelength of first transition line of Lyman series. The wavelength difference will be "aλ" between the wavelength of 3rd transition line of Paschen series and that of 2nd transition line of Balmer Series where a = _____ .

Numerical value type: the answer is a number.

Answer: 5. · Key from source paper

Q69 JEE Main 2022 · 25 Jul · Shift 1 MCQ

The momentum of an electron revolving in n^{th} orbit is given by : (Symbols have their usual meanings)

(A) $\frac{nh}{2\pi r}$
(B) $\frac{nh}{2r}$
(C) $\frac{nh}{2\pi}$
(D) $\frac{2\pi r}{nh}$

Answer: (A) $\frac{nh}{2\pi r}$ · Key from source paper

Q70 JEE Main 2022 · 25 Jul · Shift 2 MCQ

Hydrogen atom from excited state comes to the ground by emitting a photon of wavelength λ. The value of principal quantum number n of the excited state will be :
(R : Rydberg constant)

(A) $\sqrt{\frac{\lambda R}{\lambda - 1}}$
(B) $\sqrt{\frac{\lambda R}{\lambda R - 1}}$
(C) $\sqrt{\frac{\lambda}{\lambda R - 1}}$
(D) $\sqrt{\frac{\lambda R^2}{\lambda R - 1}}$

Answer: (B) $\sqrt{\frac{\lambda R}{\lambda R - 1}}$ · Key from source paper

Q71 JEE Main 2022 · 25 Jul · Shift 2 Numerical

$\frac{x}{x+4}$ is the ratio of energies of photons produced due to transition of an electron of hydrogen atom from its
(i) third permitted energy level to the second level and

(ii) the highest permitted energy level to the second level.
The value of x will be

Numerical value type: the answer is a number.

Answer: 5. · Key from source paper

Q72 JEE Main 2022 · 29 Jun · Shift 1 Numerical

$\sqrt{d_1}$ and $\sqrt{d_2}$ are the impact parameters corresponding to scattering angles 60° and 90° respectively, when an α particle is approaching a gold nucleus. For $d_1 = xd_2$, the value of x will be _____.

Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q73 JEE Main 2022 · 27 Jun · Shift 1 MCQ

A hydrogen atom in its ground state absorbs $10.2\ \mathrm{eV}$ of energy. The angular momentum of electron of the hydrogen atom will increase by the value of (Given, Planck's constant $= 6.6 \times 10^{-34}$ Js).

(A) 2.10×10^{-34} Js
(B) 1.05×10^{-34} Js
(C) 3.15×10^{-34} Js
(D) 4.2×10^{-34} Js

Answer: (B) 1.05×10^{-34} Js · Key from source paper

Q74 JEE Main 2022 · 27 Jun · Shift 1 Numerical

A beam of monochromatic light is used to excite the electron in Li^{++} from the first orbit to the third orbit. The wavelength of monochromatic light is found to be $x \times 10^{-10}$ m. The value of x is _____ .
[Given $hc = 1242\ \mathrm{eV\ nm}$]

Numerical value type: the answer is a number.

Answer: 114. · Key from source paper

Q75 JEE Main 2022 · 27 Jun · Shift 2 MCQ

Given below are two statements
Statement I: In hydrogen atom, the frequency of radiation emitted when electron jumps from lower energy orbit (E_1) to higher energy orbit (E_2), is given as $hf = \mathrm{E}_1 - \mathrm{E}_2$
Statement II: The jumping of electron from higher energy orbit (E_2) to lower energy orbit (E_1) is associated with frequency of radiation given as $f = \frac{(\mathrm{E}_2 - \mathrm{E}_1)}{h}$. This condition is Bohr's frequency condition.
In the light of the above statements, choose the correct answer from the options given below:

(A) Both statement I and statement II are true.
(B) Both statement I and statement II are false.
(C) Statement I is correct but statement II is false.
(D) Statement I is incorrect but statement II is true.

Answer: (D) Statement I is incorrect but statement II is true. · Key from source paper

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Q76 JEE Main 2022 · 25 Jun · Shift 1 MCQ

The ratio for the speed of the electron in the 3rd orbit of He^{+} to the speed of the electron in the 3rd orbit of hydrogen atom will be :

(A) $1:1$
(B) $1:2$
(C) $4:1$
(D) $2:1$

Answer: (D) $2:1$ · Key from source paper

Q77 JEE Main 2022 · 24 Jun · Shift 1 MCQ

Choose the correct option from the following options given below :

(A) In the ground state of Rutherford's model electrons are in stable equilibrium. While in Thomson's model electrons always experience a net-force.
(B) An atom has a nearly continuous mass distribution in a Rutherford's model but has a highly non-uniform mass distribution in Thomson's model
(C) A classical atom based on Rutherford's model is doomed to collapse.
(D) The positively charged part of the atom possesses most of the mass in Rutherford's model but not in Thomson's model.

Answer: (C) A classical atom based on Rutherford's model is doomed to collapse. · Key from source paper

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Q78 JEE Main 2022 · 24 Jun · Shift 2 MCQ

In Bohr's atomic model of hydrogen, let K, P and E are the kinetic energy, potential energy and total energy of the electron respectively. Choose the correct option when the electron undergoes transitions to a higher level :

(A) All K, P and E increase.
(B) K decreases, P and E increase.
(C) P decreases, K and E increase.
(D) K increases, P and E decrease

Answer: (B) K **decreases,** P **and** E **increase.** · Key from source paper

Q79 JEE Main 2021 · 31 Aug · Shift 2 MCQ

A free electron of 2.6 eV energy collides with a H^+ ion. This results in the formation of a hydrogen atom in the first excited state and a photon is released. Find the frequency of the emitted photon. $h = 6.6 \times 10^{-34}$ J s

(A) 9.0×10^{27} MHz
(B) 1.45×10^{9} MHz
(C) 0.19×10^{15} MHz
(D) 1.45×10^{16} MHz

Answer: (B) 1.45×10^{9} **MHz** · Key from source paper

Q80 JEE Main 2021 · 27 Aug · Shift 2 Numerical

X different wavelength may be observed in the spectrum from a hydrogen sample if the atoms are excited to states with principal quantum number $n = 6$? The value of X is

Numerical value type: the answer is a number.

Answer: 15. · Key from source paper

Q81 JEE Main 2021 · 26 Aug · Shift 1 MCQ

A particular hydrogen like ion emits radiation of frequency 2.92×10^{15} Hz when it makes transition from $n = 3$ to $n = 1$. The frequency in Hz of radiation emitted in transition from $n = 2$ to $n = 1$ will be:

(A) 6.57×10^{15}
(B) 2.46×10^{15}
(C) 0.44×10^{15}
(D) 4.38×10^{15}

Answer: (B) 2.46×10^{15} · Key from source paper

Q82 JEE Main 2021 · 27 Jul · Shift 1 Numerical

In Bohr's atomic model, the electron is assumed to revolve in a circular orbit of radius 0.5 Å. If the speed of electron is 2.2×10^{6} m s^{-1}. Then the current associated with the electron will be _____ $\times 10^{-2}$ mA.
[Take π as $\frac{22}{7}$]

Numerical value type: the answer is a number.

Answer: 112. · Key from source paper

Q83 JEE Main 2021 · 27 Jul · Shift 2 MCQ

An electron and proton are separated by a large distance. The electron starts approaching the proton with energy 3 eV. The proton captures the electrons and forms a hydrogen atom in second excited

state. The resulting photon is incident on a photosensitive metal of threshold wavelength $4000\ \text{Å}$ What is the maximum kinetic energy of the emitted photoelectron?

(A) $7.61\ \text{eV}$
(B) $1.41\ \text{eV}$
(C) $3.3\ \text{eV}$
(D) No photoelectron would be emitted

Answer: (B) $1.41\ \text{eV}$ · Key from source paper

Q84 JEE Main 2021 · 27 Jul · Shift 2 Numerical

The K_α X-ray of molybdenum has wavelength $0.071\ \text{nm}$. If the energy of a molybdenum atom with a K electron knocked out is $27.5\ \text{keV}$, the energy of this atom when an L electron is knocked out will be _____ keV. (Round off to the nearest integer) $[h = 4.14 \times 10^{-15}\ \text{eV s},\ c = 3 \times 10^{8}\ \text{m s}^{-1}]$

Numerical value type: the answer is a number.

Answer: 10. · Key from source paper

Q85 JEE Main 2021 · 20 Jul · Shift 1 MCQ

A nucleus of mass M emits γ-ray photon of frequency ν. The loss of internal energy by the nucleus is: [Take c as the speed of electromagnetic wave]

(A) $h\nu$
(B) 0
(C) $h\nu\left[1 - \frac{h\nu}{2Mc^2}\right]$
(D) $h\nu\left[1 + \frac{h\nu}{2Mc^2}\right]$

Answer: (D) $h\nu\left[1 + \frac{h\nu}{2Mc^2}\right]$ · Key from source paper

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Q86 JEE Main 2021 · 20 Jul · Shift 2 MCQ

An electron having de-Broglie wavelength λ is incident on a target in a X-ray tube. Cut-off wavelength of emitted X-ray is:

(A) 0
(B) $\frac{2\,m^2c^2\lambda^2}{h^2}$
(C) $\frac{2mc\lambda^2}{h}$
(D) $\frac{hc}{mc}$

Answer: (C) $\frac{2mc\lambda^2}{h}$ · Key from source paper

Q87 JEE Main 2021 · 18 Mar · Shift 1 MCQ

Imagine that the electron in a hydrogen atom is replaced by a muon (μ). The mass of muon particle is 207 times that of an electron and charge is equal to the charge of an electron. The ionization potential of this hydrogen atom will be:-

(A) $13.6\ \text{eV}$
(B) $2815.2\ \text{eV}$
(C) $331.2\ \text{eV}$
(D) $27.2\ \text{eV}$

Answer: (B) $2815.2\ \text{eV}$ · Key from source paper

Q88 JEE Main 2021 · 17 Mar · Shift 1 MCQ

If an electron is moving in the nth orbit of the hydrogen atom, then its velocity (v_n) for the nth orbit is given as:

(A) $v_n \propto n$
(B) $v_n \propto \frac{1}{n}$
(C) $v_n \propto n^2$
(D) $v_n \propto \frac{1}{n^2}$

Answer: (B) $v_n \propto \frac{1}{n}$ · Key from source paper

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Q89 JEE Main 2021 · 17 Mar · Shift 1 MCQ

Which level of the single ionized carbon has the same energy as the ground state energy of hydrogen atom?

(A) 1
(B) 6
(C) 4
(D) 8

Answer: (B) 6 · Key from source paper

Q90 JEE Main 2021 · 17 Mar · Shift 2 MCQ

The atomic hydrogen emits a line spectrum consisting of various series. Which series of hydrogen atomic spectra is lying in the visible region?

(A) Brackett series
(B) Paschen series
(C) Lyman series
(D) Balmer series

Answer: (D) Balmer series · Key from source paper

Q91 JEE Main 2021 · 17 Mar · Shift 2 Numerical

A particle of mass m moves in a circular orbit in a central potential field $U(r) = U_0 r^4$. If Bohr's quantization conditions are applied, radii of possible orbitals r_n vary with $n^{\frac{1}{\alpha}}$, where α is _____.

Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q92 JEE Main 2021 · 16 Mar · Shift 1 Numerical

The first three spectral lines of H-atom in the Balmer series are given $\lambda_1, \lambda_2, \lambda_3$ considering the Bohr atomic model, the wave lengths of first and third spectral lines $\left(\frac{\lambda_1}{\lambda_3}\right)$ are related by a factor of approximately $x \times 10^{-1}$. The value of x, to the nearest integer, is _____.

Numerical value type: the answer is a number.

Answer: 15. · Key from source paper

Q93 JEE Main 2021 · 26 Feb · Shift 1 MCQ

If λ_1 and λ_2 are the wavelengths of the third member of Lyman and first member of the Paschen series respectively, then the value of $\lambda_1 : \lambda_2$ is :

(A) $7 : 135$
(B) $1 : 9$
(C) $1 : 3$
(D) $7 : 108$

Answer: (A) $7 : 135$ · Key from source paper

Q94 JEE Main 2021 · 26 Feb · Shift 2 MCQ

The recoil speed of a hydrogen atom after it emits a photon in going from $n = 5$ state to $n = 1$ state will be

(A) $4.17\ \mathrm{m\,s^{-1}}$
(B) $2.19\ \mathrm{m\,s^{-1}}$
(C) $4.34\ \mathrm{m\,s^{-1}}$
(D) $3.25\ \mathrm{m\,s^{-1}}$

Answer: (A) $4.17\ \mathrm{m\,s^{-1}}$ · Key from source paper

Q95 JEE Main 2021 · 25 Feb · Shift 2 MCQ

The wavelength of the photon emitted by a hydrogen atom when an electron makes a transition from $n = 2$ to $n = 1$ state is:

(A) $121.8\ \mathrm{nm}$
(B) $194.8\ \mathrm{nm}$
(C) $490.7\ \mathrm{nm}$
(D) $913.3\ \mathrm{nm}$

Answer: (A) $121.8\ \mathrm{nm}$ · Key from source paper

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Q96 JEE Main 2021 · 24 Feb · Shift 1 MCQ

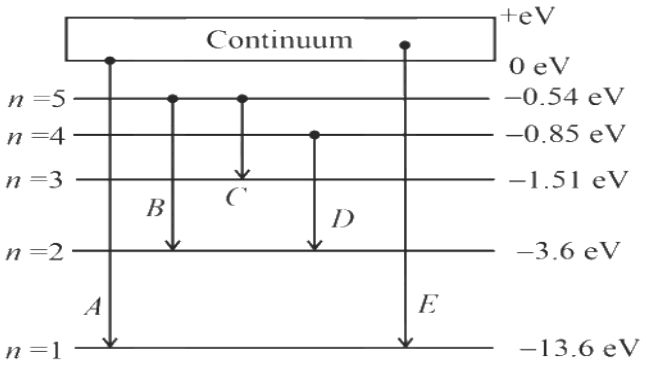
In the given figure, the energy levels of hydrogen atom have been shown along with some transitions marked A, B, C, D and E.

The transitions A, B and C respectively represent

(see the figure above)

Q19. In the given figure, the energy levels of hydrogen atom have been shown along with some transitions marked A, B, C, D and E.

The transitions A, B and C respectively represent



(1) The ionization potential of hydrogen, second member of Balmer series and third member of Paschen series.

(2) The series limit of Lyman series, second member of Balmer series and second member of Paschen series.

(3) The series limit of Lyman series, third member of Balmer series and second member of Paschen series.

(4) The first member of the Lyman series, third member of Balmer series and second member of Paschen series.

(A) The ionization potential of hydrogen, second member of Balmer series and third member of Paschen series.

(B) The series limit of Lyman series, second member of Balmer series and second member of Paschen series.

(C) The series limit of Lyman series, third member of Balmer series and second member of Paschen series.

(D) The first member of the Lyman series, third member of Balmer series and second member of Paschen series.

Answer: (C) The series limit of Lyman series, third member of Balmer series and second member of Paschen series. · Key from source paper

Q97 JEE Main 2021 · 24 Feb · Shift 2 MCQ

An X-ray tube is operated at 1.24 million volt. The shortest wavelength of the produced photon will be:

(A) 10^{-3} nm
(B) 10^{-2} nm
(C) 10^{-4} nm
(D) 10^{-1} nm

Answer: (A) 10^{-3} nm · Key from source paper

Q98 JEE Main 2021 · 24 Feb · Shift 2 MCQ

According to Bohr atom model, in which of the following transitions will the frequency be maximum?

(A) $n = 3$ to $n = 2$
(B) $n = 5$ to $n = 4$
(C) $n = 4$ to $n = 3$
(D) $n = 2$ to $n = 1$

Answer: (D) $n = 2$ to $n = 1$ · Key from source paper

Q99 JEE Main 2020 · 4 Sep · Shift 1 Numerical

In the line spectra of hydrogen atom, difference between the largest and the shortest wavelengths of the Lyman series is 305 Å. The corresponding difference for the Paschan series in Å is: _____

Numerical value type: the answer is a number.

Accepted answers: 10553.14 or 10588. · Key from source paper

Q100 JEE Main 2020 · 2 Sep · Shift 2 MCQ

In a hydrogen atom the electron makes a transition from $(n+1)^{\text{th}}$ level to the nth level. If $n >> 1$, the frequency of radiation emitted is proportional to :

(A) $\frac{1}{n}$
(B) $\frac{1}{n^3}$
(C) $\frac{1}{n^2}$
(D) $\frac{1}{n^4}$

Answer: (B) $\frac{1}{n^3}$ · Key from source paper

Q101 JEE Main 2020 · 9 Jan · Shift 2 MCQ

The energy required to ionise a hydrogen like ion in its ground state is 9 Rydbergs. What is the wavelength of the radiation emitted when the electron in this ion jumps from the second excited stale (sic) to the ground state?

(A) 2nm

(B) 11.4nm

(C) 35.8nm

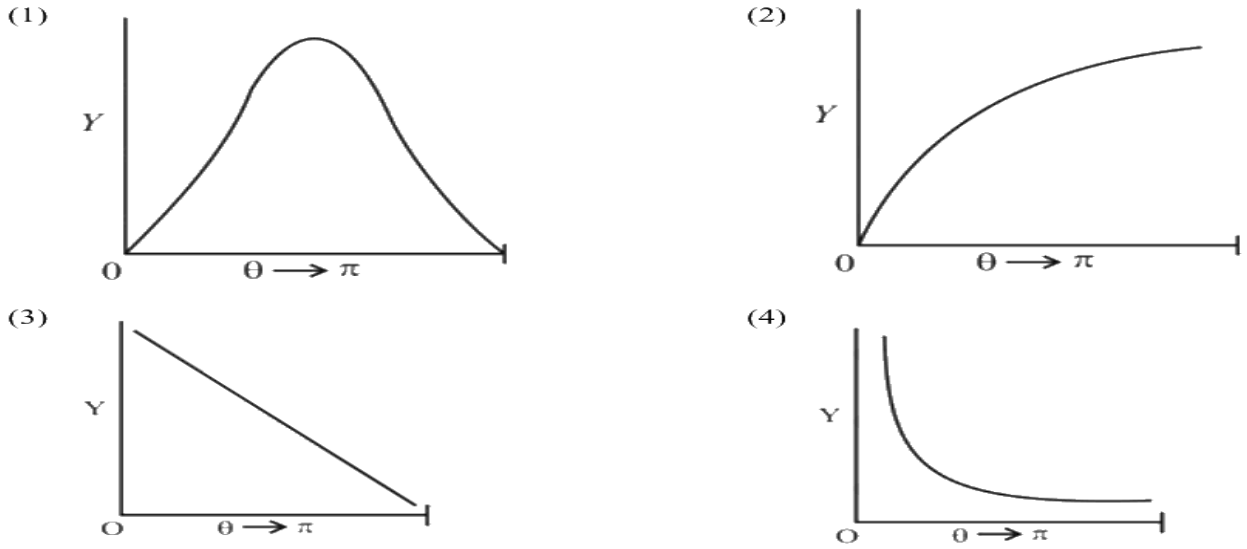
(D) 8.6nm

Answer: (B) 11.4nm · Key from source paper

Q102 JEE Main 2020 · 8 Jan · Shift 1 MCQ

The graph which depicts the results of Rutherford gold foil experiment with α -particles is:
θ : Scattering angle
Y : Number of scattered α -particles detected
(Plots are schematic and not to scale)

Q19. The graph which depicts the results of Rutherford gold foil experiment with α -particles is:
θ : Scattering angle
Y : Number of scattered α -particles detected
(Plots are schematic and not to scale)



(A) *see figure*

(B) *see figure*

(C) *see figure*

(D) *see figure*

Answer: (D) · Key from source paper

Q103 JEE Main 2020 · 8 Jan · Shift 2 Numerical

The first member of the Balmer series of hydrogen atom has a wavelength of 6561 Å. The wavelength of the second member of the Balmer series (in nm) is_____

Numerical value type: the answer is a number.

Answer: 486. · Key from source paper

Q104 JEE Main 2020 · 7 Jan · Shift 1 MCQ

The time period of revolution of electron in its ground state orbit in a hydrogen atom is 1.6×10^{-16}s. The frequency of revolution of the electron in its first excited state (in s^{-1}) is:

(A) 1.6×10^{14}
(B) 7.8×10^{14}
(C) 6.2×10^{15}
(D) 5.6×10^{12}

Answer: (B) 7.8×10^{14} · Key from source paper

Q105 JEE Main 2019 · 12 Apr · Shift 1 MCQ

An excited He^{+} ion emits two photons in succession, with wavelengths 108.5 nm and 30.4 nm in making a transition to the ground state. The quantum number n, corresponding to its initial excited state is (for a photon of wavelength λ, energy $E = \frac{1240\ eV}{\lambda(in\ nm)}$)

(A) n = 6
(B) n = 5
(C) n = 7
(D) n = 4

Answer: (B) n = 5 · Key from source paper

Q106 JEE Main 2019 · 12 Apr · Shift 2 MCQ

Consider an electron in a hydrogen atom, revolving in its second excited state (having radius 4.65 Å). The de-Broglie wavelength of this electron is:

(A) 12.9 Å
(B) 6.6 Å
(C) 9.7 Å
(D) 3.5 Å

Answer: (C) 9.7 Å · Key from source paper

Q107 JEE Main 2019 · 12 Apr · Shift 2 MCQ

The electron in a hydrogen atom first jumps from the third excited state to the second excited state and subsequently to the first excited state. The ratio of the respective wavelengths $\frac{\lambda_1}{\lambda_2}$ of the photons emitted in this process is:

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(A) $\frac{7}{5}$
(B) $\frac{20}{7}$
(C) $\frac{9}{7}$
(D) $\frac{27}{5}$

Answer: (B) $\frac{20}{7}$ · Key from source paper

Q108 JEE Main 2019 · 10 Apr · Shift 2 MCQ

In Li^{++} ,electron in first Bohr orbit is excited to a level by a radiation of wavelength λ.When the ion gets de excited to the ground state in all possible ways (including intermediate emissions), a total of six spectral lines are observed. What is the value of λ ?
(Given: $h = 6.63 \times 10^{-34}\ \mathrm{J\,s}$; $c = 3 \times 10^{8}\ \mathrm{m\ s^{-1}}$)

(A) $10.8\ \mathrm{nm}$
(B) $9.4\ \mathrm{nm}$
(C) $11.4\ \mathrm{nm}$
(D) $12.3\ \mathrm{nm}$

Answer: (A) $10.8\ \mathrm{nm}$ · Key from source paper

Q109 JEE Main 2019 · 9 Apr · Shift 1 MCQ

Taking the wavelength of first Balmer line in hydrogen spectrum (n = 3 to n = 2) as 660 nm , the wavelength of the 2nd Balmer line (n = 4 to n = 2) will be :

(A) 889.2 nm
(B) 488.9 nm
(C) 388.9 nm
(D) 642.7 nm

Answer: (B) 488.9 nm · Key from source paper

Q110 JEE Main 2019 · 9 Apr · Shift 2 MCQ

A He^{+} ion is in its first excited state. Its ionization energy is:

(A) 13.60 eV
(B) 48.36 eV
(C) 54.40 eV
(D) 6.04 eV

Answer: (A) 13.60 eV · Key from source paper

Q111 JEE Main 2019 · 8 Apr · Shift 1 MCQ

Radiation coming from transitions $n = 2$ to $n = 1$ of hydrogen atoms fall on He^{+} ions in $n = 1$ and $n = 2$ states. The possible transition of helium ions as they absorb energy from the radiation is:

(A) $n = 2 \rightarrow n = 3$
(B) $n = 2 \rightarrow n = 4$
(C) $n = 2 \rightarrow n = 5$
(D) $n = 1 \rightarrow n = 4$

Answer: (B) $n = 2 \rightarrow n = 4$ · Key from source paper

Q112 JEE Main 2019 · 12 Jan · Shift 1 MCQ

A particle of mass m moves in a circular orbit in a central potential field $U(r) = \frac{1}{2}kr^2$. If Bohr's quantization conditions are applied, radii of possible orbitals and energy levels vary with quantum number n as:

(A) $r_n \propto n^2,\ E_n \propto \frac{1}{n^2}$
(B) $r_n \propto \sqrt{n},\ E_n \propto n$
(C) $r_n \propto n,\ E_n \propto n$
(D) $r_n \propto \sqrt{n},\ E_n \propto \frac{1}{n}$

Answer: (B) $r_n \propto \sqrt{n},\ E_n \propto n$ · Key from source paper

Q113 JEE Main 2019 · 12 Jan · Shift 2 MCQ

In a Frank - Hertz experiment, an electron of energy $5.6\ eV$ passes through mercury vapour and emerges with an energy $0.7\ eV$. The minimum wavelength of photons emitted by mercury atoms is close to:

(A) $250\ nm$
(B) $1700nm$
(C) $220nm$
(D) $2020nm$

Answer: (A) $250\ nm$ · Key from source paper

Q114 JEE Main 2019 · 11 Jan · Shift 1 MCQ

A hydrogen atom, initially in the ground state is excited by absorbing a photon of wavelength $980A$ .... The radius of the atom in the excited state, in terms of Bohr radius a_0, will be:

(A) $25a_0$
(B) $9a_0$
(C) $16a_0$
(D) None of the above

Answer: (C) $16a_0$ · Key from source paper

Q115 JEE Main 2019 · 11 Jan · Shift 2 MCQ

In a hydrogen like atom, when an electron jumps from the M-shell to the L-shell, the wavelength of emitted radiation is L. If an electron jumps from N -shell to the L -shell, the wavelength of emitted radiation will be:

(A) $\frac{27}{20}\lambda$
(B) $\frac{16}{25}\lambda$
(C) $\frac{25}{16}\lambda$
(D) $\frac{20}{27}\lambda$

Answer: (D) $\frac{20}{27}\lambda$ · Key from source paper

Q116 JEE Main 2018 · 16 Apr · Online MCQ

The de-Broglie wavelength (λ_B) associated with the electron orbiting in the second excited state of hydrogen atom is related to that in the ground state (λ_G) by:

(A) $\lambda_B = 3\lambda_G$
(B) $\lambda_B = 2\lambda_G$
(C) $\lambda_B = \lambda_{\frac{G}{3}}$
(D) $\lambda_B = \lambda_{\frac{G}{2}}$

Answer: (A) $\lambda_B = 3\lambda_G$ · Key from source paper

Q117 JEE Main 2018 · 15 Apr · Shift 1 MCQ

The energy required to remove the electron from a singly ionized Helium atom is 2.2 times the energy required to remove an electron from Helium atom. The total energy required to ionize the Helium atom completely is:

(A) $20\mathrm{eV}$
(B) $79\mathrm{eV}$
(C) $109\mathrm{eV}$
(D) $34\mathrm{eV}$

Answer: (B) $79\mathrm{eV}$ · Key from source paper

Q118 JEE Main 2018 · 15 Apr · Shift 2 MCQ

Muon (μ^{-1}) is negatively charged ($|\mathrm{q}| = |\mathrm{e}|$) with a mass $\mathrm{m}_\mu = 200\ \mathrm{m}_\mathrm{e}$, where m_e is the mass of the electron and e is the electronic charge. If μ^{-1} is bound to a proton to form a hydrogen like atom, identify the correct statements (A) Radius of the muonic orbit is 200 times smaller than that of the electron (B) the speed of the μ^{-1} in the nth orbit is $\frac{1}{200}$ times that of the election in the nth orbit (C) The Ionization energy of muonic atom is 200 times more than that of an hydrogen atom (D) The momentum of the muon in the nth orbit is 200 times more than that of the electron

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(A) (A), (B), (D)
(B) (B), (D)
(C) (C),(D)
(D) (A), (C), (D)

Answer: (D) (A), (C), (D) · Key from source paper

Q119 JEE Main 2018 · 8 Apr · Offline MCQ

An electron from various excited states of hydrogen atom emit radiation to come to the ground state. Let λ_n, λ_g be the de Broglie wavelength of the electron in the nth state and the ground state respectively. Let Λ_n be the wavelength of the emitted photon in the transition from the nth state to the ground state. For large n, (A, B are constants)

(A) $\Lambda_n^2 \approx \lambda$
(B) $\Lambda_n \approx A + \frac{B}{\lambda_n^2}$
(C) $\Lambda_n \approx A + B\lambda_n$
(D) $\Lambda_n^2 \approx A + B\lambda_n^2$

Answer: (B) $\Lambda_n \approx A + \frac{B}{\lambda_n^2}$ · Key from source paper

Q120 JEE Main 2018 · 8 Apr · Offline MCQ

If the series limit frequency of the Lyman series is V_L, then the series limit frequency of the Pfund series is:

(A) $\frac{V_L}{25}$
(B) $25\ V_L$
(C) $16\ V_L$
(D) $\frac{V_L}{16}$

Answer: (A) $\frac{V_L}{25}$ · Key from source paper

Q121 JEE Main 2017 · 9 Apr · Online MCQ

The acceleration of an electron in the first orbit of the hydrogen atom ($n = 1$) is :

(A) $\frac{h^2}{4\pi m^2 r^3}$
(B) $\frac{h^2}{\pi^2 m^2 r^3}$
(C) $\frac{h^2}{8\pi^2 m^2 r^3}$
(D) $\frac{h^2}{4\pi^2 m^2 r^3}$

Answer: (D) $\frac{h^2}{4\pi^2 m^2 r^3}$ · Key from source paper

Q122 JEE Main 2017 · 8 Apr · Online MCQ

According to Bohr's theory, the time averaged magnetic field at the centre (i.e., nucleus) of a hydrogen atom due to the motion of electrons in the nth orbit is proportional to: (n = principal quantum number)

(A) n^{-3}

(B) n^{-2}

(C) n^{-4}

(D) n^{-5}

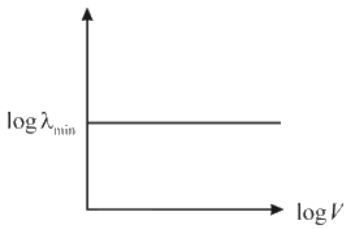
Answer: (D) n^{-5} · Key from source paper

Q123 JEE Main 2017 · 2 Apr · Offline MCQ

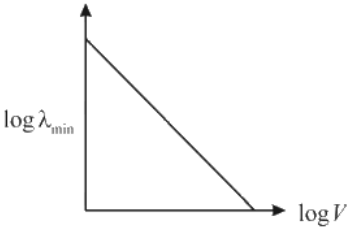
An electron beam is accelerated by a potential difference V to hit a metallic target to produce X - rays. It produces continuous as well as characteristic X - rays. If λ_{min} is the smallest possible wavelength of X - ray in the spectrum, the variation of $\log \lambda_{min}$ with $\log V$ is correctly represented in :

Q23. An electron beam is accelerated by a potential difference V to hit a metallic target to produce X - rays. It produces continuous as well as characteristic X - rays. If λ_{min} is the smallest possible wavelength of X - ray in the spectrum, the variation of $\log\lambda_{min}$ with $\log V$ is correctly represented in :

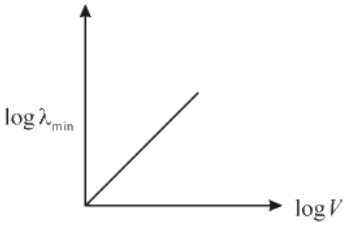
(1)



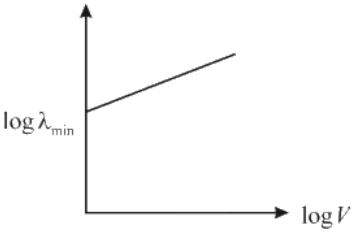
(2)



(3)



(4)



(A) *see figure*

(B) *see figure*

(C) *see figure*

(D) *see figure*

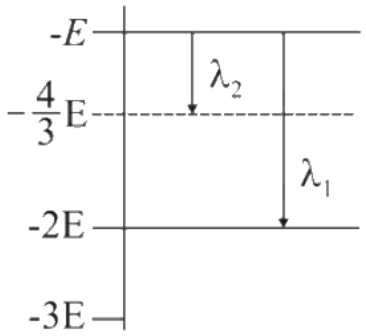
Answer: (B) · Key from source paper

Q124 JEE Main 2017 · 2 Apr · Offline MCQ

Some energy levels of a molecule are shown in the figure. The ratio of the wavelengths $r = \frac{\lambda_1}{\lambda_2}$, is given by:

(see the figure above)

Q27. Some energy levels of a molecule are shown in the figure. The ratio of the wavelengths $r = \frac{\lambda_1}{\lambda_2}$, is given by:



(1) $r = \frac{1}{3}$
(2) $r = \frac{4}{3}$
(3) $r = \frac{2}{3}$
(4) $r = \frac{3}{4}$

(A) $r = \frac{1}{3}$
(B) $r = \frac{4}{3}$
(C) $r = \frac{2}{3}$
(D) $r = \frac{3}{4}$

Answer: (A) $r = \frac{1}{3}$ · Key from source paper

Q125 JEE Main 2016 · 10 Apr · Online MCQ

A neutron moving with a speed 'v' makes a head on collision with a stationary hydrogen atom in ground state. The minimum kinetic energy of the neutron for which perfectly inelastic collision will take place is :

(A) 20.4 eV
(B) 10.2 eV
(C) 12.1 eV
(D) 16.8 eV

Answer: (A) 20.4 eV · Key from source paper

Q126 JEE Main 2016 · 9 Apr · Online MCQ

An electron in a hydrogen atom makes a transition from $n = 2$ to $n = 1$ and emits a photon. This photon strikes a doubly ionized lithium atom which was already in an excited state and completely removes the orbiting electron. The least quantum number for the excited state of the lithium-ion for the process is

(A) 2
(B) 4
(C) 5
(D) 3

Answer: (B) 4 · Key from source paper

Q127 JEE Main 2015 · 11 Apr · Online MCQ

The de-Broglie wavelength associated with the electron in the $n = 4$ level is:

(A) Half of the de-Broglie wavelength of the electron in the ground state
(B) Four times the de-Broglie wavelength of the electron in the ground state
(C) $\frac{1}{4}$th of the de-Broglie wavelength of the electron in the ground state
(D) Two times the de-Broglie wavelength of the electron in the ground state

Answer: (B) Four times the de-Broglie wavelength of the electron in the ground state · Key from source paper

Q128 JEE Main 2015 · 10 Apr · Online MCQ

If one were to apply the Bohr model to a particle of mass 'm' and charge 'q' moving in a plane under the influence of a magnetic field 'B', the energy of the charged particle in the nth level will be:

(A) $n\left(\frac{hqB}{\pi m}\right)$
(B) $n\left(\frac{hqB}{4\pi m}\right)$
(C) $n\left(\frac{hqB}{2\pi m}\right)$
(D) $n\left(\frac{hqB}{8\pi m}\right)$

Answer: (B) $n\left(\frac{hqB}{4\pi m}\right)$ · Key from source paper

Q129 JEE Main 2015 · 4 Apr · Offline MCQ

As an electron makes a transition from an excited state to the ground state of a hydrogen-like atom/ion

(A) kinetic energy and total energy decrease but potential energy increases
(B) its kinetic energy increases but potential energy and total energy decrease
(C) kinetic energy, potential energy and total energy decrease
(D) kinetic energy decreases, potential energy increases but total energy remains same

Answer: (B) its kinetic energy increases but potential energy and total energy decrease · Key from source paper

Q130 JEE Main 2014 · 9 Apr · Online MCQ

If the binding energy of the electron in a hydrogen atom is 13.6 eV, the energy required to remove the electron from the first excited state of Li^{++} is :

(A) 13.6 eV
(B) 3.4 eV
(C) 122.4 eV
(D) 30.6 eV

Answer: (D) 30.6 eV · Key from source paper

Q131 JEE Main 2014 · 6 Apr · Offline MCQ

Hydrogen $({}_1H^1)$, Deuterium $({}_1H^2)$, singly ionised Helium $({}_2He^4)^+$ and doubly ionised lithium $({}_3Li^6)^{++}$ all have one electron around the nucleus. Consider an electron transition from $n = 2$ to $n = 1$. If the wave lengths of emitted radiation are λ_1, λ_2, λ_3 and λ_4 respectively then approximately which one of the following is correct ?

(A) $4\lambda_1 = 2\lambda_2 = 2\lambda_3 = \lambda_4$
(B) $\lambda_1 = 2\lambda_2 = 2\lambda_3 = \lambda_4$
(C) $\lambda_1 = \lambda_2 = 4\lambda_3 = 9\lambda_4$
(D) $\lambda_1 = 2\lambda_2 = 3\lambda_3 = 4\lambda_4$

Answer: (C) $\lambda_1 = \lambda_2 = 4\lambda_3 = 9\lambda_4$ · Key from source paper

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Q132 JEE Main 2013 · 25 Apr · Online MCQ

A 12.5eV electron beam is used to bombard gaseous hydrogen at room temperature. It will emit:

(A) 2 lines in the Lyman series and 1 line in the Balmar series
(B) 3 lines in the Lyman series
(C) 1 line in the Lyman series and 2 lines in the Balmar series
(D) 3 lines in the Balmer series

Answer: (A) 2 lines in the Lyman series and 1 line in the Balmar series · Key from source paper

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Q133 JEE Main 2013 · 23 Apr · Online MCQ

In the Bohr's model of hydrogen-like atom the force between the nucleus and the electron is modified as $F = \frac{e^2}{4\pi\varepsilon_0}\left(\frac{1}{r^2} + \frac{\beta}{r^3}\right)$, where β is a constant. For this atom, the radius of the nth orbit in terms of the Bohr radius $\left(a_0 = \frac{\varepsilon_0 h^2}{m\pi e^2}\right)$ is :

(A) $r_n = a_0 n - \beta$
(B) $r_n = a_0 n^2 + \beta$
(C) $r_n = a_0 n^2 - \beta$
(D) $r_n = a_0 n + \beta$

Answer: (C) $r_n = a_0 n^2 - \beta$ · Key from source paper

Q134 JEE Main 2013 · 7 Apr · Offline MCQ

In a hydrogen like atom electron makes transition from an energy level with quantum number n to another with quantum number (n − 1). If n >> 1, the frequency of radiation emitted is proportional to :

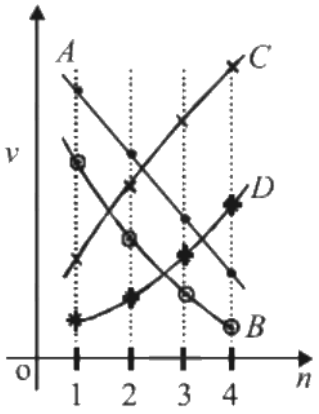
(A) $\frac{1}{n^{3/2}}$
(B) $\frac{1}{n^3}$
(C) $\frac{1}{n}$
(D) $\frac{1}{n^2}$

Answer: (B) $\frac{1}{n^3}$ · Key from source paper

Q135 AIEEE 2012 · 26 May · Online MCQ

Which of the plots shown in the figure represents speed (v) of the electron in a hydrogen atom as a function of the principal quantum number (n) ?
(see the figure above)

Q28. Which of the plots shown in the figure represents speed (v) of the electron in a hydrogen atom as a function of the principal quantum number (n) ?



(1) B (2) D
(3) C (4) A

(A) B
(B) D
(C) C
(D) A

Answer: (A) B · Key from source paper

Q136 AIEEE 2012 · 19 May · Online MCQ

Ionisation energy of Li (Lithium) atom in ground state is 5.4eV. Binding energy of an electron in Li^+ ion in ground state is 75.6eV. Energy required to remove all three electrons of Lithium (Li) atom is

(A) 81.0eV
(B) 135.4eV
(C) 203.4eV
(D) 156.6eV

Answer: (C) 203.4eV · Checked by our team

Q137 AIEEE 2012 · 12 May · Online MCQ

A hypothetical atom has only three energy levels. The ground level has energy, $E_1 = -8\,\text{eV}$. The two excited states have energies, $E_2 = -6\,\text{eV}$ and $E_3 = -2\,\text{eV}$. Then which of the following wavelengths will not be present in the emission spectrum of this atom?

(A) 207 nm
(B) 465 nm
(C) 310 nm
(D) 620 nm

Answer: (B) 465 nm · Key from source paper

Q138 AIEEE 2012 · 12 May · Online MCQ

A doubly ionised Li atom is excited from its ground state($n = 1$) to $n = 3$ state. The wavelengths of the spectral lines are given by λ_{32}, λ_{31} and λ_{21}. The ratio $\lambda_{32}/\lambda_{31}$ and $\lambda_{21}/\lambda_{31}$ are, respectively

(A) $8.1, 0.67$
(B) $8.1, 1.2$
(C) $6.4, 1.2$
(D) $6.4, 0.67$

Answer: (C) $6.4, 1.2$ · Key from source paper

Q139 AIEEE 2012 · 7 May · Online MCQ

The electron of a hydrogen atom makes a transition from the $(n+1)^{\text{th}}$ orbit to the nth orbit. For large n the wavelength of the emitted radiation is proportional to

(A) n
(B) n^3
(C) n^4
(D) n^2

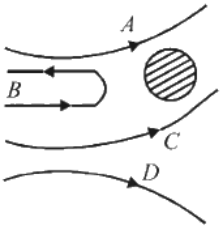
Answer: (B) n^3 · Key from source paper

Q140 AIEEE 2012 · 7 May · Online MCQ

In the Rutherford experiment, α-particles are scattered from a nucleus as shown. Out of the four paths, which path is not possible?

(see the figure above)

Q27. In the Rutherford experiment, α-particles are scattered from a nucleus as shown. Out of the four paths, which



path is not possible?

(1) D (2) B

(3) C (4) A

(A) D

(B) B

(C) C

(D) A

Answer: (C) C · Key from source paper

Q141 AIEEE 2012 · Offline MCQ

Hydrogen atom is excited from ground state to another state with principal quantum number equal to 4. Then the number of spectral lines in the emission spectra will be

(A) 2

(B) 3

(C) 5

(D) 6

Answer: (D) 6 · Key from source paper

Q142 AIEEE 2012 · Offline MCQ

A diatomic molecule is made of two masses m_1 and m_2 which are separated by a distance r. If we calculate its rotational energy by applying Bohr's rule of angular momentum quantization, its energy will be given by (n is an integer)

(A) $\frac{(m_1+m_2)^2 n^2 h^2}{2m_1^2 m_2^2 r^2}$

(B) $\frac{n^2 h^2}{2(m_1+m_2)r^2}$

(C) $\frac{2n^2 h^2}{(m_1+m_2)r^2}$

(D) $\frac{(m_1+m_2)n^2 h^2}{2m_1 m_2 r^2}$

Answer: (D) $\frac{(m_1+m_2)n^2 h^2}{2m_1 m_2 r^2}$ · Key from source paper

Q143 AIEEE 2011 MCQ

Energy required for the electron excitation in Li^{++} from the first to the third Bohr orbit is :

(A) 36.3eV
(B) 108.8eV
(C) 122.4eV
(D) 12.1eV

Answer: (B) 108.8eV · Key from source paper

Q144 AIEEE 2009 MCQ

The transition from the state $n = 4$ to $n = 3$ in a hydrogen like atom results in ultraviolet radiation. Infrared radiation will be obtained in the transition from

(A) $2 \rightarrow 1$
(B) $3 \rightarrow 2$
(C) $4 \rightarrow 2$
(D) $5 \rightarrow 4$

Answer: (D) $5 \rightarrow 4$ · Key from source paper

Q145 AIEEE 2008 MCQ

Suppose an electron is attracted towards the origin by a force k/r where ' k ' is a constant and ' r ' is the distance of the electron from the origin. By applying Bohr model to this system, the radius of the nth orbital of the electron is found to be ' r_n ' and the kinetic energy of the electron to be T_n. Then which of the following is true?

(A) $T_n \propto 1/n^2, \quad r_n \propto n^2$
(B) T_n independent of n, $r_n \propto n$
(C) $T_n \propto 1/n, \quad r_n \propto n$
(D) $T_n \propto 1/n, \quad r_n \propto n^2$

Answer: (B) T_n independent of n, $r_n \propto n$ · Key from source paper

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Q146 AIEEE 2007 MCQ

Which of the following transitions in hydrogen atoms emit photons of highest frequency?

(A) n = 2 to n = 6
(B) n = 6 to n = 2
(C) n = 2 to n = 1
(D) n = 1 to n = 2

Answer: (C) n = 2 to n = 1 · Key from source paper

Q147 AIEEE 2006 MCQ

An alpha nucleus of energy $\frac{1}{2}mv^2$ bombards a heavy nuclear target of charge Ze. Then the distance of closest approach for the alpha nucleus will be proportional to

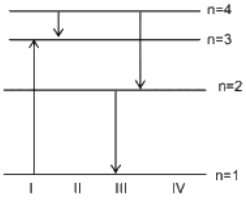
(A) $\frac{1}{Ze}$
(B) v^2
(C) $\frac{1}{m}$
(D) $\frac{1}{v^4}$

Answer: (C) $\frac{1}{m}$ · Key from source paper

Q148 AIEEE 2005 MCQ

The diagram shows the energy levels for an electron in a certain atom. Which transition shown represents the emission of a photon with the most energy ?
(see the figure above)

Q71. The diagram shows the energy levels for an electron in a certain atom. Which transition shown represents the emission of a photon with the most energy ?



(1) III (2) IV
(3) I (4) II

(A) III
(B) IV
(C) I
(D) II

Answer: (A) III · Key from source paper

Q149 AIEEE 2004 MCQ

An α-particle of energy 5MeV is scattered through 180° by a fixed uranium nucleus. The distance of the closest approach is of the order of

(A) 1Å
(B) 10^{-10} cm
(C) 10^{-12} cm
(D) 10^{-15} cm

Answer: (C) 10^{-12} cm · Key from source paper

Q150 AIEEE 2003 MCQ

Which of the following atoms has the lowest ionization potential?

(A) $^{14}_{7}\mathrm{N}$
(B) $^{133}_{55}\mathrm{Cs}$
(C) $^{40}_{18}\mathrm{Ar}$
(D) $^{16}_{8}\mathrm{O}$

Answer: (B) $^{133}_{55}\mathrm{Cs}$ · Key from source paper

Q151 AIEEE 2003 MCQ

The wavelengths involved in the spectrum of deuterium $\left(^{2}_{1}\mathrm{D}\right)$ are slightly different from that of hydrogen spectrum, because

(A) the size of the two nuclei are different
(B) the nuclear forces are different in the two cases
(C) the masses of the two nuclei are different
(D) the attraction between the electron and the nucleus is different in the two cases

Answer: (C) the masses of the two nuclei are different · Key from source paper

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Q152 AIEEE 2003 MCQ

If the binding energy of the electron in a hydrogen atom is 13.6eV, the energy required to remove the electron from the first excited state of Li^{++} is

(A) 30.6eV
(B) 13.6eV
(C) 3.4eV
(D) 122.4eV

Answer: (A) 30.6eV · Checked by our team

Q153 AIEEE 2002 MCQ

If 13.6eV energy is required to ionize the hydrogen atom, then the energy required to remove an electron from $n = 2$ is

(A) 10.2eV
(B) 0eV
(C) 3.4eV
(D) 6.8eV

Answer: (C) 3.4eV · Key from source paper

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