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EdLoop EAPCET

CHEMISTRY · EAPCET (EAMCET)

Atomic Structure

Previous Year Questions with answers

325 questions · **148** papers · **2010–2026** · newest paper first

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What is in this PDF: every Atomic Structure question we hold from past AP and TS EAPCET (called EAMCET until 2020 in Andhra Pradesh and 2023 in Telangana) 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

5.2%
of Chemistry questions, 2022–2026

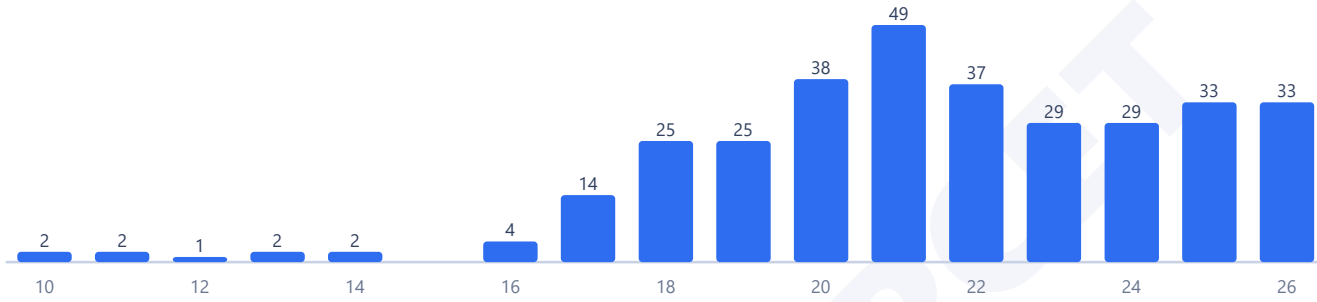
325
questions, 2010–2026

77 of 77
papers asked it, 2022–2026

325 / 0
MCQ / numerical, 2010–2026

Trend. Steady: 2.1 questions per paper in 2024–2026 against 2.1 in 2022–2023.

Questions per year



Counts are the questions we hold: 325 in 148 papers. No question in this chapter was found repeated across papers.

Most-asked topics in this chapter (2010–2026)

Quantum Mechanical Model	113
Bohr Model & Hydrogen Spectrum	94
Electromagnetic Radiation & Quantum Theory	52
Electronic Configuration	41
Early Models & Subatomic Particles	25

How often it comes up

Atomic Structure is one of the heaviest chapters in Class 11 physical chemistry for both Telugu states. Within the papers we hold for AP and TS EAPCET between 2022 and 2026, this unit brought 161 questions across 77 papers. That yields an average rate of 2.1 questions per paper, claiming 5.2% of all chemistry questions in that recent window. Taking into account the complete historical archive from 2010 to 2026, Atomic Structure generated 325 questions across 149 papers, maintaining an average of 2.2 questions per paper and a 5.5% subject share. For early years between 2010 and 2021, our records capture 164 questions across 72 papers (5.7% share). Across the recent three-year window from 2024 to 2026, it brought 95 questions across 46 sittings, representing a 5.2% share. Comparing the last three years to early papers, the chapter's share of the subject is down, while compared to the recent five-year window it is about the same.

State-level distributions indicate identical frequency across regional examinations. AP EAPCET papers between 2022 and 2026 contributed 101 questions across 48 papers in our set (2.1 per paper, 5.3% share). Over the same window, TS EAPCET provided 60 questions across 29 papers in our set (2.1 per paper, 5.2% share). With 77 out of 77 recent papers containing questions, this topic appeared without omission in every sitting since 2022 across both states. The chapter ranks 5th of 31 chemistry chapters by question share between 2022 and 2026. Sittings in 2021 were the busiest in our archive, delivering 49 questions across 17 papers.

Most-asked topics

Questions distribute across five syllabus areas:

- **Bohr Model & Hydrogen Spectrum**: This primary topic brought 54 questions between 2022 and 2026, contributing to 94 questions across all years in our archive. It tests the Rydberg formula, line series limits, orbital radii, ionization potentials, and orbital velocity ratios.
- **Quantum Mechanical Model**: Close behind, this section produced 52 questions in the recent five-year span and 113 questions overall. Key concepts cover quantum numbers (n, l, m, s), orbital shapes, radial and angular nodes, de Broglie's hypothesis, and Heisenberg's uncertainty principle.
- **Electromagnetic Radiation & Quantum Theory**: This section contributed 29 questions over the recent five years, out of 52 questions across our entire archive. Topics evaluate Planck's quantum theory E = h ν, the photoelectric equation, and wave-particle duality.
- **Electronic Configuration**: A block of 21 questions appeared in the recent five-year window, out of 41 questions across the entire archive. Questions examine Aufbau principle, Pauli exclusion principle, Hund's rule of maximum multiplicity, and anomalous configurations of chromium and copper.
- **Early Models & Subatomic Particles**: A smaller pool of 5 questions appeared recently, out of 25 questions in the complete record. It covers cathode rays, discovery of fundamental subatomic particles, and Rutherford's nuclear model.

What the questions look like

Rydberg equation calculations and hydrogen emission line ratios are constantly asked. A standard problem compares the wavelength of a transition from the fourth energy level down to the ground state with a transition from the fourth level to the second level, requiring students to compute ratios of inverse square differences. Other questions ask for the maximum number of spectral lines emitted when an excited hydrogen sample cascades from principal quantum number n down to the ground state.

Quantum numbers and nodal geometry form the other major question block. Examiners ask students to calculate the number of radial nodes (n - l - 1) and angular nodes (l) for specific subshells, or to identify valid sets of the four quantum numbers for a specific valence electron. Electronic configuration questions frequently ask for the ratio of s-electrons to p-electrons in elements from sodium to argon, or the number of unpaired electrons in divalent and trivalent transition metal cations.

How to practise it

Start by mastering Bohr's model of one-electron species: radius is r_n = zero point five two nine n^2 / Z angstroms, velocity is v_n = two point one eight × ten to the sixth power Z / n metres per second, and energy is E_n = - thirteen point six Z^2 / n^2 eV. Wave number of emitted radiation during transition from initial orbit n_two to final orbit n_one is $1/\lambda = R_H Z^2 [1/n_{one}^2 - 1/n_{two}^2]$, where Rydberg constant R_H is approximately one point zero nine seven × ten to the seventh power per metre.

Next, study quantum mechanics and nodal formulas. Total number of nodes in any atomic orbital is n - 1. This splits into radial nodes = n - l - 1 and planar or angular nodes = l. Orbital angular momentum of an electron depends solely on azimuthal quantum number l: $L = \sqrt{l(l+1)}\, h / (\text{two } \pi)$. Magnetic spin angular momentum is $S = \sqrt{s(s+1)}\, h / (\text{two } \pi)$, and spin-only magnetic moment for n unpaired electrons is $\mu = \sqrt{n(n + \text{two})}$ Bohr magnetons.

Finally, review Heisenberg's uncertainty principle $\Delta x \times \Delta p \geq h / (\text{four } \pi)$ and de Broglie's equation $\lambda = h / (m v)$. Remember that macroscopic bodies exhibit negligibly small de Broglie wavelengths due to their large masses, while subatomic particles like electrons exhibit pronounced wave characteristics.

Q1 AP EAPCET 2026 · 18 May · Shift 1 MCQ

Threshold frequencies of the metals A, B respectively are $4 \times 10^{14}\ Hz$ and $6 \times 10^{14}\ Hz$. If both are irradiated with light of frequency $10^{15}\ Hz$, what is the ratio of the kinetic energy of electrons emitted from A and B?

(A) $2 : 3$
(B) $3 : 2$
(C) $4 : 9$
(D) $9 : 4$

Answer: (B) $3 : 2$ · The council's preliminary key

Q2 AP EAPCET 2026 · 18 May · Shift 1 MCQ

The number of radial nodes possible for $3p$ orbital is x and number of angular nodes possible for $4d$-orbital is y. What is $x : y$?

(A) $3 : 2$
(B) $2 : 1$
(C) $1 : 2$
(D) $1 : 1$

Answer: (C) $1 : 2$ · The council's preliminary key

Q3 AP EAPCET 2026 · 18 May · Shift 2 MCQ

Wavelength of a particular line in Balmer series of atomic spectrum of hydrogen is 656.4 nm. What is the wavelength (in nm) of corresponding line in the spectrum of He^{+}?

(A) 328.2
(B) 164.1
(C) 492.3
(D) 246.1

Answer: (B) 164.1 · The council's preliminary key

Q4 AP EAPCET 2026 · 18 May · Shift 2 MCQ

In an atom, electron is moving with a speed of $x\ ms^{-1}$. If its speed is measured within an accuracy of 0.001%, what is its uncertainty in position (in m)?

($m_e = 9 \times 10^{-31}\ kg,\ h = 6.6 \times 10^{-34}\ Js$)

(A) $\frac{3\pi x}{55}$
(B) $\frac{55\pi}{3x}$
(C) $\frac{55}{3\pi x}$
(D) $\frac{55x}{3\pi}$

Answer: (C) $\frac{55}{3\pi x}$ · The council's preliminary key

Q5 AP EAPCET 2026 · 15 May · Shift 1 MCQ

The threshold frequency of a metal is 1.15×10^{15} Hz. If electrons with kinetic energy of 0.20 eV are ejected when this metal surface is irradiated with photons of frequency 'ν', the value of ν is ($h = 6.60 \times 10^{-34}$ Js, 1 eV $= 1.6 \times 10^{-19}$ J)

(A) 1.20×10^{14} Hz
(B) 1.20×10^{15} Hz
(C) 1.98×10^{14} Hz
(D) 1.98×10^{15} Hz

Answer: (B) 1.20×10^{15} Hz · The council's preliminary key

Q6 AP EAPCET 2026 · 15 May · Shift 1 MCQ

If the energy required to remove an electron from the ground state of He^+ is x J, the energy (in J) required to remove an electron from the ground state of Li^{2+} is

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

Answer: (C) $\frac{9}{4}x$ · The council's preliminary key

Q7 AP EAPCET 2026 · 15 May · Shift 2 MCQ

The wavelength of spectral line (X) of hydrogen spectrum is same as that of spectral line of He^+ spectrum corresponding to $n = 4 \rightarrow n = 2$ electron transition. The correct electron transition corresponding to X is

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

Answer: (A) $n = 2 \rightarrow n = 1$ · The council's preliminary key

Q8 AP EAPCET 2026 · 15 May · Shift 2 MCQ

The radius of first Bohr orbit of hydrogen is $a_0\ nm$. What is the de Broglie wavelength (in nm) associated with electron present in fourth orbit of hydrogen?

(A) $2\pi a_0$
(B) $\frac{2\pi a_0}{3}$
(C) $8\pi a_0$
(D) $4\pi a_0$

Answer: (C) $8\pi a_0$ · The council's preliminary key

Q9 AP EAPCET 2026 · 14 May · Shift 1 MCQ

A ball has a mass of 50g and a speed of 50 m/s. If the speed is measured within an accuracy of 2%, the uncertainty in its position (in m) is
(h $= 6.626 \times 10^{-34}$ J s, π=3.14)

(A) 2.12×10^{-34}
(B) 1.06×10^{-33}
(C) 2.12×10^{-33}
(D) 1.06×10^{-34}

Answer: (B) 1.06×10^{-33} · The council's preliminary key

Q10 AP EAPCET 2026 · 14 May · Shift 1 MCQ

The work function of Mg, Cu, Ag, Li are 3.7, 4.8, 4.3, 2.5 eV respectively. A wavelength of 300 nm light is shined on them. The metals which undergo photoelectric effect are

(A) Mg, Cu
(B) Cu, Ag
(C) Ag, Li
(D) Mg, Li

Answer: (D) Mg, Li · The council's preliminary key

Q11 AP EAPCET 2026 · 14 May · Shift 2 MCQ

In a photoelectric effect, the kinetic energy of electrons is 1.3×10^{-19} J. If work function of the metal is 2.27 eV, then the frequency (in Hz) of the incident radiation is
($h = 6.6 \times 10^{-34}$ Js, $1\,\text{eV} = 1.6 \times 10^{-19}$ J)

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(A) 7.47×10^{15}
(B) 7.47×10^{14}
(C) 6.47×10^{15}
(D) 3.47×10^{14}

Answer: (B) 7.47×10^{14} · The council's preliminary key

Q12 AP EAPCET 2026 · 14 May · Shift 2 MCQ

Consider the following two statements

Statement – I: The order of energies of 2s – orbitals of H, Li and Na is

$$E_{2s}(H) < E_{2s}(Li) < E_{2s}(Na)$$

Statement – II: The photoelectric effect explains the wave nature of light

The correct answer is

(A) Both statements – I and II are correct
(B) Statement – I is correct but Statement – II is not correct
(C) Statement – I is not correct but Statement – II is correct
(D) Both statements – I and II are not correct

Answer: (D) Both statements – I and II are not correct · The council's preliminary key

Q13 AP EAPCET 2026 · 13 May · Shift 1 MCQ

The energy of spectral line of lowest frequency in Lyman series of Li^{2+} spectrum is x J. The energy of second spectral line in Balmer series of He^{+} spectrum is y J. The ratio of x and y is

(A) $3 : 1$
(B) $1 : 3$
(C) $1 : 9$
(D) $9 : 1$

Answer: (D) $9 : 1$ · The council's preliminary key

Q14 AP EAPCET 2026 · 13 May · Shift 1 MCQ

Quantum number sets of four electrons I, II, III, IV are given below. The correct order of the energy of these electrons is

I. $n = 3, l = 1, m_l = -1, m_s = +\frac{1}{2}$

II. $n = 4, l = 1, m_l = 0, m_s = +\frac{1}{2}$

III. $n = 4, l = 2, m_l = -2, m_s = +\frac{1}{2}$

IV. $n = 3, l = 2, m_l = -1, m_s = -\frac{1}{2}$

The correct answer is

(A) $\mathrm{I} > \mathrm{IV} > \mathrm{II} > \mathrm{III}$
(B) $\mathrm{III} > \mathrm{II} > \mathrm{I} > \mathrm{IV}$
(C) $\mathrm{III} > \mathrm{IV} > \mathrm{II} > \mathrm{I}$
(D) $\mathrm{III} > \mathrm{II} > \mathrm{IV} > \mathrm{I}$

Answer: (D) $\mathrm{III} > \mathrm{II} > \mathrm{IV} > \mathrm{I}$ · The council's preliminary key

Q15 AP EAPCET 2026 · 13 May · Shift 1 MCQ

In which of the following, elements are correctly arranged in the increasing order of unpaired electrons?

(A) $\mathrm{Fe} < \mathrm{Co} < \mathrm{Ni} < \mathrm{Mn}$
(B) $\mathrm{Ni} < \mathrm{Co} < \mathrm{Mn} < \mathrm{Fe}$
(C) $\mathrm{Mn} < \mathrm{Fe} < \mathrm{Co} < \mathrm{Ni}$
(D) $\mathrm{Ni} < \mathrm{Co} < \mathrm{Fe} < \mathrm{Mn}$

Answer: (D) $\mathrm{Ni} < \mathrm{Co} < \mathrm{Fe} < \mathrm{Mn}$ · The council's preliminary key

Q16 AP EAPCET 2026 · 13 May · Shift 2 MCQ

If the radius of the first Bohr orbit of He^{+} is $26.45\ pm$, then the de Broglie wavelength (in m) associated with the electron present in its fourth orbit is ($\pi = 3.14$)

(A) 3.13×10^{-11}
(B) 1.33×10^{-11}
(C) 2.33×10^{-10}
(D) 3.32×10^{-10}

Answer: (D) 3.32×10^{-10} · The council's preliminary key

Q17 AP EAPCET 2026 · 13 May · Shift 2 MCQ

Consider the elements with atomic number (Z) from 11 to 18. The ratio of number of s-electrons to p-electrons in element X is $2:3$ and in element Y is $3:5$. What are X and Y?

(A) Mg, Al
(B) Si, P
(C) P, S
(D) S, Cl

Answer: (C) P, S · The council's preliminary key

Q18 AP EAPCET 2026 · 12 May · Shift 1 MCQ

In an atomic spectrum of hydrogen, a series of lines with wavelengths at 656.46, 486.27, x and 410.29 nm was obtained. What is the value of x (in nm)?

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$(R_H = 1.097 \times 10^7 m^{-1})$

(A) 453.15

(B) 449.32

(C) 434.17

(D) 428.37

Answer: (C) 434.17 · The council's preliminary key

Q19 AP EAPCET 2026 · 12 May · Shift 1 MCQ

If two particles have same kinetic energy, then the ratio of their de Broglie wavelengths ($\lambda_A : \lambda_B$) is (Given: $m_A = 4m_B$)

(A) $1 : 2$

(B) $2 : 1$

(C) $1 : 4$

(D) $4 : 1$

Answer: (A) $1 : 2$ · The council's preliminary key

Q20 AP EAPCET 2026 · 12 May · Shift 2 MCQ

Wavelength of a photon emitted during electron transition from $n = 4$ state to $n = 2$ state in the hydrogen atom is x nm. Wavelength of a photon emitted during electron transition from $n = 4$ state to $n = 1$ state in the same atom is y nm. $\frac{y}{x}$ is equal to

(A) 0.4

(B) 0.2

(C) 0.5

(D) 0.3

Answer: (B) 0.2 · The council's preliminary key

Q21 AP EAPCET 2026 · 12 May · Shift 2 MCQ

The de Broglie wavelength associated with a pebble of mass $6.63\ g$ travelling with velocity $\underline{x}\ ms^{-1}$ is 10^{-24} nm. What is the value of x?

$(h = 6.63 \times 10^{-34}\ Js)$

(A) 1.0×10^{-1}

(B) 1.0×10^{2}

(C) 1.0×10^{3}

(D) 1.0×10^{-2}

Answer: (B) 1.0×10^2 · The council's preliminary key

Q22 TS EAPCET 2026 · 11 May · Shift 1 MCQ

The energy of orbit X of Li^{2+} ($Z = 3$) is -2.18×10^{-18} J. What is the radius of the same orbit (in Å)?

(A) 2.116
(B) 2.105
(C) 1.587
(D) 2.645

Answer: (C) 1.587 · The council's preliminary key

Q23 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If ν_0 and ν represent the threshold frequency and frequency of incident light respectively, then the correct equation for the velocity of photoelectrons emitted from the metal surface will be

(A) $v = \sqrt{\frac{2h}{m}(\nu - \nu_0)}$
(B) $v = \sqrt{\frac{2h}{m}(\nu_0 - \nu)}$
(C) $v = \sqrt{\frac{m}{2h}(\nu - \nu_0)}$
(D) $v = \sqrt{\frac{m}{2hc}(\nu_0 - \nu)}$

Answer: (A) $v = \sqrt{\frac{2h}{m}(\nu - \nu_0)}$ · The council's preliminary key

Q24 TS EAPCET 2026 · 11 May · Shift 2 MCQ

The work function of three metals A, B and C is respectively 2.25, 2.42 and 3.6 eV. All the three metals were irradiated with light of wavelength 330 nm. The kinetic energy of photoelectrons emitted from A, B and C is respectively E_A, E_B and E_C. The correct relationship of E_A, E_B and E_C is

($h = 6.6 \times 10^{-34}$ Js; $c = 3 \times 10^8$ ms^{-1})

(A) $E_A > E_B > E_C$
(B) $E_A = E_B = E_C$
(C) $E_A < E_B < E_C$
(D) $E_C > E_A > E_B$

Answer: (A) $E_A > E_B > E_C$ · The council's preliminary key

Q25 TS EAPCET 2026 · 11 May · Shift 2 MCQ

Observe the given two statements about α-particle experiment and Rutherford assumptions.

Statement-I: The ratio of atomic radius to its nuclear radius is 10^5

Statement-II: In atom, majority of the space is vacant

The correct answer is

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(A) Both statements I and II are correct
(B) Statement I is correct, but statement II is not correct
(C) Statement I is not correct, but statement II is correct
(D) Both statements I and II are not correct

Answer: (A) Both statements I and II are correct · The council's preliminary key

Q26 TS EAPCET 2026 · 10 May · Shift 1 MCQ

The kinetic energy of photo electron emitted from the surface of a metal is 7.2×10^{-20} J , when the metal is made to strike with light having wavelength x nm. What is the value of x?

(Work function of metal = 4.5 eV; h = 6.6×10^{-34} Js; c = 3×10^{8} ms^{-1}; 1 eV = 1.6×10^{-19} J)

(A) 125
(B) 250
(C) 175
(D) 150

Answer: (B) 250 · The council's preliminary key

Q27 TS EAPCET 2026 · 10 May · Shift 1 MCQ

The wavelength of electron in the third orbit of hydrogen atom is $6\pi a_0$. The kinetic energy of electron (in J) is equal to

(Where, $K = \frac{h^2}{\pi^2 a_0^2 m_e}$; a_0 = radius of first orbit of hydrogen, m_e = mass of electron, h = Planck's constant)

(A) $\frac{K}{36}$
(B) $\frac{K}{108}$
(C) $\frac{K}{72}$
(D) $\frac{K}{18}$

Answer: (C) $\frac{K}{72}$ · The council's preliminary key

Q28 TS EAPCET 2026 · 10 May · Shift 2 MCQ

The radius of first Bohr orbit of hydrogen atom is r_o Å. The wavelength (in Å) of electron associated with sixth orbit of same atom is

(A) $6\pi r_o$
(B) $3\pi r_o$
(C) $8\pi r_o$
(D) $12\pi r_o$

Answer: (D) $12\pi r_o$ · The council's preliminary key

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Q29 TS EAPCET 2026 · 10 May · Shift 2 MCQ

The velocity of the photoelectron (in ms^{-1}) emitted when a smooth surface of a metal is made to strike with a photon of wavelength $4 \times 10^{-7}\,\mathrm{m}$ is
(W_0 of metal = 2.13 eV ; 1 eV = 1.6×10^{-19} J ; h = 6.6×10^{-34} Js ; m_e = 9.1×10^{-31} kg)

(A) $\frac{1}{\sqrt{5}} \times 10^6$
(B) $\frac{1}{\sqrt{3}} \times 10^5$
(C) $\frac{1}{\sqrt{3}} \times 10^6$
(D) $\frac{1}{\sqrt{7}} \times 10^5$

Answer: (C) $\frac{1}{\sqrt{3}} \times 10^6$ · The council's preliminary key

Q30 TS EAPCET 2026 · 9 May · Shift 1 MCQ

The ratio of wavenumber of first line of Balmer series and wavenumber of second line of Lyman series of hydrogen atom is

(A) $5 : 32$
(B) $32 : 5$
(C) $22 : 7$
(D) $7 : 22$

Answer: (A) $5 : 32$ · The council's preliminary key

Q31 TS EAPCET 2026 · 9 May · Shift 1 MCQ

The wavelength of electron in the orbit X of hydrogen atom is $6\pi a_0$, What is the value of X?

(a_0=Radius of first orbit of hydrogen atom)

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

Answer: (B) 3 · The council's preliminary key

Q32 TS EAPCET 2026 · 9 May · Shift 2 MCQ

In hydrogen atom, electron is present in n_x state. The energy of Lyman spectral line of hydrogen spectrum originated from n_x state is 1.635×10^{-18} J. What is the approximate energy (in J) required to excite this electron from n_x state to $(n_x + 1)$ state?

(A) 3×10^{-19}
(B) 3×10^{-18}
(C) 1.6×10^{-18}
(D) 3×10^{-20}

Answer: (A) 3×10^{-19} · The council's preliminary key

Q33 TS EAPCET 2026 · 9 May · Shift 2 MCQ

In H atom, electron is present in n_x state. The angular momentum of this electron is 1.051×10^{-34} Js. What is the energy (in J) required to excite this electron from n_x state to $(n_x + 1)$ state?
($h = 6.6 \times 10^{-34}$ Js; $\pi = 3.14$)

(A) 2.18×10^{-18}
(B) 0.545×10^{-18}
(C) 1.93×10^{-19}
(D) 1.635×10^{-18}

Answer: (D) 1.635×10^{-18} · The council's preliminary key

Q34 AP EAPCET 2025 · 27 May · Shift 1 MCQ

The wavelength of a particular electron transition for He^+ is 100 nm. The wavelength (in Å) of H atom for the same transition is

(A) 1000
(B) 100
(C) 4000
(D) 2000

Answer: (C) 4000 · The council's preliminary key

Q35 AP EAPCET 2025 · 27 May · Shift 1 MCQ

The energy of second Bohr orbit of hydrogen atom is -3.4 eV. The energy of the fourth Bohr orbit of the He^+ ion will be

(A) -3.4 eV
(B) -13.6 eV
(C) -6.8 eV
(D) -0.85 eV

Answer: (A) -3.4 eV · The council's preliminary key

Q36 AP EAPCET 2025 · 26 May · Shift 1 MCQ

The work function of Cu is 7.68×10^{-19} J. If photons of wavelength 221 nm are made to strike the surface of the metal, the kinetic energy (in J) of the ejected electrons will be (h = 6.63×10^{-34} Js)

(A) 2.64×10^{-18}
(B) 1.32×10^{-19}
(C) 2.64×10^{-19}
(D) 6.60×10^{-19}

Answer: (B) 1.32×10^{-19} · The council's preliminary key

Q37 AP EAPCET 2025 · 26 May · Shift 1 MCQ

In an element with atomic number (Z) 25, the number of electrons with $(n + l)$ value equal to 3 and 4 are x and y respectively. The value of $(x + y)$ is

(A) 21
(B) 12
(C) 14
(D) 16

Answer: (D) 16 · The council's preliminary key

Q38 AP EAPCET 2025 · 26 May · Shift 2 MCQ

a, b, c, d are electromagnetic radiations. Frequencies of a, b are 3×10^{15} Hz, 2×10^{14} Hz, respectively, whereas wavelength of c, d are 400 nm, 750 nm, respectively. The increasing order of their energies is

(A) b, d, c, a
(B) a, d, c, b
(C) a, b, c, d
(D) b, c, d, a

Answer: (A) b, d, c, a · The council's preliminary key

Q39 AP EAPCET 2025 · 26 May · Shift 2 MCQ

The number of electrons with magnetic quantum number, $\mathrm{m}_l = 0$ in the elements with atomic numbers $Z = 24$ and $Z = 29$ are respectively

(A) 12, 13
(B) 12, 12
(C) 13, 12
(D) 14, 15

Answer: (A) 12, 13 · The council's preliminary key

Q40 AP EAPCET 2025 · 24 May · Shift 1 MCQ

Which of the following represents the wavelength of spectral line of Balmer series of He^+ ion?

(R = Rydberg constant, n > 2)

(A) $\frac{n^2}{R(n-2)(n+2)}$
(B) $\frac{R(n-2)(n+2)}{n^2}$
(C) $\frac{n^2}{4R(n-2)(n+2)}$
(D) $\frac{4R(n-2)(n+2)}{n^2}$

Answer: (A) $\frac{n^2}{R(n-2)(n+2)}$ · The council's preliminary key

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Q41 AP EAPCET 2025 · 24 May · Shift 1 MCQ

The work functions (in eV) of Mg, Cu, Ag, Na respectively are 3.7, 4.8, 4.3, 2.3. From how many metals, the electrons will be ejected if their surfaces are irradiated with an electromagnetic radiation of wavelength 300 nm ?

($\mathrm{h} = 6.6 \times 10^{-34}$ Js, $1\,\mathrm{eV} = 1.6 \times 10^{-19}$ J)

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

Answer: (C) 2 · The council's preliminary key

Q42 AP EAPCET 2025 · 23 May · Shift 1 MCQ

The radius of fourth orbit in He^+ ion is 'R_1' pm and radius of third orbit in Li^{2+} ion is 'R_2' pm. The value of $(\mathrm{R}_1 - \mathrm{R}_2)$ in pm is

(A) 132.25
(B) 529.00
(C) 264.50
(D) 793.50

Answer: (C) 264.50 · The council's preliminary key

Q43 AP EAPCET 2025 · 23 May · Shift 1 MCQ

The deBroglie wavelengths of two fast moving particles X, Y are 1 nm, 3 nm respectively. Mass of X is nine times the mass of Y. The ratio of kinetic energies of X, Y is

(A) $1:3$
(B) $1:1$
(C) $9:1$
(D) $1:9$

Answer: (B) $1:1$ · The council's preliminary key

Q44 AP EAPCET 2025 · 23 May · Shift 2 MCQ

The uncertainty in the velocities of two particles A and B are 0.03 and 0.01 $\mathrm{m\,s^{-1}}$ respectively. The mass of B is four times to the mass of A. The ratio of uncertainties in their positions is

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

Answer: (A) $\frac{4}{3}$ · The council's preliminary key

Q45 AP EAPCET 2025 · 23 May · Shift 2 MCQ

The total maximum number of electrons possible in 3d, 6d, 5s and 4f orbitals with m_l (magnetic quantum number) value -2 is

(A) 6
(B) 8
(C) 10
(D) 12

Answer: (A) 6 · The council's preliminary key

Q46 AP EAPCET 2025 · 23 May · Shift 2 MCQ

Identify the set containing isoelectronic species.

(A) $\mathrm{N_2, O_2^{2-}, NO^+}$
(B) $\mathrm{N_2, CO, NO^+}$
(C) $\mathrm{F_2, O_2^{2-}, N_2}$
(D) $\mathrm{N_2, O_2^{2+}, C_2}$

Answer: (B) $\mathrm{N_2, CO, NO^+}$ · The council's preliminary key

Q47 AP EAPCET 2025 · 22 May · Shift 1 MCQ

The wavenumber of the first line ($\mathrm{n_2 = 3}$) in the Balmer series of hydrogen is $\overline{\mathrm{v}}_1$ $\mathrm{cm^{-1}}$. What is the wavenumber (in $\mathrm{cm^{-1}}$) of the second line ($\mathrm{n_2 = 4}$) in the Balmer series of $\mathrm{He^+}$?

(A) $\frac{5\overline{\mathrm{v}}_1}{27}$
(B) $\frac{27\overline{\mathrm{v}}_1}{5}$
(C) $\frac{27\overline{\mathrm{v}}_1}{20}$
(D) $\frac{20\overline{\mathrm{v}}_1}{27}$

Answer: (B) $\frac{27\overline{\mathrm{v}}_1}{5}$ · The council's preliminary key

Q48 AP EAPCET 2025 · 22 May · Shift 1 MCQ

Which of the following sets of quantum numbers is not possible for the electron?

(A) $n = 3,\ l = 1,\ m = 0\ s = +\frac{1}{2}$
(B) $n = 4,\ l = 0,\ m = 0\ s = -\frac{1}{2}$
(C) $n = 3,\ l = 3,\ m = -3\ s = +\frac{1}{2}$
(D) $n = 1,\ l = 0,\ m = 0\ s = -\frac{1}{2}$

Answer: (C) $n = 3,\ l = 3,\ m = -3\ s = +\frac{1}{2}$ · The council's preliminary key

Q49 AP EAPCET 2025 · 22 May · Shift 2 MCQ

The difference between the radii of 3rd and 2nd orbit of H-atom is x pm. The difference between the radii of 4th and 3rd orbit of Li^{2+} ion is y pm. $y : x$ is equal to

(A) $15 : 7$
(B) $7 : 15$
(C) $3 : 1$
(D) $1 : 3$

Answer: (B) $7 : 15$ · The council's preliminary key

Q50 AP EAPCET 2025 · 22 May · Shift 2 MCQ

The de Broglie wavelength of an electron in the third Bohr orbit of H-atom is

(A) $3\pi \times 5.29$ pm
(B) $4\pi \times 52.9$ pm
(C) $6\pi \times 52.9$ pm
(D) $2\pi \times 5.29$ pm

Answer: (C) $6\pi \times 52.9$ pm · The council's preliminary key

Q51 AP EAPCET 2025 · 21 May · Shift 1 MCQ

When a metal surface is irradiated with light of frequency x Hz, the kinetic energy of emitted photoelectrons is z J. When the same metal is irradiated with light of frequency y Hz, the kinetic energy of emitted electrons is $\frac{z}{3}$ J. What is the threshold frequency (in Hz) of metal ?

(A) $\frac{3}{2}(y - x)$
(B) $\left(\frac{3y-x}{2}\right)$
(C) $\left(\frac{2y-x}{3}\right)$
(D) $\frac{2}{3}(y - x)$

Answer: (B) $\left(\frac{3y-x}{2}\right)$ · The council's preliminary key

Q52 AP EAPCET 2025 · 21 May · Shift 1 MCQ

Identify the correct statements from the following

I) Isotopes of an element show different chemical behaviour

II) Lyman series of lines of hydrogen spectrum appear in UV region

III) The oscillating electric and magnetic field components of electromagnetic radiation are perpendicular to each other and both are perpendicular to the direction of propagation of radiation

(A) II & III only
(B) I & II only
(C) I & III only
(D) I, II, III

Answer: (A) II & III only · The council's preliminary key

Q53 AP EAPCET 2025 · 21 May · Shift 2 MCQ

The uncertainty in the position of electron (Δx) is approximately 100 pm. The uncertainty in momentum (in $\mathrm{kg\ m\ s^{-1}}$) of an electron is [h = 6.626×10^{-34} Js]

(A) 1.104×10^{-22}
(B) 0.527×10^{-27}
(C) 0.527×10^{-24}
(D) 1.055×10^{-24}

Answer: (C) 0.527×10^{-24} · The council's preliminary key

Q54 AP EAPCET 2025 · 21 May · Shift 2 MCQ

Which of the following statements are correct ? (only)

I) The energy of hydrogen atom in its ground state is -13.6 eV

II) On the basis of Bohr's model, the radius of the 3rd orbit of hydrogen atom is 158.7 pm

III) The order of radius of the first orbit of H, $\mathrm{He^+}$, $\mathrm{Li^{2+}}$ and $\mathrm{Be^{3+}}$ is $\mathrm{H} > \mathrm{He^+} > \mathrm{Li^{2+}} > \mathrm{Be^{3+}}$

(A) II & III only
(B) I & III only
(C) I & II only
(D) I, II, III

Answer: (B) I & III only · The council's preliminary key

Q55 TS EAPCET 2025 · 4 May · Shift 1 MCQ

The radius of second orbit of hydrogen atom is same as that of orbit (n) of an ion (x).

n and x are respectively

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(A) 4, Be^{2+}
(B) 3, Li^{2+}
(C) 4, Be^{3+}
(D) 2, He^{+}

Answer: (C) 4, Be^{3+} · The council's preliminary key

Q56 TS EAPCET 2025 · 4 May · Shift 1 MCQ

An electromagnetic radiation of wavelength 331.5 nm is made to strike the surface of a metal. Electrons are emitted with a kinetic energy of $1.2 \times 10^5\ J\,mol^{-1}$. The work function (in eV) of the metal is
$(h = 6.63 \times 10^{-34}\ Js,\ N_A = 6 \times 10^{23}\ mol^{-1})$

(A) 1.5
(B) 3.0
(C) 3.5
(D) 2.5

Answer: (D) 2.5 · The council's preliminary key

Q57 TS EAPCET 2025 · 4 May · Shift 2 MCQ

Observe the following statements

Statement-I : Rutherford model of an atom cannot explain the stability of an atom

Statement-II : The wavelength of X-rays is higher than the wavelength of microwaves

The correct answer is

(A) Both statements I and II are correct
(B) Both statements I and II are not correct
(C) Statement I is correct, but statement II is not correct
(D) Statement I is not correct, but statement II is correct

Answer: (C) Statement I is correct, but statement II is not correct · The council's preliminary key

Q58 TS EAPCET 2025 · 4 May · Shift 2 MCQ

In hydrogen atom, an electron is transferred from an orbit of radius 1.3225 nm to another orbit of radius 0.2116 nm. What is the energy (in J) of emitted radiation?

(A) 1.635×10^{-18}
(B) 3.027×10^{-19}
(C) 4.087×10^{-19}
(D) 0.4578×10^{-18}

Answer: (D) 0.4578×10^{-18} · The council's preliminary key

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Q59 TS EAPCET 2025 · 3 May · Shift 1 MCQ

The energy associated with electron in first orbit of hydrogen atom is -2.18×10^{-18} J. The frequency of the light required (in Hz) to excite the electron to fifth orbit is

($h = 6.6 \times 10^{-34}$ Js)

(A) 2.17×10^{16}

(B) 3.17×10^{14}

(C) 2.17×10^{15}

(D) 3.17×10^{15}

Answer: (D) 3.17×10^{15} · The council's preliminary key

Q60 TS EAPCET 2025 · 3 May · Shift 1 MCQ

In Sr ($Z = 38$), the number of electrons with $l = 0$ is x, number of electrons with $l = 2$ is y. $(x - y)$ is equal to

(l = Azimuthal quantum number)

(A) 0

(B) 8

(C) -2

(D) 2

Answer: (A) 0 · The council's preliminary key

Q61 TS EAPCET 2025 · 3 May · Shift 2 MCQ

In the atomic spectrum of hydrogen, the wavelengths of the spectral lines corresponding to electronic transitions (i) n = 4 to n = 2 and (ii) n = 3 to n = 1 are λ_1 and λ_2 Å respectively. The value of $(\lambda_1 - \lambda_2)$ (in cm) is

(R_H = Rydberg constant)

(A) $\frac{1}{R_H}\left[\frac{24}{101}\right]$

(B) $R_H\left[\frac{24}{101}\right]$

(C) $\frac{1}{R_H}\left[\frac{101}{24}\right]$

(D) $R_H\left[\frac{101}{24}\right]$

Answer: (C) $\frac{1}{R_H}\left[\frac{101}{24}\right]$ · The council's preliminary key

Q62 TS EAPCET 2025 · 3 May · Shift 2 MCQ

Work functions of four metals M_1, M_2, M_3 and M_4 are 4.8, 4.3, 4.75 and 3.75 eV respectively. The metals which do not show photoelectric effect when light of wavelength 310 nm falls on the metals are

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(A) M_1, M_2 only
(B) M_1, M_3 only
(C) M_1, M_2, M_3 only
(D) M_1, M_2, M_4 only

Answer: (C) M_1, M_2, M_3 **only** · The council's preliminary key

Q63 TS EAPCET 2025 · 2 May · Shift 1 MCQ

The radius of stationary state $(n = 2)$ of hydrogen atom is x pm. The radius of stationary state $(n = 3)$ of He^+ ion (in pm) is

(A) $\frac{9}{8x}$
(B) $\frac{9x}{8}$
(C) $\frac{16x}{9}$
(D) $\frac{9}{16x}$

Answer: (B) $\frac{9x}{8}$ · The council's preliminary key

Q64 TS EAPCET 2025 · 2 May · Shift 1 MCQ

When electromagnetic radiation of wavelength 310 nm falls on the surface of a metal having work function 3.55 eV, the velocity of photoelectrons emitted is $x \times 10^5\ ms^{-1}$. The value of x is (Nearest integer)

$(m_e = 9 \times 10^{-31}\ kg)$

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

Answer: (B) 4 · The council's preliminary key

Q65 TS EAPCET 2025 · 2 May · Shift 2 MCQ

The electron in hydrogen atom undergoes transition from higher orbits to an orbit of radius 476.1 pm. This transition corresponds to which of the following series?

(A) Lyman
(B) Paschen
(C) Balmer
(D) Pfund

Answer: (B) Paschen · The council's preliminary key

Q66 TS EAPCET 2025 · 2 May · Shift 2 MCQ

Identify the incorrect statement from the following?

(A) m_l designates the orientation of the orbital
(B) The probability density of electron is expressed by $|\psi|^3$
(C) The total information about electron in atom is stored in its ψ
(D) Total number of orbitals in a sub level is equal to $(2l+1)$

Answer: (B) The probability density of electron is expressed by $|\psi|^3$ · The council's preliminary key

Q67 AP EAPCET 2024 · 23 May · Shift 1 MCQ

The sum of number of angular nodes and radial nodes for 4d orbital is

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

Answer: (B) 3 · The council's preliminary key

Q68 AP EAPCET 2024 · 23 May · Shift 1 MCQ

If the position of the electron was measured with an accuracy of ± 0.002 nm, the uncertainty in the momentum of it would be (in $\mathrm{kg\,ms^{-1}}$) ($h = 6.626 \times 10^{-34}$ J s)

(A) 2.637×10^{-23}
(B) 2.637×10^{-24}
(C) 8.283×10^{-23}
(D) 8.283×10^{-24}

Answer: (A) 2.637×10^{-23} · The council's preliminary key

Q69 AP EAPCET 2024 · 22 May · Shift 1 MCQ

If the longest wavelength of spectral line of Paschen series of Li^{2+} ion spectrum is x Å, then the longest wavelength (in Å) of Lyman series of hydrogen spectrum is

(A) $\frac{12}{7x}$
(B) $\frac{7x}{12}$
(C) $\frac{20x}{27}$
(D) $\frac{27x}{20}$

Answer: (B) $\frac{7x}{12}$ · The council's preliminary key

Q70 AP EAPCET 2024 · 22 May · Shift 1 MCQ

If v_0 is the threshold frequency of a metal X, the correct relation between de Broglie wavelength (λ) associated with photoelectron and frequency (v) of the incident radiation is

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(A) $\lambda \propto \frac{1}{\sqrt{v - v_0}}$

(B) $\lambda \propto \frac{1}{(v - v_0)^{1/4}}$

(C) $\lambda \propto \frac{1}{(v - v_0)^{3/4}}$

(D) $\lambda \propto \sqrt{v - v_0}$

Answer: (A) $\lambda \propto \frac{1}{\sqrt{v - v_0}}$ · The council's preliminary key

Q71 AP EAPCET 2024 · 22 May · Shift 2 MCQ

The de Broglie wavelength of an electron with kinetic energy of 2.5 eV is (in m)

$(1\ \text{eV} = 1.6 \times 10^{-19}\ \text{J}, m_e = 9 \times 10^{-31}\ \text{kg})$

(A) $\frac{h \times 10^{-25}}{\sqrt{72}}$

(B) $\frac{h \times 10^{25}}{\sqrt{72}}$

(C) $\frac{\sqrt{72}}{h \times 10^{-25}}$

(D) $\frac{\sqrt{72}}{h \times 10^{25}}$

Answer: (B) $\frac{h \times 10^{25}}{\sqrt{72}}$ · The council's preliminary key

Q72 AP EAPCET 2024 · 22 May · Shift 2 MCQ

The ratio of ground state energy of Li^{2+}, He^{+}, H is

(A) $3 : 2 : 1$

(B) $1 : 2 : 3$

(C) $9 : 4 : 1$

(D) $1 : 4 : 9$

Answer: (C) $9 : 4 : 1$ · The council's preliminary key

Q73 AP EAPCET 2024 · 21 May · Shift 1 MCQ

The energy of third orbit of Li^{2+} ion (in J) is

(A) -2.18×10^{-18}

(B) -6.54×10^{-18}

(C) -7.3×10^{-19}

(D) $+2.18 \times 10^{-18}$

Answer: (A) -2.18×10^{-18} · The council's preliminary key

Q74 AP EAPCET 2024 · 21 May · Shift 1 MCQ

The number of d electrons in Fe is equal to which of the following?

i. Total number of 's' electrons of Mg

ii. Total number of 'p' electrons of Cl

iii. Total number of 'p' electrons of Ne

The correct option is

(A) i, ii only
(B) ii, iii only
(C) i, iii only
(D) i, ii, iii

Answer: (C) i, iii only · The council's preliminary key

Q75 AP EAPCET 2024 · 21 May · Shift 2 MCQ

The difference in radii between fourth and third Bohr orbits of He^+ (in m) is

(A) 2.64×10^{-10}
(B) 1.85×10^{-12}
(C) 1.85×10^{-10}
(D) 1.85×10^{-9}

Answer: (C) 1.85×10^{-10} · The council's preliminary key

Q76 AP EAPCET 2024 · 21 May · Shift 2 MCQ

If λ_0 and λ are respectively the threshold wavelength and wavelength of incident light, the velocity of photo electrons ejected from the metal surface is

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

Answer: (B) $\sqrt{\frac{2hc}{m}\left(\frac{\lambda_0 - \lambda}{\lambda\lambda_0}\right)}$ · The council's preliminary key

Q77 AP EAPCET 2024 · 20 May · Shift 1 MCQ

The angular momentum of an electron in a stationary state of Li^{2+} ($Z = 3$) is $3h/\pi$. The radius and energy of that stationary state are respectively

(A) $3.174\ \text{Å},\ -5.45 \times 10^{-19}\ \text{J}$
(B) $6.348\ \text{Å},\ -5.45 \times 10^{-19}\ \text{J}$
(C) $6.348\ \text{Å},\ +5.45 \times 10^{-18}\ \text{J}$
(D) $2.116\ \text{Å},\ -5.45 \times 10^{-19}\ \text{J}$

Answer: (B) $6.348\ \text{Å},\ -5.45 \times 10^{-19}\ \text{J}$ · The council's preliminary key

Q78 AP EAPCET 2024 · 20 May · Shift 1 MCQ

Identify the pair of elements in which number of electrons in $(n-1)$ shell is same

(A) Fe, Mn
(B) Zn, Fe
(C) K, Sc
(D) Mn, Cr

Answer: (D) Mn, Cr · The council's preliminary key

Q79 AP EAPCET 2024 · 20 May · Shift 2 MCQ

If uncertainty in position and momentum of an electron are equal, then uncertainty in its velocity is

(A) $\frac{1}{2m}\sqrt{\frac{h}{\pi}}$
(B) $\frac{1}{m}\sqrt{\frac{h}{\pi}}$
(C) $\sqrt{\frac{h}{\pi}}$
(D) $m\sqrt{\frac{h}{\pi}}$

Answer: (A) $\frac{1}{2m}\sqrt{\frac{h}{\pi}}$ · The council's preliminary key

Q80 AP EAPCET 2024 · 20 May · Shift 2 MCQ

The graph between variation of probability density, $\Psi^2(r)$ and distance of the electron from the nucleus, r is shown below. This represents

(see the figure above)

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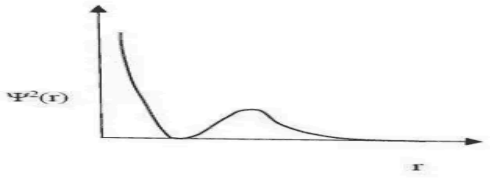
The graph between variation of probability density, $\Psi^2(r)$ and distance of the electron from the nucleus, r is shown below. This represents

సంభావ్యత సాంద్రతలో మార్పు $\Psi^2(r)$ మరియు కేంద్రకం నుంచి ఎలక్ట్రాన్ దూరం r ల మధ్య రేఖా పటం క్రింద చూపబడింది. ఇది సూచించేది



Options :

1. 1s — orbital
   1s- ఆర్బిటాల్
2. 2s — orbital
   2s - ఆర్బిటాల్
3. 3s — orbital
   3s - ఆర్బిటాల్
4. 2p- orbital
   2p - ఆర్బిటాల్

(A) 1s – orbital

(B) 2s – orbital

(C) 3s – orbital

(D) 2p- orbital

Answer: (B) 2s – orbital · The council's preliminary key

Q81 AP EAPCET 2024 · 19 May · Shift 2 MCQ

In the ground state of hydrogen atom, electron absorbs 1.5 times energy than the minimum energy $(2.18 \times 10^{-18}\ \text{J})$ to escape from the atom. The wavelength of the emitted electron (in m) is $(m_e = 9 \times 10^{-31}\ \text{kg})$

(A) $\dfrac{h \times 10^{24}}{\sqrt{1.962}}$

(B) $\dfrac{h}{\sqrt{1.962}} \times 10^{23}$

(C) $\dfrac{h}{\sqrt{1.962}} \times 10^{25}$

(D) $\dfrac{h}{\sqrt{1.962}} \times 10^{22}$

Answer: (A) $\dfrac{h \times 10^{24}}{\sqrt{1.962}}$ · The council's preliminary key

Q82 AP EAPCET 2024 · 19 May · Shift 2 MCQ

A golf ball of mass 'm' g has a speed of 50 m s^{-1}. If the speed can be measured within accuracy of 2%, the uncertainty in the position is

(A) $\frac{h}{4\pi m}$
(B) $\frac{h}{16\pi m}$
(C) $\frac{h}{4\pi m} \times 10^3$
(D) $\frac{h}{16\pi m} \times 10^3$

Answer: (C) $\frac{h}{4\pi m} \times 10^3$ · The council's preliminary key

Q83 AP EAPCET 2024 · 18 May · Shift 1 MCQ

The de Broglie wavelength of a particle of mass 1 mg moving with a velocity of $10\ \mathrm{ms}^{-1}$ is ($h = 6.63 \times 10^{-34}\ \mathrm{J\,s}$)

(A) $6.63 \times 10^{-29}\ \mathrm{m}$
(B) $6.63 \times 10^{-31}\ \mathrm{m}$
(C) $6.63 \times 10^{-34}\ \mathrm{m}$
(D) $6.63 \times 10^{-22}\ \mathrm{m}$

Answer: (A) $6.63 \times 10^{-29}\ \mathrm{m}$ · The council's preliminary key

Q84 AP EAPCET 2024 · 18 May · Shift 1 MCQ

Correct set of four quantum numbers for the valence electron of strontium ($Z = 38$) is

(A) $5, 0, 0, +\frac{1}{2}$
(B) $5, 1, 0, +\frac{1}{2}$
(C) $5, 1, 1, +\frac{1}{2}$
(D) $6, 0, 0, +\frac{1}{2}$

Answer: (A) $5, 0, 0, +\frac{1}{2}$ · The council's preliminary key

Q85 TS EAPCET 2024 · 11 May · Shift 1 MCQ

If n, l represent the principal and azimuthal quantum numbers respectively, the formula used to know the number of radial nodes possible for a given orbital is

(A) $(n - l)$
(B) $(n - l + 1)$
(C) $(n - l - 1)$
(D) $(n - 2)$

Answer: (C) $(n - l - 1)$ · The council's preliminary key

Q86 TS EAPCET 2024 · 11 May · Shift 1 MCQ

If the radius of first orbit of hydrogen like ion is 1.763×10^{-2} nm, the energy associated with that orbit (in J) is

(A) $+1.962 \times 10^{-17}$
(B) -1.962×10^{-17}
(C) -0.872×10^{-17}
(D) -2.18×10^{-18}

Answer: (B) -1.962×10^{-17} · The council's preliminary key

Q87 TS EAPCET 2024 · 10 May · Shift 1 MCQ

The wavenumber of first spectral line of Lyman series of He^{+} ion is $x\ m^{-1}$. What is the wavenumber (in m^{-1}) of second spectral line of Balmer series of Li^{2+} ion?

(A) $\frac{9x}{16}$
(B) $\frac{16x}{9}$
(C) $\frac{8x}{27}$
(D) $\frac{27x}{8}$

Answer: (A) $\frac{9x}{16}$ · The council's preliminary key

Q88 TS EAPCET 2024 · 10 May · Shift 1 MCQ

The uncertainty in determination of position of a small ball of mass 10 g is 10^{-33} m. With what % of accuracy its speed can be measured, if it has a speed of 52.5 ms^{-1}?

(h $= 6.6 \times 10^{-34}$ Js)

(A) 1.0 %
(B) 20 %
(C) 10 %
(D) 2.0 %

Answer: (C) 10 % · The council's preliminary key

Q89 TS EAPCET 2024 · 10 May · Shift 2 MCQ

The wavelength of an electron is 10^{3} nm. What is its momentum in $kg\ m\ s^{-1}$?

($h = 6.625 \times 10^{-34}\ J\ s$)

(A) 6.625×10^{-31}
(B) 6.625×10^{-37}
(C) 6.625×10^{-28}
(D) 6.625×10^{-34}

Answer: (C) 6.625×10^{-28} · The council's preliminary key

Q90 TS EAPCET 2024 · 10 May · Shift 2 MCQ

Two statements are given below

Statement I: In H atom, the energy of 2s and 2p orbitals is same

Statement II: In He atom, the energy of 2s and 2p orbitals is same

The correct answer is

(A) Both statements I and II are correct
(B) Both statements I and II are not correct
(C) Statement I is correct but statement II is not correct
(D) Statement I is not correct but statement II is correct

Answer: (C) Statement I is correct but statement II is not correct · The council's preliminary key

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Q91 TS EAPCET 2024 · 9 May · Shift 1 MCQ

Identify the pair of species having same energy from the following (The number given in the bracket corresponds to principal quantum number (n) in which the electron is present)

(A) $\mathrm{H}(\mathrm{n}=1), \mathrm{Li}^{2+}(\mathrm{n}=1)$
(B) $\mathrm{Li}^{2+}(\mathrm{n}=3), \mathrm{Be}^{3+}(\mathrm{n}=4)$
(C) $\mathrm{He}^{+}(\mathrm{n}=1), \mathrm{Li}^{2+}(\mathrm{n}=3)$
(D) $\mathrm{H}(\mathrm{n}=3), \mathrm{Li}^{2+}(\mathrm{n}=2)$

Answer: (B) $\mathrm{Li}^{2+}(\mathrm{n}=3), \mathrm{Be}^{3+}(\mathrm{n}=4)$ · The council's preliminary key

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Q92 TS EAPCET 2024 · 9 May · Shift 1 MCQ

Which one of the following corresponds to the wavelength of line spectrum of H atom in its Balmer series? (R = Rydberg constant)

(A) $\frac{9}{8\mathrm{R}}$
(B) $\frac{100}{21\mathrm{R}}$
(C) $\frac{25}{24\mathrm{R}}$
(D) $\frac{16}{15\mathrm{R}}$

Answer: (B) $\frac{100}{21\mathrm{R}}$ · The council's preliminary key

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Q93 TS EAPCET 2024 · 9 May · Shift 1 MCQ

Identify the pair of elements in which the number of s-electrons to p-electrons ratio is 2:3

(A) P, Mg
(B) P, Ca
(C) O, Mg
(D) O, S

Answer: (B) P, Ca · The council's preliminary key

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Q94 TS EAPCET 2024 · 9 May · Shift 2 MCQ

The kinetic energy of electrons emitted, when radiation of frequency 1.0×10^{15} Hz hits a metal, is 2×10^{-19} J. What is the threshold frequency of the metal (in Hz)?

($h = 6.6 \times 10^{-34}$ Js)

(A) 3.5×10^{15}

(B) 3.3×10^{14}

(C) 6.97×10^{15}

(D) 6.97×10^{14}

Answer: (D) 6.97×10^{14} · The council's preliminary key

Q95 TS EAPCET 2024 · 9 May · Shift 2 MCQ

In which of the following species, the ratio of s – electrons to p – electrons is same?

(A) K^+, Cr^{3+}

(B) Zn, Fe^{2+}

(C) Zn, Cr^{3+}

(D) Na^+, K^+

Answer: (A) K^+, Cr^{3+} · The council's preliminary key

Q96 AP EAPCET 2023 · 19 May · Shift 1 MCQ

Which of the following sets of quantum numbers is correct for an electron in 4f orbital?

(A) $n = 3,\ \ell = 2,\ m_\ell = -2,\ m_s = +\frac{1}{2}$

(B) $n = 4,\ \ell = 3,\ m_\ell = +1,\ m_s = +\frac{1}{2}$

(C) $n = 4,\ \ell = 3,\ m_\ell = +4,\ m_s = +\frac{1}{2}$

(D) $n = 4,\ \ell = 4,\ m_\ell = -4,\ m_s = -\frac{1}{2}$

Answer: (B) $n = 4,\ \ell = 3,\ m_\ell = +1,\ m_s = +\frac{1}{2}$ · The council's preliminary key

Q97 AP EAPCET 2023 · 19 May · Shift 1 MCQ

Total number of angular nodes of orbitals associated with third shell ($n = 3$) of an atom is

(A) 3

(B) 4

(C) 2

(D) 1

Answer: (A) 3 · The council's preliminary key

Q98 AP EAPCET 2023 · 18 May · Shift 1 MCQ

The de Broglie wavelength of a particle is 1000 nm. What is its momentum?

(h $= 6.6 \times 10^{-34}$ J s)

(A) $6.6 \times 10^{-25}\ \mathrm{J\,s\,m^{-1}}$

(B) $6.6 \times 10^{-25}\ \mathrm{J\,s\,m}$

(C) $6.6 \times 10^{-28}\ \mathrm{J\,s\,m^{-1}}$

(D) $6.6 \times 10^{-26}\ \mathrm{J\,s\,m}$

Answer: (C) $6.6 \times 10^{-28}\ \mathrm{J\,s\,m^{-1}}$ · The council's preliminary key

Q99 AP EAPCET 2023 · 18 May · Shift 1 MCQ

If the uncertainty in velocity of electron (Δv) is 0.1 m/s, the uncertainty in its position (Δx) is

(given: $m_e = 9.1 \times 10^{-31}$ kg)

(A) 2.02×10^{-4} m

(B) 4.04×10^{-4} m

(C) 5.79×10^{-4} m

(D) 8.42×10^{-4} m

Answer: (C) 5.79×10^{-4} m · The council's preliminary key

Q100 AP EAPCET 2023 · 18 May · Shift 2 MCQ

In which of the following, orbitals are correctly arranged in the increasing order of their energies?

(A) $4f < 5p < 5d < 6s$

(B) $5p < 4f < 6s < 5d$

(C) $5p < 6s < 4f < 5d$

(D) $5p < 5d < 4f < 6s$

Answer: (C) $5p < 6s < 4f < 5d$ · The council's preliminary key

Q101 AP EAPCET 2023 · 18 May · Shift 2 MCQ

The energy (in J) released when an excited electron of 5th orbit of hydrogen atom returns to its ground state is

(A) 2.091×10^{-18}

(B) 4.182×10^{-18}

(C) 6.273×10^{-18}

(D) 8.364×10^{-18}

Answer: (A) 2.091×10^{-18} · The council's preliminary key

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Q102 AP EAPCET 2023 · 17 May · Shift 1 MCQ

Identify the region of spectral lines of electromagnetic spectrum, when electron transition takes place from higher energy levels to $n = 3, 4, 5$ in atomic spectrum of hydrogen is

(A) Ultraviolet
(B) Visible
(C) Infrared
(D) Microwave

Answer: (C) Infrared · The council's preliminary key

Q103 AP EAPCET 2023 · 17 May · Shift 1 MCQ

Maximum number of electrons theoretically possible for an orbit with principal quantum number $n = 6$ in an atom is

(A) 27
(B) 98
(C) 72
(D) 50

Answer: (C) 72 · The council's preliminary key

Q104 AP EAPCET 2023 · 17 May · Shift 2 MCQ

The angular momentum of electron in H atom in a particular n state is $\frac{h}{\pi}$. What is the energy in J required to excite the electron from this particular n state to (n+1) state?

$(x = +2.18 \times 10^{-18}\ \text{J})$

(A) x
(B) $\frac{5x}{36}$
(C) $\frac{36x}{5}$
(D) $\frac{3x}{4}$

Answer: (B) $\frac{5x}{36}$ · The council's preliminary key

Q105 AP EAPCET 2023 · 17 May · Shift 2 MCQ

A photon of wavelength $3000\ \text{Å}$ strikes a metal surface. The work function of the metal is 2.13 eV. What is the kinetic energy of the emitted photoelectron?

$(h = 6.626 \times 10^{-34}\ \text{Js})$

(A) 4.0 eV
(B) 3.0 eV
(C) 2.0 eV
(D) 1.0 eV

Answer: (C) 2.0 eV · The council's preliminary key

Q106 AP EAPCET 2023 · 16 May · Shift 1 MCQ

Which of the following electronic transitions in hydrogen atom will require the highest energy?

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

Answer: (B) $n = 1$ to $n = 2$ · The council's preliminary key

Q107 AP EAPCET 2023 · 16 May · Shift 2 MCQ

The number of d - electrons in Cr^{3+} ion (Z = 24) is

(A) 6
(B) 4
(C) 3
(D) 8

Answer: (C) 3 · The council's preliminary key

Q108 AP EAPCET 2023 · 16 May · Shift 2 MCQ

The laser in an audio compact disc uses light of wavelength 7.8×10^2 nm. What is the frequency of light emitted by laser?

(A) $1.8 \times 10^{14}\ s^{-1}$
(B) $2.6 \times 10^{14}\ s^{-1}$
(C) $5.4 \times 10^{14}\ s^{-1}$
(D) $3.8 \times 10^{14}\ s^{-1}$

Answer: (D) $3.8 \times 10^{14}\ s^{-1}$ · The council's preliminary key

Q109 AP EAPCET 2023 · 15 May · Shift 1 MCQ

Vijayawada FM radio station broadcasts at frequency of 103.4 MHz. The wavelength of the corresponding radio waves (in m) is

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(A) 2.90
(B) 29.0
(C) 9.20
(D) 92.0

Answer: (A) 2.90 · The council's preliminary key

Q110 AP EAPCET 2023 · 15 May · Shift 1 MCQ

The minimum number of quantum numbers required to specify an orbital in an atom is

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

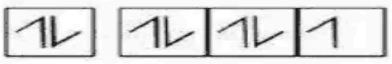
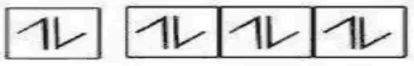
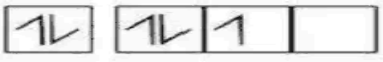
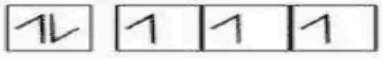
Answer: (D) 3 · The council's preliminary key

Q111 AP EAPCET 2023 · 15 May · Shift 2 MCQ

Which of the following electron arrangement does not obey Hund's rule?

Which of the following electron arrangement does not obey Hund's rule?
క్రింది వాటిలో ఏ ఎలక్ట్రాన్ అమరిక హుండ్ నియమాన్ని పాటించదు?

Options :

1. 
2. 
3. 
4. 

(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (C) · The council's preliminary key

Q112 AP EAPCET 2023 · 15 May · Shift 2 MCQ

The de Broglie wavelength of an electron travelling with 20% of velocity of light is

($h = 6.626 \times 10^{-34}$ J s; $m_e = 9.1 \times 10^{-31}$ kg)

(A) 2.4×10^{-11} m

(B) 1.2×10^{-11} m

(C) 3.6×10^{-11} m

(D) 4.8×10^{-11} m

Answer: (B) 1.2×10^{-11} m · The council's preliminary key

Q113 TS EAMCET 2023 · 14 May · Shift 1 MCQ

The energy of second orbit of hydrogen atom is -5.45×10^{-19} J. What is the energy of first orbit of Li^{2+} ion (in J)?

(A) -1.962×10^{-18}

(B) -1.962×10^{-17}

(C) -3.924×10^{-17}

(D) -3.924×10^{-18}

Answer: (B) -1.962×10^{-17} · The council's preliminary key

Q114 TS EAMCET 2023 · 14 May · Shift 1 MCQ

The number of electrons with $(n + l)$ values equal to 3, 4 and 5 in an element with atomic number (z) 24 are respectively

(n = principal quantum number and l = azimuthal quantum number)

(A) 7, 8, 5

(B) 6, 8, 6

(C) 8, 7, 5

(D) 8, 8, 5

Answer: (C) 8, 7, 5 · The council's preliminary key

Q115 TS EAMCET 2023 · 14 May · Shift 2 MCQ

A 100 watt bulb emits light of wavelength 'x'Å. What is the value of x, if the number of photons emitted is 2.0×10^{20} s^{-1}? (h= 6.63×10^{-34} Js, 1 watt = 1 Js^{-1})

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(A) 3578
(B) 4978
(C) 3978
(D) 4578

Answer: (C) 3978 · The council's preliminary key

Q116 TS EAMCET 2023 · 14 May · Shift 2 MCQ

The ratio of the difference in energy between the first and second Bohr orbits to that between the second and third orbits is

(A) $\frac{5}{27}$
(B) $\frac{27}{5}$
(C) $\frac{4}{9}$
(D) $\frac{9}{4}$

Answer: (B) $\frac{27}{5}$ · The council's preliminary key

Q117 TS EAMCET 2023 · 13 May · Shift 1 MCQ

The radius of first Bohr orbit of hydrogen atom is same as that of orbit (n) of hydrogen like species X. (n) and X respectively are

(A) (2) , Li^{2+}
(B) (3) , Li^{2+}
(C) (2) , Be^{3+}
(D) (2) , He^{+}

Answer: (C) (2) , Be^{3+} · The council's preliminary key

Q118 TS EAMCET 2023 · 13 May · Shift 1 MCQ

Identify the impossible quantum number set for the electron from the following

(A) $n = 2, l = 0, m = 0, s = -\frac{1}{2}$
(B) $n = 2, l = 1, m = 0, s = \frac{1}{2}$
(C) $n = 3, l = 3, m = 1, s = \frac{1}{2}$
(D) $n = 4, l = 2, m = 1, s = \frac{1}{2}$

Answer: (C) $n = 3, l = 3, m = 1, s = \frac{1}{2}$ · The council's preliminary key

Q119 TS EAMCET 2023 · 13 May · Shift 2 MCQ

What is the approximate angular momentum (in J s) of electron in hydrogen atom in its ground state? (h = 6.625×10^{-34} J s)

(A) 2110×10^{-37}
(B) 2110×10^{-36}
(C) $1055 \times 10^{-37}\ \mathrm{J\,s}$
(D) 1055×10^{-36}

Answer: (C) $1055 \times 10^{-37}\ \mathrm{J\,s}$ · The council's preliminary key

Q120 TS EAMCET 2023 · 13 May · Shift 2 MCQ

The energy of electron in hydrogen atom when present in n=1, n=2 and n=3 will be in the ratio of

(A) $25 : 16 : 9$
(B) $16 : 9 : 4$
(C) $36 : 9 : 4$
(D) $3 : 2 : 1$

Answer: (C) $36 : 9 : 4$ · The council's preliminary key

Q121 TS EAMCET 2023 · 12 May · Shift 1 MCQ

The radius of third orbit of hydrogen atom is R pm. The radius of second orbit of He^{+} ion (in pm is)

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

Answer: (D) $\frac{2}{9}R$ · The council's preliminary key

Q122 TS EAMCET 2023 · 12 May · Shift 1 MCQ

The threshold frequency of a metal is $10^{15}\ s^{-1}$. The ratio of maximum kinetic energies of the photoelectrons, when the metal is made to strike with radiations of frequencies $1.5 \times 10^{15}\ s^{-1}$ and $2.0 \times 10^{15}\ s^{-1}$ respectively is

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

Answer: (B) $1 : 2$ · The council's preliminary key

Q123 TS EAMCET 2023 · 12 May · Shift 2 MCQ

The wavelength of second line of Balmer series of hydrogen atom is λ nm. What is the wavelength of first line of Lyman series of He^{+} ion (in nm)?

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(A) $\frac{\lambda}{16}$
(B) $\frac{16}{\lambda}$
(C) $\frac{16}{3\lambda}$
(D) $\frac{3\lambda}{16}$

Answer: (A) $\frac{\lambda}{16}$ · The council's preliminary key

Q124 TS EAMCET 2023 · 12 May · Shift 2 MCQ

Consider the following

I. The electron spin quantum number describes the orientation of the spin of the nucleus with respect to the magnetic field

II. The orbitals represented by the quantum numbers $n = 3, l = 2, m = +2$ and $n = 3, l = 2, m = -2$ have the same energy

III. The energy of a photon is directly proportional to wavelength but inversely proportional to wave number

IV. Lyman series of lines appear in ultra-violet region

The correct statements are

(A) II & IV only
(B) I & II only
(C) II, III & IV only
(D) I, III & IV only

Answer: (A) II & IV only · The council's preliminary key

Q125 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

The maximum number of orbitals present in n = 4 energy level of an atom and the maximum number of electrons with spin value $+\frac{1}{2}$ in the same orbitals are _____, respectively.

(A) 16, 5
(B) 16, 7
(C) 16, 9
(D) 16, 16

Answer: (D) 16, 16 · The council's preliminary key

Q126 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

The approximate ratio of the speed of light in vacuum to that of an electron in the first Bohr orbit of hydrogen atom is

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(A) 100 : 1
(B) 137 : 1
(C) 157 : 1
(D) 191 : 1

Answer: (B) 137 : 1 · The council's preliminary key

Q127 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

Which of the following species are isoelectronic species?
a) O^{2-} b) F^{-} c) Na^{+} d) Mg^{2+}

(A) a, b, and c only
(B) a, c and d only
(C) c and d only
(D) a, b, c and d

Answer: (D) a, b, c and d · The council's preliminary key

Q128 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

Choose the correct statements in reference to the photoelectric effect.
a) There is no time lag between the striking of light and ejection of electrons from the metal surface.
b) The number of electrons ejected is independent of the intensity of light.
c) The elements K, Rb and Cs can show photoelectric effect when exposed to the beam of light.

(A) a and b only
(B) a and c only
(C) a, b, c
(D) b and c only

Answer: (B) a and c only · The council's preliminary key

Q129 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

Assertion (A) : Mo has the ground state electronic configuration $4d^5\ 5s^1$.
Reason (R) : Mo has the highest exchange energy among the second row transition elements.
The correct option among the following is

(A) (A) is true, (R) is true and (R) is the correct explanation for (A)
(B) (A) is true, (R) is true but (R) is not the correct explanation for (A)
(C) (A) is true but (R) is false
(D) (A) is false but (R) is true

Answer: (A) (A) is true, (R) is true and (R) is the correct explanation for (A) · The council's preliminary key

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Q130 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

If the uncertainty in velocity is $\frac{1}{2m}\sqrt{\frac{h}{\pi}}$, then the ratio of uncertainty in position and momentum is

(A) $10:1$
(B) $100:1$
(C) $1:1$
(D) $0.5:1$

Answer: (C) $1:1$ · The council's preliminary key

Q131 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

The valency shell electronic configuration of Cr and Cu atoms, respectively, are

(A) $3d^4 4s^2;\ 3d^{10} 4s^1$
(B) $3d^5 4s^1;\ 3d^{10} 4s^1$
(C) $3d^5 4s^1;\ 3d^9 4s^2$
(D) $3d^4 4s^2;\ 3d^9 4s^2$

Answer: (B) $3d^5 4s^1;\ 3d^{10} 4s^1$ · The council's preliminary key

Q132 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

If the radius and energy of the second Bohr orbit of hydrogen atom is r_2 and E_2, respectively. The radius and energy of the third Bohr orbit will be _____, _____ respectively.

(A) $\frac{4}{9}r_2, \frac{9}{4}E_2$
(B) $\frac{4}{9}r_2, \frac{4}{9}E_2$
(C) $\frac{9}{4}r_2, \frac{4}{9}E_2$
(D) $\frac{9}{4}r_2, \frac{9}{4}E_2$

Answer: (C) $\frac{9}{4}r_2, \frac{4}{9}E_2$ · The council's preliminary key

Q133 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

When a radiation of 300 nm is shined on five metals, namely, Li, Mg, Ag, Cu and K, the number of metals that show photoelectric effect are

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

Answer: (D) 3 · The council's preliminary key

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Q134 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

In hydrogen atom, the minimum energy required to excite an electron from 2nd orbit to the 3rd orbit is

(A) $2.2\ \text{eV}$
(B) $2.7\ \text{eV}$
(C) $1.9\ \text{eV}$
(D) $7\ \text{eV}$

Answer: (C) $1.9\ \text{eV}$ · The council's preliminary key

Q135 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

The velocity (V) of de Broglie wave is given by
[v = Frequency, m = mass, C = Velocity of light]

(A) mC^2
(B) $v\lambda$
(C) $\dfrac{hv}{\text{mC}}$
(D) $\dfrac{\text{C}^2}{v}$

Options (3) or (2) were accepted. More than one answer was accepted. · The council's preliminary key

Q136 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

The total number of spectral lines observed when electron returns from the 6th shell until the 2nd shell in hydrogen atom is

(A) 15
(B) 10
(C) 8
(D) 2

Answer: (B) 10 · Checked by our team

Q137 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

The orbital angular momentum of an electron in d orbital is equal to

(A) 0
(B) $2\sqrt{3}\ \hbar$
(C) $6\ \hbar$
(D) $\sqrt{6}\ \hbar$

Answer: (D) $\sqrt{6}\ \hbar$ · The council's preliminary key

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Q138 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

The sum of electrons present in all sub shells of an atom with m_s value of $+\frac{1}{2}$ for n=4 and m_s value of $-\frac{1}{2}$ for n=3 is

(A) 25
(B) 16
(C) 09
(D) 32

Answer: (A) 25 · The council's preliminary key

Q139 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

The radius of the first orbit of Li^{2+} is X $\mathring{A}$. The radius of the third orbit of He^{+} (in $\mathring{A}$) is

(A) $\frac{18}{2}x$
(B) $\frac{18}{3}x$
(C) $\frac{27}{4}x$
(D) $\frac{27}{2}x$

Answer: (D) $\frac{27}{2}x$ · The council's preliminary key

Q140 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

Which of the following element has two electrons in Q shell in its ground state?

(A) Ba
(B) Ra
(C) La
(D) Pb

Answer: (B) Ra · The council's preliminary key

Q141 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

While passing through the applied magnetic field, which of the following undergoes the maximum deflection?

(A) Stream of α- particles
(B) Stream of β- particles
(C) γ - rays
(D) Stream of neutrons

Answer: (B) Stream of β- particles · The council's preliminary key

Q142 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

An element has d^5 configuration. The total number of electron exchanges possible for it is

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(A) 18
(B) 10
(C) 12
(D) 15

Answer: (B) 10 · The council's preliminary key

Q143 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

The ratio of radii of second orbit of hydrogen atom to fourth orbit of He^+ ion is

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

Answer: (C) 1 : 2 · The council's preliminary key

Q144 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

The velocity of the electron in Bohr's first orbit is $x \times 10^6\ \mathrm{m\,s^{-1}}$. The deBroglie wave length associated with it (in nm) is ($m_e = 9 \times 10^{-31}$ kg, $h = 6.6 \times 10^{-34}$ J s)

(A) $\frac{x}{1.43}$
(B) $\frac{x}{0.73}$
(C) $\frac{0.73}{x}$
(D) $\frac{0.073}{x}$

Answer: (C) $\frac{0.73}{x}$ · The council's preliminary key

Q145 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

The element with the electronic configuration $[Kr]4d^{10}5s^0$ is

(A) Ag
(B) Pd
(C) Rh
(D) Tc

Answer: (B) Pd · The council's preliminary key

Q146 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

The two stable isotopes of carbon present in the naturally occurring carbon are

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(A) ^{12}C and ^{14}C
(B) ^{12}C and ^{13}C
(C) ^{12}C and ^{15}C
(D) ^{11}C and ^{12}C

Answer: (B) ^{12}C and ^{13}C · The council's preliminary key

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Q147 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

The outer electronic configuration of "Pd" is

(A) $4d^8 5s^2$
(B) $4d^9 5s^1$
(C) $4d^{10} 5s^0$
(D) $4d^{10} 5s^1$

Answer: (C) $4d^{10} 5s^0$ · The council's preliminary key

Q148 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

Work function (W_o) values of six metals (in eV) are given below:
Li 2.42, Mg 3.7, Cu 4.8, Ag 4.3, K 2.25, Na 2.3
How many of the above metals do not eject the electrons when they are made to strike with radiation of wavelength 400 nm?
($h = 6.62 \times 10^{-34}$ Js)

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

Answer: (C) 3 · The council's preliminary key

Q149 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

The work function of a metal M is 6.3 eV. The wave length of the incident radiation required to just eject the electrons from its surface (in nm) is

(A) 102
(B) 330
(C) 197
(D) 310

Answer: (C) 197 · The council's preliminary key

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Q150 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

The value of work function of a metal X is 3.1 eV. The threshold frequency of it (in Hz) (h = 6.62×10^{-34} J s)

(A) 6.49×10^{13}
(B) 5.49×10^{13}
(C) 6.49×10^{14}
(D) 7.49×10^{14}

Answer: (D) 7.49×10^{14} · The council's preliminary key

Q151 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

The wavelength of the electron in the ground state of hydrogen atom is y $\mathring{A}$. What is the wavelength of the electron in the fourth orbit of He^+ ion (in $\mathring{A}$) is

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

Answer: (A) 2y · The council's preliminary key

Q152 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

The spectral series formed when electrons of excited hydrogen atoms return to the third orbit from higher energy orbits is

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

Answer: (B) Paschen series · The council's preliminary key

Q153 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

The incorrect set of quantum numbers (n, l, m, s) for an electron in 3p orbital is

(A) $3, 1, -1, 1/2$
(B) $3, 1, -2, -1/2$
(C) $3, 1, 1, 1/2$
(D) $3, 1, +1, -1/2$

Answer: (B) $3, 1, -2, -1/2$ · The council's preliminary key

Q154 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

The wavelength associated with the electron moving in the first orbit of hydrogen atom with velocity $2.2 \times 10^6\ \mathrm{m\,s^{-1}}$ (in nm) is ($m_e = 9.0 \times 10^{-31}$ kg, $h = 6.6 \times 10^{-34}$ Js)

(A) 0.66
(B) 0.33
(C) 0.22
(D) 0.44

Answer: (B) 0.33 · The council's preliminary key

Q155 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

The energy required (in eV) to excite an electron of H-atom from the ground state to the third state is

(A) +0.85
(B) -3.4
(C) 12.1
(D) -12.1

Answer: (C) 12.1 · The council's preliminary key

Q156 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

The wavelength of electron in the first orbit of hydrogen atom is $3.3 \times 10^{-10}\ \mathrm{m}$. The kinetic energy of electron (in J) is

($h = 6.6 \times 10^{-34}$ Js, $m_e = 9.0 \times 10^{-31}$ kg)

(A) 3.33×10^{-17}
(B) 1.11×10^{-18}
(C) 2.22×10^{-18}
(D) 2.22×10^{-17}

Answer: (C) 2.22×10^{-18} · The council's preliminary key

Q157 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

Maximum number of electrons possible with spin quantum number $+\frac{1}{2}$ with principal quantum number n=4 in an atom is

(A) 16
(B) 9
(C) 4
(D) 25

Answer: (A) 16 · The council's preliminary key

Q158 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

If Δx is the uncertainty in position and $\Delta\vartheta$ is the uncertainty in velocity of a particle are equal, the correct expression for uncertainty in momentum for the same particle is

(A) $\frac{1}{4}\sqrt{\frac{mh}{\pi}}$
(B) $\frac{1}{3}\sqrt{\frac{mh}{2\pi}}$
(C) $\frac{1}{2}\sqrt{\frac{mh}{\pi}}$
(D) $\frac{1}{2}\sqrt{\frac{h}{m\pi}}$

Answer: (C) $\frac{1}{2}\sqrt{\frac{mh}{\pi}}$ · The council's preliminary key

Q159 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

The number of radial nodes, angular nodes of a 4f- orbital are respectively

(A) 0, 3
(B) 1, 2
(C) 2, 1
(D) 2, 0

Answer: (A) 0, 3 · The council's preliminary key

Q160 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

The maximum number of electrons present in an orbital with n = 4, l = 3 is

(A) 06
(B) 14
(C) 10
(D) 2

Answer: (D) 2 · The council's preliminary key

Q161 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

Which quantum number provides information about the shape of an orbital?

(A) Spin quantum number
(B) Azimuthal quantum number
(C) Magnetic quantum number
(D) Principal quantum number

Answer: (B) Azimuthal quantum number · The council's preliminary key

Q162 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

Identify the possible set of quantum numbers 'n', 'l', 'm' and 's' respectively for the outer most electron of copper, in its ground state.

(A) $4, 1, 1, \frac{+1}{2}$
(B) $3, 2, 2, \frac{+1}{2}$
(C) $4, 0, 0, \frac{+1}{2}$
(D) $4, 2, 2, \frac{+1}{2}$

Answer: (C) $4, 0, 0, \frac{+1}{2}$ · The council's preliminary key

Q163 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

The approximate ratio of the energy of a photon to that of an electron when both have the same wavelength of 0.2 nm is _____

(A) 1.6×10^{2}
(B) 1.0×10^{-2}
(C) 1.0×10^{2}
(D) 1.6×10^{-2}

Answer: (A) 1.6×10^{2} · The council's preliminary key

Q164 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

The ratio of area of the second orbit to that of the third orbit in an atom is _____

(A) $4 : 9$
(B) $8 : 27$
(C) $16 : 81$
(D) $9 : 4$

Answer: (C) $16 : 81$ · The council's preliminary key

Q165 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

The shortest wavelength in hydrogen spectrum is approximately _____

(A) $121\ \text{nm}$
(B) $91.2\ \text{nm}$
(C) $182\ \text{nm}$
(D) $89.2\ \text{nm}$

Answer: (B) $91.2\ \text{nm}$ · The council's preliminary key

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Q166 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

The ratio of de-Broglie wavelength of two particles A and B is $2:1$. If the velocities of A and B are $0.05\ \mathrm{m.s^{-1}}$ and $0.02\ \mathrm{m.s^{-1}}$, respectively, then the ratio of their masses $m_A : m_B$ must be _____

(A) $5:1$
(B) $10:1$
(C) $1:5$
(D) $1:8$

Answer: (C) $1:5$ · The council's preliminary key

Q167 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

If the maximum kinetic energy of photoelectrons ejected from a metal surface when it is irradiated with a radiation of frequency $4 \times 10^{14}\ \mathrm{s^{-1}}$ is $6.63 \times 10^{-20}\ \mathrm{J}$, then the threshold frequency of the metal is _____

(A) $2 \times 10^{14}\ \mathrm{s^{-1}}$
(B) $1 \times 10^{14}\ \mathrm{s^{-1}}$
(C) $3 \times 10^{14}\ \mathrm{s^{-1}}$
(D) $1 \times 10^{-14}\ \mathrm{s^{-1}}$

Answer: (C) $3 \times 10^{14}\ \mathrm{s^{-1}}$ · The council's preliminary key

Q168 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

Which of the following element, has the highest number of unpaired electrons in its ground state?

(A) Mn
(B) Cr
(C) Ni
(D) Fe

Answer: (B) Cr · The council's preliminary key

Q169 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

Which energy level transition among the following will have the least wavelength?

(A) $n_4 \rightarrow n_3$
(B) $n_4 \rightarrow n_2$
(C) $n_4 \rightarrow n_1$
(D) $n_2 \rightarrow n_1$

Answer: (C) $n_4 \rightarrow n_1$ · The council's preliminary key

Q170 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

Calculate the de Broglie's wavelength of an electron residing in the 2nd Bohr's orbit of a Hydrogen atom. (Bohr's radius, $a_o = 0.529$ Å)

(A) 0.2116 nm
(B) $2.116\,\pi$ Å
(C) 21.16 m
(D) $2.116\ \mu$m

Answer: (B) $2.116\,\pi$ Å · The council's preliminary key

Q171 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

If the wavelength of the first line in Balmer series is 656 nm, then the wavelengths of its second line and limiting line respectively are _____

(A) 485.9 nm & 434 nm
(B) 485.9 nm & 364.4 nm
(C) 715 nm & 434 nm
(D) 608 nm & 415.2 nm

Answer: (B) 485.9 nm & 364.4 nm · The council's preliminary key

Q172 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

If a proton is accelerated to a velocity of 3×10^7 m.s^{-1} which is accurate up to ± 0.5 %, then the uncertainty in its position will be _____ [mass of proton $= 1.66 \times 10^{-27}$ kg, $h = 6.6 \times 10^{-34}$ J.s]

(A) 1.55×10^{-12} m
(B) 3.24×10^{-13} m
(C) 1.58×10^{-13} m
(D) 2.11×10^{-13} m

Answer: (D) 2.11×10^{-13} m · The council's preliminary key

Q173 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

Find the uncertainty in the position of an electron which is moving with a velocity of 2.99×10^4 cm.s^{-1}, accurate up to 0.0016 %. (Given, $m_e = 9.1 \times 10^{-28}$ g, $h = 6.626 \times 10^{-27}$ erg.s)

(A) 1.211 mm
(B) 2.99×10^{-10} mm
(C) 0.121 mm
(D) 12.11 mm

Answer: (D) 12.11 mm · The council's preliminary key

Q174 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

If the uncertainty in momentum and uncertainty in the position of a particle are equal, then the uncertainty in its velocity would be given by _____

(A) $\Delta v \geq \sqrt{\frac{h}{2\pi}}$

(B) $\Delta v \geq \frac{1}{2m}\sqrt{\frac{h}{\pi}}$

(C) $\Delta v \geq \sqrt{\frac{h}{\pi}}$

(D) $\Delta v \geq \frac{1}{m}\sqrt{\frac{h}{\pi}}$

Answer: (B) $\Delta v \geq \frac{1}{2m}\sqrt{\frac{h}{\pi}}$ · The council's preliminary key

Q175 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

In the electronic configuration of which of the given elements, 'Aufbau principle' or $(n+l)$ rule is violated?

(A) Mn

(B) Ga

(C) La

(D) Pu

Answer: (C) La · The council's preliminary key

Q176 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

To which orbital among the following may an electron having zero angular momentum belong?

(A) $3s$

(B) $3p$

(C) $3d$

(D) $4f$

Answer: (A) $3s$ · The council's preliminary key

Q177 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

The electron in an hydrogen atom jump on absorbing $12.75\ eV$ of energy would jump to _____ orbit

(A) 3

(B) 2

(C) 5

(D) 4

Answer: (D) 4 · The council's preliminary key

Q178 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

Assertion (A): Helium & Beryllium have similar outer electronic configuration ns^2
Reason (R): Both are chemically inert

(A) Both (A) & (R) are correct & (R) is the correct explanation of (A)
(B) Both (A) & (R) are correct but (R) is not the correct explanation of (A)
(C) (A) is correct but (R) is incorrect
(D) Both (A) & (R) are incorrect

Answer: (C) (A) is correct but (R) is incorrect · The council's preliminary key

Q179 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

With what velocity must an electron travel so that its momentum is equal to that of a photon of wavelength $663\ nm$?

(A) $1098\ m/s$
(B) $109.8\ m/s$
(C) $10.98\ m/s$
(D) $1.098\ m/s$

Answer: (A) $1098\ m/s$ · The council's preliminary key

Q180 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

Which orbital among the following has zero radial nodes and 2 angular nodes?

(A) $4s$
(B) $3d$
(C) $2p$
(D) $5s$

Answer: (B) $3d$ · The council's preliminary key

Q181 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

Two particles of masses m & $2m$ have equal Kinetic energies. The de-Broglie wavelength are in the ratio of _____

(A) $1:1$
(B) $1:2$
(C) $1:\sqrt{2}$
(D) $\sqrt{2}:1$

Answer: (D) $\sqrt{2}:1$ · The council's preliminary key

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Q182 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

Which of the following atoms, in its ground state, has the highest number of unpaired electrons?

(A) Chromium [Z = 24]
(B) Iron [Z = 26]
(C) Manganese [Z = 25]
(D) Vanadium [Z = 23]

Answer: (A) Chromium [Z = 24] · The council's preliminary key

Q183 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

Calculate the mass of an elementary particle, which is accelerated to twice the velocity of light with the precision $\pm$ 1% and has $1.05 \times 10^{-13}\ m$ uncertainty in position. ($h = 6.6 \times 10^{-34}\ kg\ m^2\ s^{-1}$)

(A) $8.34 \times 10^{-27}\ kg$
(B) $0.0083\ kg$
(C) $0.83 \times 10^{-27}\ kg$
(D) $0.834 \times 10^{-28}\ kg$

Answer: (D) $0.834 \times 10^{-28}\ kg$ · The council's preliminary key

Q184 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

Among the following, which transition in the Hydrogen spectrum would have the same wavelength as Balmer transition, $n = 4$ to $n = 2$ in He^+ spectrum?

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

Answer: (D) $n = 2 \longrightarrow n = 1$ · The council's preliminary key

Q185 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

The number of protons, neutrons and electrons in $^{13}_{6}\mathrm{C}$ respectively are _____

(A) 6, 7, 6
(B) 13, 6, 6
(C) 6, 7, 13
(D) 6, 6, 13

Answer: (A) 6, 7, 6 · The council's preliminary key

Q186 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

The masses of an electron, a proton and a neutron respectively will be in the ratio _____

(A) 1 : 1836.15 : 1838.68
(B) 1 : 1856.15 : 1858.68
(C) 1 : 1834.15 : 1836.68
(D) 1 : 1846.15 : 1848.68

Answer: (A) 1 : 1836.15 : 1838.68 · The council's preliminary key

Q187 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

Match the following species with the correct number of electrons present in them:
Species: (i) Be^{2+} (ii) H^{+} (iii) Na^{+} (iv) Mg^{+}
Number of Electrons: (a) 0 (b) 10 (c) 2 (d) 11 (e) 4

(A) (i-d), (ii-c), (iii-b), (iv-a)
(B) (i-a), (ii-b), (iii-c), (iv-d)
(C) (i-e), (ii-d), (iii-a), (iv-c)
(D) (i-c), (ii-a), (iii-b), (iv-d)

Answer: (D) (i-c), (ii-a), (iii-b), (iv-d) · The council's preliminary key

Q188 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

A subshell $n = 3,\ l = 2$ can accommodate maximum of _____

(A) 10 electrons
(B) 6 electrons
(C) 18 electrons
(D) 16 electrons

Answer: (A) 10 electrons · The council's preliminary key

Q189 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

If the work function for the photoelectron emission of a metal is $3.75\ eV$, then the threshold wave length of the radiation needed for the ejection of the electron is approximately _____

(A) $315\ nm$
(B) $280\ nm$
(C) $330\ nm$
(D) $290\ nm$

Answer: (C) $330\ nm$ · The council's preliminary key

Q190 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

With increasing Principal Quantum number, the energy difference between adjacent energy levels in H-atom _____

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(A) Decreases
(B) Increases
(C) remain constant
(D) decreases at low level of 'n' & increases for higher value of 'n'

Answer: (A) Decreases · The council's preliminary key

Q191 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

If two particles A and B are moving with the same velocity, but wavelength of A is found to be double than that of B. Which of the following statements are correct?

(A) Both A and B have same mass
(B) Mass of A is half that of B
(C) Mass of B is half that of A
(D) Mass of B is one-fourth that of A

Answer: (B) Mass of A is half that of B · The council's preliminary key

Q192 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

The spectrum of Helium is expected to be similar to that of _____

(A) Li^{+}
(B) H
(C) Na
(D) He^{+}

Answer: (A) Li^{+} · The council's preliminary key

Q193 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

On the basis of Bohr's model, the radius of the 3rd orbit is _____

(A) Equal to the radius of 1st orbit
(B) 3 times the radius of 1st orbit
(C) 5 times the radius of 1st orbit
(D) 9 times the radius of 1st orbit

Answer: (D) 9 times the radius of 1st orbit · The council's preliminary key

Q194 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

Assuming that the incident radiation is capable of ejecting photo electrons from all the given metals, the lowest kinetic energy of the ejected photoelectron is observed with which of the given metals?

(A) Na
(B) Li
(C) Ag
(D) Cu

Answer: (D) Cu · The council's preliminary key

Q195 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

If the energies of two light radiations E_1 and E_2 are $25\ \mathrm{eV}$ and $100\ \mathrm{eV}$ respectively, then their respective wavelengths λ_1 and λ_2 would be in the ratio $\lambda_1 : \lambda_2 =$ _____

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

Answer: (B) $4 : 1$ · The council's preliminary key

Q196 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

The electron configuration of Fe^{3+} is _____ (atomic number of $\mathrm{Fe} = 26$)

(A) $[\mathrm{Ar}]\ 3d^5\ 4s^1$
(B) $[\mathrm{Ar}]\ 3d^6\ 4s^0$
(C) $[\mathrm{Ar}]\ 3d^5\ 4s^0$
(D) $[\mathrm{Ar}]\ 3d^6\ 4s^2$

Answer: (C) $[\mathrm{Ar}]\ 3d^5\ 4s^0$ · The council's preliminary key

Q197 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

Match the following
List I
A) Chadwick
B) Rutherford
C) Mosley
D) J. J. Thomson
List II
I) Cathode rays
II) X-rays spectra
III) Discovery of neutrons
IV) Nuclear atom model
The correct match is

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

Answer: (D) A-III, B-IV, C-II, D-I · The council's preliminary key

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Q198 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

The number of radial nodes in 3s and 2p orbitals, respectively are

(A) 2 ; 2
(B) 2 ; 0
(C) 0 ; 0
(D) 3 ; 2

Answer: (B) 2 ; 0 · The council's preliminary key

Q199 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

Based on the Bohr's theory of hydrogen atom, the speed of the electron, energy of the electron, and the radius of its orbit varies with the principal quantum number, respectively as

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

Answer: (D) $\frac{1}{n};\ \frac{1}{n^2};\ n^2$ · The council's preliminary key

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Q200 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

The energy (in eV) associated with the electron in the 1st orbit of Li^{2+} is

(A) -122.4
(B) -61.15
(C) -30.5
(D) -244.6

Answer: (A) -122.4 · The council's preliminary key

Q201 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

The number of unpaired electrons in Co^{2+}, is

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

Answer: (B) 3 · The council's preliminary key

Q202 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

A microscope using appropriate photons is engaged to track an electron in an atom within distance of 0.001 nm. What will be the uncertainty involved in measuring its velocity?

(A) 5.79×10^7 m/s
(B) 5.79×10^6 m/s
(C) 4.79×10^7 m/s
(D) 3.7×10^6 m/s

Answer: (A) 5.79×10^7 **m/s** · The council's preliminary key

Q203 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

An orbital with one angular node shows three maxima in its radial probability distribution curve, the orbital is?

(A) 3s
(B) 4p
(C) 5d
(D) 3p

Answer: (B) 4p · The council's preliminary key

Q204 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

The orbital with 4 radial and 1 angular nodes is

(A) $5P_y$
(B) $6P_z$
(C) $4d_{xy}$
(D) $5d_{yz}$

Answer: (B) $6P_z$ · The council's preliminary key

Q205 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

The ratio of the highest to the lowest wavelength of Lyman series is

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(A) 4 : 3
(B) 9 : 8
(C) 27 : 5
(D) 16 : 5

Answer: (A) 4 : 3 · The council's preliminary key

Q206 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

The relation between the stopping potential (V_0) and frequency (ν) is correctly represented in [ϕ = Work function]

(A) $V_0 = \frac{\phi}{e} - \frac{h\nu^2}{e}$
(B) $V_0 = \frac{he}{\nu} + \frac{\phi}{e}$
(C) $V_0 = \frac{h\nu}{e} - \frac{\phi}{e}$
(D) $V_0 = \frac{h\nu}{e^2}$

Answer: (C) $V_0 = \frac{h\nu}{e} - \frac{\phi}{e}$ · The council's preliminary key

Q207 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

Heisenberg's uncertainty principle is ingeneral (sic) significant to

(A) planets
(B) cricket ball of 500 g
(C) cars
(D) micro particles having a very high speed

Answer: (D) micro particles having a very high speed · The council's preliminary key

Q208 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

Which of the following relations is correct, if the wavelength (λ) is equal to the distance travelled by the electron in one second?
h is the planck's constant and m is the mass of electron

(A) $\lambda = h/p$
(B) $\lambda = h/m$
(C) $\lambda = \sqrt{h/p}$
(D) $\lambda = \sqrt{h/m}$

Answer: (D) $\lambda = \sqrt{h/m}$ · The council's preliminary key

Q209 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

Which of the following elements has the highest work function value?

(A) Na
(B) K
(C) Cu
(D) Ag

Answer: (C) Cu · The council's preliminary key

Q210 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

For an electron in the d-orbital, the orbital angular momentum is

(A) $\frac{h}{2\pi}$
(B) $\frac{\sqrt{2}h}{2\pi}$
(C) $\frac{\sqrt{6}h}{2\pi}$
(D) $\frac{\sqrt{6}h}{2\pi}$

Options (3) or (4) were accepted. More than one answer was accepted. · The council's preliminary key

Q211 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

Isobars are atoms with _____

(A) Same mass number and same atomic number
(B) Same atomic number and different mass number
(C) Same mass number and different atomic number
(D) Different atomic number and different mass number

Answer: (C) Same mass number and different atomic number · The council's preliminary key

Q212 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

Which of the following conclusions could not be derived from Rutherford's α -particle scattering experiment?

(A) Most of the space in the atom is empty.
(B) radius of the atom is about $10^{-10}\ m$ while that of nucleus is $10^{-15}\ m$.
(C) Electrons move in circular paths of fixed energy, called orbits.
(D) Electrons and the nucleus are held together by electrostatic forces of attraction.

Answer: (C) Electrons move in circular paths of fixed energy, called orbits. · The council's preliminary key

Q213 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

Which among the following is a correct statement based on Heisenberg's uncertainty principle?
1) It is impossible to determine exact position and exact momentum of an electron simultaneously
2) It is applicable to even macroscopic objects

3) It is possible to determine the exact position and momentum of an electron simultaneously
4) It is impossible to determine the exact position and momentum of macroscopic object simultaneously

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

Answer: (A) 1 · The council's preliminary key

Q214 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

Calculate the mass of a photon if its wave length is given as $0.35\ \text{nm}$.

(A) $2.20 \times 10^{-42}\ \text{kg}$
(B) $6.30 \times 10^{-33}\ \text{g}$
(C) $6.30 \times 10^{-33}\ \text{kg}$
(D) $18.92 \times 10^{-25}\ \text{kg}$

Answer: (C) $6.30 \times 10^{-33}\ \text{kg}$ · The council's preliminary key

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Q215 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

Which of the following models states that "In an atom, the positive charge is uniformly distributed and electrons are embedded into it"?

(A) Bohr's atomic model
(B) Thomson's atomic model
(C) Rutherford's atomic model
(D) Sommerfeld's atomic model

Answer: (B) Thomson's atomic model · The council's preliminary key

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Q216 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

Which of the following are isoelectronic species?

(A) $O^{2-}, F, Na^{+}, Mg^{+}$
(B) O, F^{-}, Na, Mg
(C) $O^{2-}, F^{-}, Na^{+}, Mg^{2+}$
(D) $O^{2-}, Cl^{-}, Na, Mg^{2+}$

Answer: (C) $O^{2-}, F^{-}, Na^{+}, Mg^{2+}$ · The council's preliminary key

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Q217 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

The number of electrons that can be present in subshells having m_s value of $\frac{-1}{2}$, for n up to 3

(A) 18
(B) 9
(C) 14
(D) 12

Answer: (C) 14 · The council's preliminary key

Q218 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

Calculate the energy associated with the second orbit of Li^{+} and find it's radius?

(A) 4.905×10^{-19} J, 0.0705 nm
(B) 4.905×10^{-20} J, 0.0705 Å
(C) 4.905×10^{-17} J, 0.0705 Å
(D) 4.905×10^{-18} J, 0.0705 nm

Answer: (D) 4.905×10^{-18} J, 0.0705 nm · The council's preliminary key

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Q219 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

If the binding energy of electrons in a metal is 250 $\mathrm{kJ/mol}$, what should be the threshold frequency of the striking photons in order to free an electron from the metal surface?

(A) $6.26 \times 10^{14}\ \mathrm{s^{-1}}$
(B) $12.4 \times 10^{14}\ \mathrm{s^{-1}}$
(C) $6.26 \times 10^{12}\ \mathrm{s^{-1}}$
(D) $12.4 \times 10^{12}\ \mathrm{s^{-1}}$

Answer: (A) $6.26 \times 10^{14}\ \mathrm{s^{-1}}$ · The council's preliminary key

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Q220 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

Which of the following statements is correct about the cathode rays?
1) These rays start from anode and move towards cathode
2) They are visible with human eye
3) In presence of electric and magnetic fields, they behave like positively charged particles
4) Their characteristic does not depend on the nature of material at electrode

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

Answer: (D) 4 · The council's preliminary key

Q221 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

Choose the correct option regarding:
Assertion: Energy of the orbital decreases with increase of 'n'
Reason: Energy is required in shifting away the negatively charged electron from positively charged nucleus

(A) Assertion and reasoning are correct statements and reason is the correct explanation for assertion
(B) Assertion and reasoning are correct statements and reason is not the explanation for assertion
(C) Assertion is correct, reason is wrong
(D) Assertion is wrong, reason is correct

Answer: (D) Assertion is wrong, reason is correct · The council's preliminary key

Q222 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

Calculate energy of half mole of photons of a radiation with frequency 3×10^{12} Hz.

(A) $598.2\ \text{kJ.mol}^{-1}$
(B) $0.598\ \text{kJ.mol}^{-1}$
(C) $1.196\ \text{kJ.mol}^{-1}$
(D) $119.6\ \text{kJ.mol}^{-1}$

Answer: (B) $0.598\ \text{kJ.mol}^{-1}$ · The council's preliminary key

Q223 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

The electronic configuration of Cs is

(A) $[\text{Kr}]\,5s^1$
(B) $[\text{Xe}]\,6s^1$
(C) $[\text{Rn}]\,7s^1$
(D) $[\text{Ar}]\,4s^1$

Answer: (B) $[\text{Xe}]\,6s^1$ · The council's preliminary key

Q224 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

Calculate the number of protons, neutrons and electrons in $^{32}_{16}\text{S}^{2-}$

(A) 14, 18, 16
(B) 16, 16, 14
(C) 18, 16, 14
(D) 16, 16, 18

Answer: (D) 16, 16, 18 · The council's preliminary key

Q225 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

Which of the following statements is correct about photoelectric effect?
A) The number of electrons ejected from metal surface is inversely proportional to intensity of light
B) Below threshold frequency, photoelectric effect can be observed
C) At higher frequency than threshold frequency, the ejected electrons have certain kinetic energy
D) At higher frequency than threshold frequency, the electron is still on the metal surface

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

Answer: (C) C · The council's preliminary key

Q226 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

"No two electrons in an atom can have the same set of all four quantum numbers". This principle is called

(A) Zeeman Effect
(B) Pauli's Exclusion Principle
(C) Stark Effect
(D) Heisenberg Principle

Answer: (B) Pauli's Exclusion Principle · The council's preliminary key

Q227 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

The uncertainty in the position of an electron moving with velocity of 3×10^4 cm/s is (given mass of electron $= 9.1 \times 10^{-28}$, uncertainty in velocity $= 0.2\%$)

(A) 1.8×10^{-3} cm
(B) 9×10^{-3} cm
(C) 3.8×10^{-2} cm
(D) 1.8×10^{-4} cm

Answer: (B) 9×10^{-3} **cm** · The council's preliminary key

Q228 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

Which among the following represents Schrodinger wave equation?

(A) $\frac{d^2\psi}{dx^2}+\frac{d^2\psi}{dy^2}+\frac{d^2\psi}{dz^2}+\frac{4\pi m}{h}(E-v)\psi=0$

(B) $\hat{H}=\frac{h}{4\pi^2 m}\left(\frac{d^2}{dx^2}+\frac{d^2}{dy^2}+\frac{d^2}{dz^2}\right)+V$

(C) $\hat{H}=\frac{-h^2}{8\pi^2 m}\left(\frac{d^2}{dx^2}+\frac{d^2}{dy^2}+\frac{d^2}{dz^2}\right)+P$

(D) $\frac{d^2\psi}{dx^2}+\frac{d^2\psi}{dy^2}+\frac{d^2\psi}{dz^2}+\frac{8\pi^2 m}{h^2}(E-V)\psi=0$

Answer: (D) $\frac{d^2\psi}{dx^2}+\frac{d^2\psi}{dy^2}+\frac{d^2\psi}{dz^2}+\frac{8\pi^2 m}{h^2}(E-V)\psi=0$ · The council's preliminary key

Q229 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

How many unpaired electrons will be present in the ground state of an atom which has valence electronic configuration $3d^6$ in its +3 oxidation state?

(A) 1

(B) 3

(C) 4

(D) 7

Answer: (B) 3 · The council's preliminary key

Q230 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

The de Broglie wavelength of a tennis ball of mass 60 g moving with a velocity of 10 $m.s^{-1}$ is approximately _____ (Planck's constant $h = 6.63 \times 10^{-34}$ J.s)

(A) $1.1 \times 10^{-31}\ m$

(B) $1.1 \times 10^{-33}\ m$

(C) $1.1 \times 10^{-34}\ m$

(D) $1.1 \times 10^{-32}\ m$

Answer: (B) $1.1 \times 10^{-33}\ m$ · The council's preliminary key

Q231 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

Calculate the wave number and frequency of orange radiation having wavelength 6300 Å.

(A) $1.587 \times 10^{8}\ \mathrm{m^{-1}}$, $4.761 \times 10^{16}\ \mathrm{s^{-1}}$

(B) $1.587 \times 10^{4}\ \mathrm{m^{-1}}$, $4.761 \times 10^{14}\ \mathrm{s^{-1}}$

(C) $1.587 \times 10^{6}\ \mathrm{m^{-1}}$, $4.761 \times 10^{14}\ \mathrm{s^{-1}}$

(D) $1.587 \times 10^{6}\ \mathrm{m^{-1}}$, $4.761 \times 10^{16}\ \mathrm{s^{-1}}$

Answer: (C) $1.587 \times 10^{6}\ \mathrm{m^{-1}}$, $4.761 \times 10^{14}\ \mathrm{s^{-1}}$ · The council's preliminary key

Q232 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

Find the exact orbital from the following for which $n = 4$ and $l = 1$

(A) $4s$
(B) $3d$
(C) $4d$
(D) $4p$

Answer: (D) $4p$ · The council's preliminary key

Q233 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

The number of protons, electrons and neutrons in a species are equal to 17, 18 and 18 respectively. Which of the following will be the proper symbol of this species?

(A) $^{35}_{17}\mathrm{Cl}$
(B) $^{35}_{17}\mathrm{Cl}^{-}$
(C) $^{36}_{17}\mathrm{Cl}$
(D) $^{36}_{17}\mathrm{Cl}^{-}$

Answer: (B) $^{35}_{17}\mathrm{Cl}^{-}$ · The council's preliminary key

Q234 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

Maximum number of electrons in a subshell with n = 4 and ℓ = 3 is

(A) 10
(B) 12
(C) 14
(D) 16

Answer: (C) 14 · Official TGCHE final key

Q235 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

From the following sets of quantum numbers, which set is possible?

(A) n = 1, ℓ = 0, m_ℓ = +1, $m_s = -\frac{1}{2}$
(B) n = 1, ℓ = 1, m_ℓ = 0 $m_s = +\frac{1}{2}$
(C) n = 3, ℓ = 1, m_ℓ = 0, $m_s = +\frac{1}{2}$
(D) n = 3, ℓ = 3, $m_\ell = -3$, $m_s = +\frac{1}{2}$

Answer: (C) n = 3, ℓ = 1, m_ℓ = 0, $m_s = +\frac{1}{2}$ · Official TGCHE final key

Q236 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

Given the ratio of kinetic energy of electron in two orbitals is 16:9. Calculate the ratio of wavelength of electron waves?

(A) 4 : 3
(B) 9 : 16
(C) 3 : 4
(D) 16 : 9

Answer: (C) 3 : 4 · Official TGCHE final key

Q237 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

Which of the following results is not true about photoelectric effect?

(A) The electrons are ejected from the metal surface as soon as the beam of light strikes to the surface.
(B) The number of electrons ejected is proportional to the intensity or brightness of light.
(C) There is a time lag between the striking of light beam and the ejection of electrons from the metal surface.
(D) For each metal, there is a characteristic minimum frequency below which photoelectric effect is not observed.

Answer: (C) There is a time lag between the striking of light beam and the ejection of electrons from the metal surface. · Official TGCHE final key

Q238 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

In the two elements ${}_{Z_1}A^{M_1}$ and ${}_{Z_2}B^{M_2}$, the following relations are true.
$M_1 \neq M_2$ and $Z_1 \neq Z_2$ but $M_1 - Z_1 = M_2 - Z_2$. These elements are
(M is atomic weight, Z is atomic number)

(A) Isotonic
(B) Isobaric
(C) Isotopic
(D) Isoelectronic

Answer: (A) Isotonic · Official TGCHE final key

Q239 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

The correct order of decreasing energy for the electrons whose quantum numbers, n and ℓ are given below, is

A) $n = 5$ and $\ell = 2$
B) $n = 5$ and $\ell = 0$
C) $n = 4$ and $\ell = 3$
D) $n = 4$ and $\ell = 1$

(A) $A > C > B > D$
(B) $A > B > C > D$
(C) $C > A > D > B$
(D) $A > B > D > C$

Answer: (A) $A > C > B > D$ · Official TGCHE final key

Q240 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

Find the correct set with iso electronic species?

(A) $N^{3-}, F^{-}, O_2, Ca^{2+}$
(B) $Ca^{2+}, Cl^{-}, Al^{3+}, O_2^{-}$
(C) $N^{3-}, Mg^{2+}, F^{-}, O^{2-}$
(D) $Mg^{2+}, O_2^{-}, Cl^{-}, N_3^{-}$

Answer: (C) $N^{3-}, Mg^{2+}, F^{-}, O^{2-}$ · Official TGCHE final key

Q241 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

The maximum number of possible electrons in a subshell with $n = 3$ and $\ell = 2$ is

(A) 10
(B) 12
(C) 14
(D) 16

Answer: (A) 10 · Official TGCHE final key

Q242 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

The uncertainty in position and velocity of a particle in motion are 1×10^{-8} m and 6.627×10^{-20} m/s, respectively. The mass of the particle is
($h = 6.627 \times 10^{-34}$ Js)

(A) $\frac{10^{-4}}{2\pi}$ kg
(B) $\frac{10^{-4}}{4\pi}$ kg
(C) $\frac{10^{-6}}{2\pi}$ kg
(D) $\frac{10^{-6}}{4\pi}$ kg

Answer: (D) $\frac{10^{-6}}{4\pi}$ kg · Official TGCHE final key

Q243 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

The degeneracy of the level of hydrogen atoms that contain the energy of $\left(\frac{-R_H}{16}\right)$ is

(A) 4
(B) 16
(C) 9
(D) 12

Answer: (B) 16 · Official TGCHE final key

Q244 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

Wavelength of H^+ ion with kinetic energy 1.68 eV is (Mass of proton $= 1.6726 \times 10^{-27}$ kg)

(A) 1.22 nm
(B) 0.22 nm
(C) 0.022 nm
(D) 0.122 nm

Answer: (C) 0.022 nm · Official TGCHE final key

Q245 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

Which of the following statements is not true about Thomson's model of atom?

(A) This model can be visualized as a pudding or watermelon of positive charge with plum or seeds as electrons embedded into it.
(B) The mass of the atom is assumed to be uniformly distributed over the atom.
(C) An atom possesses a spherical shape in which the positive charge is uniformly distributed.
(D) This model could not explain the overall neutrality of the atom.

Answer: (D) This model could not explain the overall neutrality of the atom. · Official TGCHE final key

Q246 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

Which of the following statements is not the result of cathode ray discharge tube experiment with perforated anode?

(A) In the absence of electric or magnetic field, the cathode rays travel in straight line.
(B) In the presence of electric or magnetic field, the behaviour of cathode rays is similar to that expected from negatively charged particles.
(C) In the presence of electric and magnetic field, the cathode rays travel in straight line.
(D) The cathode rays start from the cathode and move toward the anode.

Answer: (C) In the presence of electric and magnetic field, the cathode rays travel in straight line. · Official TGCHE final key

Q247 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

Two series of spectral lines of atomic hydrogen which do not belong to infrared spectral region are

(A) Lyman and Paschen
(B) Balmer and Brackett
(C) Pfund and Lyman
(D) Lyman and Balmer

Answer: (D) Lyman and Balmer · Official TGCHE final key

Q248 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

Which of the activities can be compared to the concept of quantisation?

(A) A car is travelling on the road
(B) An apple is falling from the tree
(C) A person can stand on any step of a stair case
(D) Throwing a playing disc

Answer: (C) A person can stand on any step of a stair case · Official TGCHE final key

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Q249 TS EAMCET 2019 · 6 May · Shift 1 MCQ

The speed of the electron (in ms^{-1}) in the third orbit of hydrogen atom is approximately
(Mass of electron = 9.1×10^{-31} kg)

(A) 3.6×10^5
(B) 2.18×10^6
(C) 7.26×10^5
(D) 2.18×10^5

Answer: (C) 7.26×10^5 · Official TGCHE final key

Q250 TS EAMCET 2019 · 6 May · Shift 1 MCQ

The ratio of the radius of second orbit of Li^{2+} to that of third orbit of Be^{3+} is

(A) $\frac{9}{8}$
(B) $\frac{8}{9}$
(C) $\frac{27}{16}$
(D) $\frac{16}{27}$

Answer: (D) $\frac{16}{27}$ · Official TGCHE final key

Q251 TS EAMCET 2019 · 4 May · Shift 1 MCQ

The maximum number of electrons that can have the set of quantum numbers $n = 4$, $m_l = 0$, and $m_s = \frac{1}{2}$ is

(A) 3
(B) 4
(C) 5
(D) 6

Answer: (B) 4 · Official TGCHE final key

Q252 TS EAMCET 2019 · 4 May · Shift 1 MCQ

Which of the following pairs has the identical e/m value?

(A) An α-particle and deuterium ion
(B) A proton and neutron
(C) An electron and γ-rays
(D) A proton and deuterium ion

Answer: (A) An α-particle and deuterium ion · Official TGCHE final key

Q253 TS EAMCET 2019 · 4 May · Shift 2 MCQ

In the Millikan's oil drop method, which of the following force does not act on the oil drop:

(A) Gravitational force
(B) Viscous force
(C) Magnetic force
(D) Electrostatic force

Answer: (C) Magnetic force · Official TGCHE final key

Q254 TS EAMCET 2019 · 4 May · Shift 2 MCQ

Which of the following series correctly represents the energy of the radiation?

(A) radio waves > X-rays > visible > IR
(B) UV > X-rays > IR > radio waves
(C) γ-rays > IR > visible > micro wave
(D) X-rays > UV > IR > micro wave

Answer: (D) X-rays > UV > IR > micro wave · Official TGCHE final key

Q255 TS EAMCET 2019 · 3 May · Shift 1 MCQ

From the following energy levels of hydrogen atom, the values of E_∞ and E_3 in J are, respectively *(see the figure above)*

Question Number : 121 Question Id : 7512364281 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

From the following energy levels of hydrogen atom, the values of E_∞ and E_3 in J are, respectively

క్రింది హైడ్రోజన్ పరమాణువు శక్తి స్థాయిల నుండి E_∞ మరియు E_3 విలువలు J లలో వరుసగా

E_∞ = ...

E_3 = ...

$E_2 = -0.545 \times 10^{-18}$ J

$E_1 = -2.18 \times 10^{-18}$ J

Options :

1. $1, \quad -0.242 \times 10^{-18}$
2. $\infty, \quad -0.726 \times 10^{-18}$
3. $0, \quad -0.242 \times 10^{-18}$
4. $0, \quad -0.321 \times 10^{-18}$

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(A) 1, -0.242×10^{-18}

(B) ∞, -0.726×10^{-18}

(C) 0, -0.242×10^{-18}

(D) 0, -0.321×10^{-18}

Answer: (C) 0, -0.242×10^{-18} · Official TGCHE final key

Q256 TS EAMCET 2019 · 3 May · Shift 1 MCQ

Match the following.

List - I

A) Nodes

B) Subsidiary Quantum Number

C) White light

D) Heisenberg uncertainty principle

List - II

I) Three dimensional shape of the orbital

II) Significant only for motion of microscopic objects

III) $|\psi|^2$ is zero

IV) Spin state of electron

V) Continuous spectrum

The correct answer is

(A) A-V, B-IV, C-II, D-I
(B) A-III, B-IV, C-V, D-II
(C) A-IV, B-III, C-II, D-I
(D) A-III, B-I, C-V, D-II

Answer: (D) A-III, B-I, C-V, D-II · Official TGCHE final key

Q257 TS EAMCET 2019 · 3 May · Shift 2 MCQ

The radius of the 2nd orbit of B^{4+} ion is:

(A) 4.23 Å
(B) 0.2340 Å
(C) 0.4232 Å
(D) 0.3241 Å

Answer: (C) 0.4232 Å · Official TGCHE final key

Q258 TS EAMCET 2019 · 3 May · Shift 2 MCQ

The product of uncertainty in the position and uncertainty in velocity of a particle is $5.79 \times 10^{-5}\ m^2s^{-1}$. If uncertainity in the position is 1 nm what is the uncertainty in the measurement of its velocity in $m\,s^{-1}$?

(A) 5.79×10^{7}
(B) 5.79×10^{5}
(C) 5.79×10^{-5}
(D) 5.79×10^{4}

Answer: (D) 5.79×10^{4} · Official TGCHE final key

Q259 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

The work function (W_0) of Li, K, Mg, Ag and Cu are 2.42, 2.25, 3.70, 4.30 and 4.80 eV respectively. The number of metals which undergo photoelectric effect if a radiation of wavelength 540 nm falls on them is
(1 eV = 1.602×10^{-19} J)

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

Answer: (C) 1 · Official APSCHE final key

Q260 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

What is the mass of a particle with a wavelength of 3.313 Å moving with a speed of $2.0 \times 10^{8}\ m\,s^{-1}$?

(A) 1.0×10^{-28} kg
(B) 2.0×10^{-32} kg
(C) 1.0×10^{-32} kg
(D) 2.0×10^{-28} kg

Answer: (C) 1.0×10^{-32} kg · Official APSCHE final key

Q261 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

If the electronic configuration of M^{3+} is $[Xe]\ 4f^3$, then M^{3+} is

(A) Nd^{3+}
(B) Pr^{3+}
(C) Sm^{3+}
(D) Dy^{3+}

Answer: (A) Nd^{3+} · Official APSCHE final key

Q262 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

If the kinetic energy of an electron of mass 9.0×10^{-31} kg is 2.0×10^{-25} J, the wavelength of the electron in nm is approximately

(A) 1004.3
(B) 1204.3
(C) 1104.3
(D) 994.3

Answer: (C) 1104.3 · Official APSCHE final key

Q263 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

If a suitable photon is employed to locate an electron (mass $= 9.11 \times 10^{-31}$ kg) in an atom within a distance of 10.98 nm, the uncertainty involved in the measurement of its velocity in ms^{-1} is

(A) $\frac{1.6565 \times 10^{6}}{\pi}$
(B) $\frac{1.6565 \times 10^{4}}{\pi}$
(C) $\frac{1.6565 \times 10^{-8}}{\pi}$
(D) $\frac{1.6565 \times 10^{8}}{\pi}$

Answer: (B) $\frac{1.6565 \times 10^{4}}{\pi}$ · Official APSCHE final key

Q264 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

The spectral line observed at 434 nm in the Balmer series of the hydrogen spectrum corresponds to a transition of an electron from the nth orbit. What is the value of n? (Rydberg constant $R_H = 109{,}677\ \text{cm}^{-1}$)

(A) 3
(B) 4
(C) 5
(D) 6

Answer: (C) 5 · Official APSCHE final key

Q265 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

The energy of 2s orbitals of H, He and Li follow the order

(A) $\text{He} < \text{H} < \text{Li}$
(B) $\text{Li} < \text{He} < \text{H}$
(C) $\text{Li} > \text{He} > \text{H}$
(D) $\text{He} > \text{H} > \text{Li}$

Answer: (B) $\text{Li} < \text{He} < \text{H}$ · Official APSCHE final key

Q266 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

The energies of an electron in first orbit of He^{+} and in third orbit of Li^{2+} in J are respectively

(A) -8.72×10^{-18}, -2.18×10^{-18}
(B) -8.72×10^{-18}, -1.96×10^{-17}
(C) -1.96×10^{-17}, -2.18×10^{-18}
(D) -8.72×10^{-17}, -1.96×10^{-17}

Answer: (A) -8.72×10^{-18}, -2.18×10^{-18} · Official APSCHE final key

Q267 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

How many orbital/s is/are possible with $n = 3$, $l = 1$, and $m_l = -1$ value?

(A) 2
(B) 3
(C) 5
(D) 1

Answer: (D) 1 · Official APSCHE final key

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Q268 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

Which of the following equations does represent the velocity (v) of the ejected electrons when a metal is made to strike with light of frequency v and threshold frequency of the metal is v_0? (m_e = mass of electron and h is Planck's constant)

(A) $v = \sqrt{\frac{h(v - v_0)}{m_e}}$

(B) $v = \sqrt{\frac{2h(v - v_0)}{m_e}}$

(C) $v = \sqrt{\frac{h(v - v_0)}{2m_e}}$

(D) $v = \sqrt{h(v - v_0)m_e}$

Answer: (B) $v = \sqrt{\frac{2h(v - v_0)}{m_e}}$ · Official APSCHE final key

Q269 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

An element with mass number 181 contains 32% more neutrons as compared to protons. What is the symbol of that element?

(A) Pt

(B) Pd

(C) Au

(D) Hg

Answer: (A) Pt · Official APSCHE final key

Q270 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

The wavelength of a microscopic particle of mass 9.1×10^{-31} kg is 182 nm, its kinetic energy in J is (h = 6.625×10^{-34} J s)

(A) 7.28×10^{-23}

(B) 7.28×10^{-24}

(C) 3.64×10^{-23}

(D) 3.64×10^{-24}

Answer: (B) 7.28×10^{-24} · Official APSCHE final key

Q271 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

The energy of an electron in an orbit of hydrogen like ion with an orbit radius of 52.9 pm in J is (ground state energy of electron in hydrogen atom is -2.18×10^{-18} J)

EdLoop EAPCET

(A) -4.36×10^{-18}
(B) -1.09×10^{-17}
(C) -8.72×10^{-18}
(D) -6.54×10^{-18}

Answer: (C) -8.72×10^{-18} · Official APSCHE final key

Q272 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

The energy associated with Bohr's orbit in the hydrogen atom is given by the expression, $E_n = -\frac{13.6}{n^2}$ eV. The energy in eV associated with the orbit having a radius $9r_1$ is (r_1 is the radius of the first orbit)

(A) -13.6
(B) -6.8
(C) -1.51
(D) -1.36

Answer: (C) -1.51 · Official APSCHE final key

Q273 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

When a certain metal was irradiated with light of frequency $4.0 \times 10^{16}\ s^{-1}$, the photoelectrons emitted had four times the kinetic energy as the kinetic energy of photoelectrons emitted when the same metal was irradiated with light of frequency $2.0 \times 10^{16}\ s^{-1}$. The threshold frequency (υ_0) of the metal in s^{-1} is

(A) 2×10^{16}
(B) 4×10^{16}
(C) 2.5×10^{16}
(D) 1.33×10^{16}

Answer: (D) 1.33×10^{16} · Official APSCHE final key

Q274 TS EAMCET 2018 · 7 May · Shift 1 MCQ

The wavelength (in Å) of a photon having energy 3 eV is approximately [1 eV = 1.6×10^{-12} erg] [h = 6.626×10^{-27} erg s]

(A) 3000
(B) 4000
(C) 4141
(D) 7824

Answer: (C) 4141 · The council's preliminary key

Q275 TS EAMCET 2018 · 7 May · Shift 1 MCQ

Which of the following set of radiations can not be seen in hydrogen atomic spectrum
a) γ-radiation
b) UV
c) X-rays
d) Infrared

(A) a, c, d
(B) c, d
(C) a, c
(D) a, d

Answer: (C) a, c · The council's preliminary key

Q276 TS EAMCET 2018 · 5 May · Shift 1 MCQ

In a photoelectric effect experiment, the kinetic energy of an emitted electron is 1.986×10^{-19} J, when a radiation of frequency $1.0 \times 10^{15}\ s^{-1}$ hits the metal. What is the threshold frequency of the metal (in s^{-1})?
(Planck's constant $= 6.62 \times 10^{-34}$ J s)

(A) 7.0×10^{14}
(B) 5.8886×10^{14}
(C) 7.0×10^{-15}
(D) 7.0×10^{15}

Answer: (A) 7.0×10^{14} · The council's preliminary key

Q277 TS EAMCET 2018 · 5 May · Shift 1 MCQ

The following plot represents the deBroglie wavelength as a function of the kinetic energy (k.e.) of two particles A and B. Identify the correct relation

(A) $m_A = m_B$
(B) $m_A < m_B$
(C) $m_A > m_B$
(D) $m_A = m_B = 0$

Answer: (C) $m_A > m_B$ · The council's preliminary key

Q278 TS EAMCET 2018 · 5 May · Shift 2 MCQ

When uncertainty in position and momentum are equal, then the uncertainty in velocity is

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(A) $\sqrt{\frac{h}{\pi}}$

(B) $\frac{1}{2}\sqrt{\frac{h}{\pi}}$

(C) $\frac{1}{2m}\sqrt{\frac{h}{\pi}}$

(D) $2m\sqrt{\frac{h}{\pi}}$

Answer: (C) $\frac{1}{2m}\sqrt{\frac{h}{\pi}}$ · The council's preliminary key

Q279 TS EAMCET 2018 · 5 May · Shift 2 MCQ

Which of the following are correct?

a) Electron density in XY plane for $d_{x^2-y^2}$ orbital is zero

b) The energy of 3p orbital is higher than the energy of 2p orbital

c) $3p_z$ orbital has one angular node

d) 4f orbital has no radial node

(A) a, b, c, d

(B) b, c, a

(C) b, c, d

(D) c, d, a

Answer: (C) b, c, d · The council's preliminary key

Q280 TS EAMCET 2018 · 4 May · Shift 1 MCQ

The energy of an electron in the 3rd orbit of H-atom (in J) is approximately.

(A) -2.18×10^{-18}

(B) -2.42×10^{-19}

(C) -1.21×10^{-19}

(D) -3.63×10^{-19}

Answer: (B) -2.42×10^{-19} · The council's preliminary key

Q281 TS EAMCET 2018 · 4 May · Shift 1 MCQ

The wavelength (in m) of a particle of mass 11.043×10^{-26} kg moving with a velocity of $6.0 \times 10^{7}\ ms^{-1}$ is

(A) 1.0×10^{16}
(B) 6.0×10^{-16}
(C) 1.0×10^{-16}
(D) 6.0×10^{16}

Answer: (C) 1.0×10^{-16} · The council's preliminary key

Q282 TS EAMCET 2018 · 4 May · Shift 2 MCQ

Calculate the number of protons, neutrons and electrons respectively in $^{14}_{7}\mathrm{N}^{3-}$

(A) 7, 10, 7
(B) 7, 7, 10
(C) 10, 7, 7
(D) 7, 7, 7

Answer: (B) 7, 7, 10 · The council's preliminary key

Q283 TS EAMCET 2018 · 4 May · Shift 2 MCQ

The order of filling of electrons in orbitals in Ti is

(A) 1s, 2s, 2p, 3s, 3p, 3d and 4s
(B) 1s, 2s, 2p, 3s, 3p, 4s and 3d
(C) 1s, 2s, 2p, 3s, 4s, 3p and 3d
(D) 1s, 2s, 2p, 3s, 3d, 3p and 4s

Answer: (B) 1s, 2s, 2p, 3s, 3p, 4s and 3d · The council's preliminary key

Q284 TS EAMCET 2018 · 4 May · Shift 2 MCQ

Relative abundance (in percentage) of $^{14}\mathrm{C}$ isotope is

(A) 1.1
(B) 2×10^{-10}
(C) 2×10^{-4}
(D) 2×10^{-5}

Answer: (B) 2×10^{-10} · The council's preliminary key

Q285 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

The work functions (W_0) of K, Na, Li, Mg and Cu are 2.25, 2.30, 2.42, 3.70 and 4.80 eV respectively. How many of these metals do not undergo photoelectric effect when a radiation of wavelength 450 nm is allowed to fall on them ? ($1\ \mathrm{eV} = 1.602 \times 10^{-19}\ \mathrm{J}$)

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(A) 2
(B) 1
(C) 3
(D) 5

Answer: (A) 2 · The council's preliminary key

Q286 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

Number of completely filled orbitals in Xenon atom (Xe) is

(A) 17
(B) 18
(C) 27
(D) 28

Answer: (C) 27 · The council's preliminary key

Q287 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

The mass numbers of two elements X and Z are 52 and 75 respectively. X contains 16.6% more neutrons compared to protons. Z contains 27.3% more neutrons compared to protons. X and Z are respectively

(A) $_{24}\mathrm{Cr},\ _{33}\mathrm{As}$
(B) $_{24}\mathrm{Cr},\ _{30}\mathrm{Zn}$
(C) $_{19}\mathrm{K},\ _{33}\mathrm{As}$
(D) $_{29}\mathrm{Cu},\ _{30}\mathrm{Zn}$

Answer: (A) $_{24}\mathrm{Cr},\ _{33}\mathrm{As}$ · The council's preliminary key

Q288 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

If the kinetic energy of an electron of mass $9.0 \times 10^{-31}\ \mathrm{kg}$ is $8.0 \times 10^{-25}\ \mathrm{J}$, the wavelength of this electron in nm is

(A) 1104.1
(B) 276.2
(C) 552.2
(D) 828.4

Answer: (C) 552.2 · The council's preliminary key

Q289 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

The radius ratio of Bohr's first orbit of hydrogen like species He^{+}, Li^{2+} and Be^{3+} is

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(A) $3:4:6$
(B) $2:3:4$
(C) $6:4:3$
(D) $4:3:2$

Answer: (C) $6:4:3$ · The council's preliminary key

Q290 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

The element Uuq contains 12.8% more neutrons compared to protons. What is the approximate mass number of it?

(A) 263
(B) 253
(C) 233
(D) 243

Answer: (D) 243 · The council's preliminary key

Q291 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

The ratio of de Broglie wave lengths of two particles, having mass ratio 1:3 and kinetic energy ratio 2:1 is

(A) $3:2$
(B) $\sqrt{3}:\sqrt{2}$
(C) $\sqrt{2}:\sqrt{3}$
(D) $2:3$

Answer: (B) $\sqrt{3}:\sqrt{2}$ · The council's preliminary key

Q292 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

If uncertainties in the measurement of position and momentum of a microscopic object of mass m are equal, then the uncertainty in the measurement of velocity is given by the expression

(A) $\sqrt{\frac{h}{4\pi m}}$
(B) $\sqrt{\frac{h}{4\pi}} \times \frac{1}{m}$
(C) $\frac{h}{4\pi} \times \sqrt{\frac{1}{m}}$
(D) $\sqrt{\frac{h}{2\pi m}}$

Answer: (B) $\sqrt{\frac{h}{4\pi}} \times \frac{1}{m}$ · The council's preliminary key

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Q293 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

When a metal surface is exposed to certain frequency of electromagnetic radiation, the kinetic energy of electron ejected from metal surface is 0.20eV. If its work function (W_0) is 4.80eV, the approximate frequency of radiation falling on the metal surface in Hz is

(A) 1.98×10^{15}
(B) 1.21×10^{16}
(C) 1.21×10^{15}
(D) 1.98×10^{16}

Answer: (C) 1.21×10^{15} · The council's preliminary key

Q294 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

If the ratio of energies of electron in the excited states of H and Li^{2+} is 1 : 9, the radius ratio of electron in the same excited states of H and Li^{2+} is

(A) 9:1
(B) 3:1
(C) 1:9
(D) 1:3

Answer: (B) 3:1 · The council's preliminary key

Q295 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

If the radius of electron orbit in the excited state of hydrogen atom is $476.1\ \text{pm}$, the energy of electron in that excited state in J is
(Radius and energy of electron in the first orbit of hydrogen atom are $52.9\ \text{pm}$ and $-2.18 \times 10^{-18}\ \text{J}$ respectively)

(A) -2.42×10^{-18}
(B) -19.62×10^{-18}
(C) -2.42×10^{-19}
(D) -6.05×10^{-19}

Answer: (C) -2.42×10^{-19} · The council's preliminary key

Q296 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

A light of frequency $1.6 \times 10^{16}\ \text{Hz}$ when falls on a metal plate emits electrons that have double the kinetic energy compared to the kinetic energy of emitted electrons when frequency of $1.0 \times 10^{16}\ \text{Hz}$ falls on the same plate. The threshold frequency (ν_0) of the metal in Hz is

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(A) 1×10^{15}
(B) 4×10^{15}
(C) 3×10^{15}
(D) 4×10^{13}

Answer: (B) 4×10^{15} · The council's preliminary key

Q297 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

The wavelength corresponding to electronic transition between two orbits of hydrogen atom is 912Å. The wavelength (in Å) for the same electronic transition in Li^{2+} is

(A) 101.3
(B) 202.6
(C) 303.9
(D) 50.65

Answer: (A) 101.3 · The council's preliminary key

Q298 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

The ratio of lowest energy in terms of wave numbers of Balmer and Lyman series of lines of atomic spectrum of hydrogen is

(A) $5 : 27$
(B) $27 : 5$
(C) $20 : 27$
(D) $27 : 2$

Answer: (A) $5 : 27$ · The council's preliminary key

Q299 TS EAMCET 2017 · 12 May · Offline MCQ

Which of the following corresponds to the energy of the possible excited state of hydrogen?

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

Answer: (C) -3.4 eV · The council's preliminary key

Q300 TS EAMCET 2017 · 12 May · Offline MCQ

How many emission spectral lines are possible when hydrogen atom is excited to n^{th} energy level?

(A) $\frac{n(n+1)}{2}$

(B) $\frac{(n+1)}{2}$

(C) $\frac{(n-1)n}{2}$

(D) $\frac{n^2}{4}$

Answer: (C) $\frac{(n-1)n}{2}$ · The council's preliminary key

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Q301 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

The energy and radius of electron present in second orbit of He^+ respectively are

(A) $-2.18 \times 10^{-18}\ J,\ 105.8\ pm$

(B) $-4.36 \times 10^{-18}\ J,\ 52.9\ pm$

(C) $-1.09 \times 10^{-18}\ J,\ 105.8\ pm$

(D) $-8.72 \times 10^{-18}\ J,\ 211.6\ pm$

Answer: (A) $-2.18 \times 10^{-18}\ J,\ 105.8\ pm$ · The council's preliminary key

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Q302 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

The work functions of Ag, Mg, K and Na respectively in eV are 4.3, 3.7, 2.25, 2.30. When an electromagnetic radiation of wavelength of 300 nm is allowed to fall on these metal surfaces, the number of metals from which the electrons are ejected is :
($1\ eV = 1.6022 \times 10^{-19}\ J$)

(A) 5

(B) 4

(C) 3

(D) 2

Answer: (C) 3 · The council's preliminary key

Q303 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

If the radius of electron in the excited state of He^+ is 0.4232 nm, the energy of electron in that excited state in J is :
(The radius and energy of electron in the first orbit of hydrogen atom are 52.9 pm and -2.18×10^{-18} J respectively)

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(A) -5.45×10^{-17}
(B) -5.45×10^{-19}
(C) 5.45×10^{18}
(D) 5.45×10^{-18}

Answer: (B) -5.45×10^{-19} · The council's preliminary key

Q304 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

The wavelength (in m) of a particle of mass 1.67×10^{-27} kg moving with velocity $3.97 \times 10^{6}\ \mathrm{m\,s^{-1}}$ is :

(A) 1×10^{-13}
(B) 1×10^{-11}
(C) 2×10^{-13}
(D) 2×10^{-11}

Answer: (A) 1×10^{-13} · The council's preliminary key

Q305 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

The ground state energy of H is equal to

(A) First excited state energy of $\mathrm{He^{+}}$
(B) Ground state energy of $\mathrm{Be^{3+}}$
(C) First excited state energy of $\mathrm{Li^{2+}}$
(D) Ground state energy of $\mathrm{Li^{2+}}$

Answer: (A) First excited state energy of $\mathrm{He^{+}}$ · The council's preliminary key

Q306 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

Identify the correct statements:
a) In an atom, the possible maximum number of electrons with $n = 4$ and $m_s = +\frac{1}{2}$ is 16
b) There are 4 sub shells associated with $n = 5$
c) $n = 2$, $l = 1$, $m_l = 0$ and $m_s = -\frac{1}{2}$ is a possible set of quantum numbers
d) The number of radial nodes for 3s orbital is 2

(A) a, b, c
(B) a, c
(C) a, c, d
(D) a, b, d

Answer: (C) a, c, d · The council's preliminary key

Q307 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

If the wave number of radiation emitted for the electron transition from an excited state to the first excited state of hydrogen is $\frac{5x}{36}\ \mathrm{m^{-1}}$ (x is the Rydberg constant), the wave number of radiation

absorbed for the electron transition from the above excited state to next immediate excited state in m^{-1} is:

(A) $\frac{7x}{144}$
(B) $\frac{21x}{100}$
(C) $\frac{16x}{225}$
(D) $\frac{5x}{36}$

Answer: (A) $\frac{7x}{144}$ · The council's preliminary key

Q308 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

If the de Broglie wavelength of electron is 728.14 nm, its kinetic energy in J [is] (mass of electron $=$ 9.1×10^{-31} kg; h $= 6.626 \times 10^{-34}$ J s)

(A) 4.55×10^{-25}
(B) 9.1×10^{-25}
(C) 4.55×10^{-23}
(D) 9.1×10^{-23}

Answer: (A) 4.55×10^{-25} · The council's preliminary key

Q309 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

The ground and first excited state energies are E_1 and E_2 respectively. Which pair of species has same energy? [Note that energy is indicated in the bracket].

(A) $H(E_1),\ Li^{2+}(E_2)$
(B) $He^{+}(E_1),\ Be^{3+}(E_2)$
(C) $He^{+}(E_1),\ Li^{2+}(E_2)$
(D) $H(E_2),\ Be^{3+}(E_1)$

Answer: (B) $He^{+}(E_1),\ Be^{3+}(E_2)$ · The council's preliminary key

Q310 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

The kinetic energy (in J) of a particle of mass 4.5×10^{-31} kg having a wavelength of 1000 nm is : ($h = 6.62 \times 10^{-34}$ J s)

(A) 2.43×10^{-24}
(B) 2.43×10^{-26}
(C) 4.86×10^{-24}
(D) 4.86×10^{-25}

Answer: (D) 4.86×10^{-25} · The council's preliminary key

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Q311 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

If the frequency of radiation emitted for the electron transition from an excited state to ground state of hydrogen atom is $\frac{3X}{4}$ Hz, the frequency of radiation absorbed for the electron transition from the above excited state to next immediate excited state in Hz is:

(A) $\frac{8X}{9}$
(B) $\frac{21X}{100}$
(C) $\frac{3X}{4}$
(D) $\frac{5X}{36}$

Answer: (D) $\frac{5X}{36}$ · The council's preliminary key

Q312 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

If the kinetic energy of electron is 18.2×10^{-25} J, its de Broglie wavelength in nm is : (mass of electron $= 9.1 \times 10^{-31}$ kg; h $= 6.626 \times 10^{-34}$ J s)

(A) 182
(B) 728
(C) 364
(D) 1092

Answer: (C) 364 · The council's preliminary key

Q313 TS EAMCET 2016 · 15 May · Offline MCQ

Assertion (A) : Atoms with completely filled and half filled subshells are stable.
Reason (R) : Completely filled and half filled subshells have symmetrical distribution of electrons and have maximum exchange energy.
The correct answer is

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

Answer: (A) (A) and (R) are correct, (R) is the correct explanation of (A) · Official TGCHE final key

Q314 TS EAMCET 2016 · 15 May · Offline MCQ

The element with the electronic configuration $1s^2\,2s^2\,2p^6\,3s^2\,3p^6\,3d^{10}\,4s^1$ is

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(A) Cu
(B) Ca
(C) Cr
(D) Co

Answer: (A) Cu · Official TGCHE final key

Q315 TS EAMCET 2016 · 15 May · Offline MCQ

Among the following, the isoelectronic species is/are
(i) $O^{2-}, F^{-}, Na^{+}, Mg^{2+}$
(ii) $Na^{+}, Mg^{+}, Al^{3+}, F^{-}$
(iii) $N^{3-}, O^{2-}, F^{-}, Ne$

(A) (i) & (ii)
(B) (i), (ii) & (iii)
(C) (ii) & (iii)
(D) (i) & (iii)

Answer: (D) (i) & (iii) · Official TGCHE final key

Q316 AP EAMCET 2016 · 29 Apr · Offline MCQ

In which of the following, the product of uncertainty in velocity and uncertainty in position of a micro particle of mass 'm' is not less than

(A) $h \times \frac{3\pi}{m}$
(B) $\frac{h}{3\pi} \times m$
(C) $\frac{h}{4\pi} \times \frac{1}{m}$
(D) $\frac{h}{4\pi} \times m$

Answer: (C) $\frac{h}{4\pi} \times \frac{1}{m}$ · The council's preliminary key

Q317 AP EAMCET 2014 · 22 May · Offline MCQ

In an atom the order of increasing energy of electrons with quantum numbers (i) $n = 4, l = 1$ (ii) $n = 4, l = 0$ (iii) $n = 3, l = 2$ and (iv) $n = 3, l = 1$ is

(A) (iii) < (i) < (iv) < (ii)
(B) (ii) < (iv) < (i) < (iii)
(C) (i) < (iii) < (ii) < (iv)
(D) (iv) < (ii) < (iii) < (i)

Answer: (D) (iv) < (ii) < (iii) < (i) · The council's preliminary key

Q318 AP EAMCET 2014 · 22 May · Offline MCQ

The number of angular and radial nodes of 4d orbital respectively are

(A) 3, 1
(B) 1, 2
(C) 3, 0
(D) 2, 1

Answer: (D) 2, 1 · The council's preliminary key

Q319 AP EAMCET 2013 · 10 May · Offline MCQ

The number of radial nodes of 3s and 2p orbitals respectively are :

(A) 0, 2
(B) 2, 0
(C) 1, 2
(D) 2, 1

Answer: (B) 2, 0 · The council's preliminary key

Q320 AP EAMCET 2013 · 10 May · Offline MCQ

The basis of quantum mechanical model of an atom is :

(A) angular momentum of electron
(B) quantum numbers
(C) dual nature of electron
(D) black body radiation

Answer: (C) dual nature of electron · The council's preliminary key

Q321 AP EAMCET 2012 · 12 May · Offline MCQ

The quantum number which explains the line spectra observed as doublets in case of hydrogen and alkali metals and doublets and triplets in case of alkaline earth metals is

(A) Spin
(B) Azimuthal
(C) Magnetic
(D) Principal

Answer: (A) Spin · Official APSCHE final key

Q322 AP EAMCET 2011 · 8 May · Offline MCQ

The number of radial nodes present in the radial probability distribution curves for the orbital wave function with quantum numbers $n = 4$, $l = 0$ and $m = 0$ is :

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

Answer: (B) 3 · The council's preliminary key

Q323 AP EAMCET 2011 · 8 May · Offline MCQ

If the uncertainty in velocities of two particles A and B with mass 1.0×10^{-27} kg and 1.0×10^{-31} kg respectively is the same, the ratio of uncertainty in the positions of A and B is :

(A) 1000 : 1
(B) 10,000 : 1
(C) 1 : 1000
(D) 1 : 10,000

Answer: (D) 1 : 10,000 · The council's preliminary key

Q324 AP EAMCET 2010 · 30 May · Offline MCQ

Which one of the following transitions of an electron in hydrogen atom emits radiation of the lowest wavelength ?

(A) $n_2 = \infty$ to $n_1 = 2$
(B) $n_2 = 4$ to $n_1 = 3$
(C) $n_2 = 2$ to $n_1 = 1$
(D) $n_2 = 5$ to $n_1 = 3$

Answer: (C) $n_2 = 2$ to $n_1 = 1$ · Official APSCHE final key

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Q325 AP EAMCET 2010 · 30 May · Offline MCQ

Which one of the following conditions is incorrect for a well behaved wave function (ψ) ?

(A) ψ must be finite
(B) ψ must be single valued
(C) ψ must be infinite
(D) ψ must be continuous

Answer: (C) ψ must be infinite · Official APSCHE final key

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