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NEET STRUCTURE OF ATOM — BOHR MODEL FOR HYDROGEN ATOM — PYQS

Max. Marks: 28 **Questions:** 7

Section A (MCQ) — 7 questions

Q.1 Energy and radius of first Bohr orbit of He^+ and Li^{2+} are [Given $R_H = 2.18 \times 10^{-18}$ J, $a_0 = 52.9$ pm] [NEET (UG) 2025]

(1) $E_n(Li^{2+}) = -19.62 \times 10^{-16}$ J; $r_n(Li^{2+}) = 17.6$ pm $E_n(He^+) = -8.72 \times 10^{-16}$ J; $r_n(He^+) = 26.4$ pm

(2) $E_n(Li^{2+}) = -8.72 \times 10^{-16}$ J; $r_n(Li^{2+}) = 17.6$ pm $E_n(He^+) = -19.62 \times 10^{-16}$ J; $r_n(He^+) = 17.6$ pm

(3) $E_n(Li^{2+}) = -19.62 \times 10^{-18}$ J; $r_n(Li^{2+}) = 17.6$ pm $E_n(He^+) = -8.72 \times 10^{-18}$ J; $r_n(He^+) = 26.4$ pm

(4) $E_n(Li^{2+}) = -8.72 \times 10^{-18}$ J; $r_n(Li^{2+}) = 26.4$ pm $E_n(He^+) = -19.62 \times 10^{-18}$ J; $r_n(He^+) = 17.6$ pm

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Q.2 The energy of an electron in the ground state (n = 1) for He^+ ion is −x J, then that for an electron in (n = 2) state for Be^{3+} ion in J is [NEET (UG) 2024]

(1) −x (2) $-\frac{x}{9}$ (3) −4x (4) $-\frac{4}{9}x$

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Q.3 If radius of second Bohr orbit of the He^+ ion is 105.8 pm, what is the radius of third Bohr orbit of Li^{2+} ion? [NEET (UG) 2022]

(1) 158.7 pm (2) 15.87 pm

(3) 1.587 pm (4) 158.7 Å

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Q.4 Based on equation $E = -2.178 \times 10^{-18}\ J\left(\frac{Z^2}{n^2}\right)$, certain conclusions are written. Which of them is not correct ? [NEET 2013]

(1) Equation can be used to calculate the change in energy when the electron changes orbit.

(2) For n = 1, the electron has a more negative energy than it does for n = 6 which means that the electron is more loosely bound in the smallest allowed orbit.

(3) The negative sign in equation simply means that the energy of electron bound to the nucleus is lower than it would be if the electrons were at the infinite distance from the nucleus.

(4) Larger the value of n, the larger is the orbit radius.

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Q.5 The energy of second Bohr orbit of the hydrogen atom is −328 kJ mol^{-1}; hence the energy of fourth Bohr orbit would be [AIPMT 2005]

(1) −41 kJ mol^{-1} (2) −82 kJ mol^{-1}

(3) −164 kJ mol^{-1} (4) −1312 kJ mol^{-1}

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Q.6 The frequency of radiation emitted when the electron falls from n = 4 to n = 1 in hydrogen atom will be (Given ionization energy of H = 2.18×10^{-18} J $atom^{-1}$ and h = 6.625×10^{-34} J s) [AIPMT 2004]

(1) $1.54 \times 10^{15}\ s^{-1}$ (2) $1.03 \times 10^{15}\ s^{-1}$

(3) $3.08 \times 10^{15}\ s^{-1}$ (4) $2.00 \times 10^{15}\ s^{-1}$

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Q.7 In hydrogen atom, energy of first excited state is −3.4 eV. Then find out K.E. of same orbit of hydrogen atom [AIPMT 2002]

(1) +3.4 eV (2) +6.8 eV

(3) −13.6 eV (4) +13.6 eV

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ANSWER KEY

Ques.	1	2	3	4	5	6	7				
Ans.	**3**	**1**	**1**	**2**	**2**	**3**	**1**				