

JEE MAIN STRUCTURE OF ATOM — BOHR MODEL FOR HYDROGEN ATOM — PYQS

Max. Marks: 32

Questions: 8

Section A (MCQ) — 7 questions

Q.1 The Bohr radius of a hydrogen like species is 70.53 pm. The species and the stationary state (n) are respectively

(Given : Hydrogen atom Bohr radius is 52.9 pm)

[JEE Main 2026 (Online) 6th April Evening Shift]

- (1) Li^{2+} , 3 (2) He^+ , 3 (3) He^+ , 2 (4) Li^{2+} , 2

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Q.2 The species having identical radii according to the Bohr's theory are :

- A. H (first orbit) B. He^+ (first orbit)
C. He^+ (Second orbit) D. Li^{2+} (first orbit)
E. Be^{3+} (Second orbit)

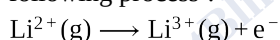
Choose the correct answer from the options given below : [JEE Main 2026 (Online) 4th April Evening Shift]

- (1) A and C Only (2) A and E Only
(3) B and E Only (4) C and D Only

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Q.3 What is the energy (in J atom^{-1}) required for the following process ?



(Take the ionization energy for the H atom in the ground state as $2.18 \times 10^{-18} \text{ J atom}^{-1}$)

[JEE Main 2026 (Online) 2nd April Morning Shift]

- (1) 8.72×10^{-18} (2) 1.962×10^{-18}
(3) 1.962×10^{-17} (4) 6.54×10^{-17}

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Q.4 Which of the following statements regarding the energy of the stationary state is true in the following one-electron systems ?

[JEE Main 2026 (Online) 23rd January Morning Shift]

- (1) $+2.18 \times 10^{-18} \text{ J}$ for second orbit of He^+ ion
(2) $+8.72 \times 10^{-18} \text{ J}$ for first orbit of He^+ ion
(3) $-1.09 \times 10^{-18} \text{ J}$ for second orbit of H atom.
(4) $-2.18 \times 10^{-18} \text{ J}$ for third orbit of Li^{2+} ion

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Q.5 The energy required by electrons, present in the first Bohr orbit of hydrogen atom to be excited to second Bohr orbit is _____ J mol^{-1} .

Given: $R_H = 2.18 \times 10^{-11} \text{ ergs}$.

[JEE Main 2026 (Online) 22nd January Morning Shift]

- (1) 9.835×10^{12} (2) 1.635×10^{-11}
(3) 1.635×10^{-18} (4) 9.835×10^5

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Q.6 Which of the following postulate of Bohr's model of hydrogen atom is not in agreement with quantum mechanical model of an atom?

[JEE Main 2025 (Online) 3rd April Morning Shift]

- (1) The electron in a H atom's stationary state moves in a circle around the nucleus.
(2) An atom can take only certain distinct energies E_1, E_2, E_3 , etc. These allowed states of constant energy are called the stationary states of atom.
(3) An atom in a stationary state does not emit electromagnetic radiation as long as it stays in the same state.
(4) When an electron makes a transition from a higher energy stationary state to a lower energy stationary state, then it emits a photon of light.

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Q.7 According to Bohr's model of hydrogen atom, which of the following statement is incorrect?

[JEE Main 2025 (Online) 2nd April Morning Shift]

- (1) Radius of 4th orbit is four times larger than that of 2nd orbit
(2) Radius of 8th orbit is four times larger than that of 4th orbit
(3) Radius of 6th orbit is three times larger than that of 4th orbit
(4) Radius of 3rd orbit is nine times larger than that of 1st orbit

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Section B (Numerical) — 1 question

Q.8 The energy of an electron in the first Bohr orbit of the H-atom is -13.6 eV.

The magnitude of energy value of an electron in the first excited state of Be^{3+} is _____ eV (nearest integer value).

[JEE Main 2025 (Online) 8th April Evening Shift]

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**ANSWER KEY****Section A (MCQ) — 7 questions**

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

Section B (Numerical) — 1 question

Ques.	8										
Ans.	54										