Chapter 12

Atom models

Exercise

Q.2The velocity of an electron in 2^{nd} orbit of double ionized sodium atom $(Z = 11)$ is v. The velocity of an electron in its fifth orbit will be (A)V(B) $\frac{5}{2}v$ (C) $\frac{2}{5}v$ (D) $\frac{22}{5}v$ Q.3The difference in angular momentum associated with the electron in the two successive orbits of a hydrogen atom is: (A) $\frac{h}{\pi}$ (B) $\frac{2h}{\pi}$ (C) $\frac{nh}{2\pi}$ (D) $\frac{h}{2\pi}$ Q.4In Rutherford scattering experiment, what will be scattering angle for αn a particle for animpact parameter b= 0? (A) 180°(B) 90°(C) 270°(D)0°Q.5The ratio of magnitude of energies of electron in first and second excited states of hydrogen atom is: (A) 11: 4(B) 4: 9(C) 9: 4(D) 4:Q.6How many times does the electron of hydrogen atom go around the first Bohr orbitin one second? [m = 9.1 × 10^{-31} kg, e = 1.6 × 10^{-19} C c 0 = 8.85 × 10^{-12} F m^{-1}, h = 6.6 × 10^{-34} J s] (A) 6.6 × 10^5(B) 6.6 × 10^{10}(C) 6.6 × 10^{13}(D) 6.6 × 10^{15}Q.7Determine the ratio of perimeter of 2 nd and 3 rd Bohr orbit in He+ atom (Z = 2). (A) $\frac{9}{4}$ (B) $\frac{9}{16}$ (C) $\frac{4}{9}$ (D) $\frac{16}{9}$ Q.8A hydrogen atom and a Li++ ion are both in the second excited state. If IH. And Iliare their respective electronic angular momenta, and EH and EIi their respective energies, then (A) L _H = L _H and E _H < [E _H] (C) L _H = L _H and E _H < [E _H] (C) L _H = L _H and E _H < [E _H] (C) L _H = L _H and E _H < [E _H] (C) L _H = L _H and E _H < [E _H] (C) L _H = L _H and E _H < [E _H] (C) L _H = L _H and E _H < [E _H] (C) L _H = L _H and E _H < [E _H] (C) L _H = L _H and E _H < [E _H] (C) L _H = L _H and E _H < [E _H] (C) L _H = L _H and E _H < [E _H] (C) L _H	Q.1	 What is the plum pudding model of the atom? (A)An atom is a ball of positive charge with negative electrons embedded in it. (B)An atom is a ball of negative charge with positive electrons embedded in it. (C) An atom is a ball of positive charge with negative neutrons embedded in it. (D)An atom is a ball of negative charge with negative neutrons embedded in it. 										
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Q.9 The given diagram indicates the energy levels of a certain atom. When the system moves from 2*E* level to *E* level, a photon of wavelength λ is emitted. The wavelength of the photon emitted during its transition from $\frac{E4}{2}$ level to *E* level is.



Q.10 An energy of **24.6eV** is required to remove one of the electrons from the ground state of aneutral helium atom. The energy (in eV) required to remove both the electrons from the ground state of a neutral helium atom is

(A)79.0 e V (B)51.8 e V (C) 49.2 e V (D)38.2 eV

ANSWER KEY

Q.	1	2	3	4	5	6	7	8	9	10
Sol.	(A)	(C)	(D)	(D)	(C)	(D)	(C)	(B)	(D)	(A)