SHAHEEN GROUP OF INSTITUTIONS
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Class : NEET Repeaters Sub: Physics Worksheet–28 Date: 20-02-2019

Atoms

1. Find the ratio of equivalents current due to electron motion in first and second orbits of hydrogen atom.
   (A) 1 : 2 (B) 2 : 1 (C) 1 : 8 (D) 8 : 1

2. If minimum wavelength obtained in a X-ray tube is 2.5×10^{-10}m. For this minimum wavelength the minimum operating voltage of the tube should be
   (A) 2 kV (B) 3 kV (C) 4 kV (D) 5 kV

3. What is the wavelength of the least energetic photon emitted in the Lyman series of the hydrogen atom spectrum?
   (A) 150 nm (B) 122 nm (C) 102 nm (D) 82 nm

4. What is the ratio of the shortest wavelength of the Balmer series to the shortest wavelength of the Lyman series?
   (A) 4 : 1 (B) 4 : 3 (C) 4 : 9 (D) 5 : 9

5. According to Bohr model for hydrogen, energy is proportional to :
   (A) $-Z^2 / n$ (B) $\frac{-n}{Z}$ (C) $\frac{-z^2}{n^2}$ (D) $\frac{-n^2}{z}$

6. If ionization potential of hydrogen atom is 13.6V then what is ionization potential of He atom?
   (A) 27.6 V (B) 13.6 V (C) 54.4 V (D) None

7. Which of the following statements is correct?
   (A) Lyman series is continuous.
   (B) Balmer series lies in ultraviolet region.
   (C) Paschen series lies in infrared region.
   (D) Brackett series lies in visible region.

8. According to the Bohr theory of hydrogen atom, the speed of the electron, its energy and the radius of its orbit varies with the principal quantum number n, respectively, as
   (A) $\frac{1}{n}, \frac{1}{n^2}, n^2$ (B) $\frac{1}{n}, n^2 \frac{1}{n^2}$ (C) $n^2, \frac{1}{n^2}, n^2$ (D) $n \frac{1}{n^2}, \frac{1}{n^2}$

9. The ionization energy of the electron in the hydrogen atom in its ground state is 13.6 eV. The atoms are excited to higher energy levels to emit radiations of 6 wavelengths. Maximum wavelength of emitted radiation corresponds to the transition between
   (A) n = 4 to n = 3 states (B) n = 3 to n = 2 states
   (C) n = 3 to n = 1 states (D) n = 2 to n = 1 states

10. In a Rutherford scattering experiment when a projectile of charge z_1 and mass M_1 approaches a target nucleus of charge z_2 and mass M_2, the distance of closest approach is r_0. The energy of the projectile is
(A) directly proportional to mass M.
(B) directly proportional to $M_1 M_2$.
(C) directly proportional to $z_1 z_2$.
(D) inversely proportional to $z_1 A$.

11. The wavelength of the first line of Lyman series for hydrogen atom is equal to that of the second line of Balmer series for a hydrogen like ion. The atomic number Z of hydrogen like ion is
(A) 3 (B) 4 (C) 1 (D) 2

12. An electron of stationary hydrogen atom passes from the fifth energy level to the ground level. The velocity that the atom acquired a result of photon emission will be
(A) $\frac{25m}{24hR}$ (B) $\frac{24}{25hR}$ (C) $\frac{24hR}{25m}$ (D) $\frac{25hR}{24}$

13. The transition from the state n=3 to n=1 in a hydrogen like atom results in ultraviolet radiation. Infrared radiation will be obtained in the transition from
(A) $4 \rightarrow 2$ (B) $4 \rightarrow 3$ (C) $2 \rightarrow 1$ (D) $3 \rightarrow 2$

14. Energy levels A, B and C of a certain atom correspond to increasing values of energy i.e. $E_A < E_B < E_C$. If λ_1, λ_2 and λ_3 are wave lengths of radiations corresponding to transitions C to B, B to A and C to A respectively, which of the following relations is correct
(A) $\lambda_3 = \lambda_1 + \lambda_2$ (B) $\lambda_3 = \frac{\lambda_1 \lambda_2}{\lambda_1 + \lambda_2}$
(C) $\lambda_1 + \lambda_2 + \lambda_3 = 0$ (D) $\lambda_2^3 = \lambda_1^2 + \lambda_2^2$

15. If electron in a hydrogen atom has moved from n=1 to n=10 orbit, the potential energy of the system has
(A) increased (B) decreased
(C) remained unchanged (D) become zero

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1-D	2-D	3-B	4-A	5-C	6-C	7-C	8-A	9-A	10-C	11-C	12-C	13-B	14-B	15-A