

Q1. 21 January Shift 1

If an alpha particle with energy 7.7 MeV is bombarded on a thin gold foil, the closest distance from nucleus it can reach is ____ m. (Atomic number of gold = 79 and $\frac{1}{4\pi\epsilon_0} = 9 \times 10^9$ in SI units)

- (1) 3.85×10^{-16} (2) 3.85×10^{-14} (3) 2.95×10^{-16} (4) 2.95×10^{-14}

Q2. 21 January Shift 2

The energy of an electron in an orbit of the Bohr's atom is $-0.04E_0$ eV where E_0 is the ground state energy. If L is the angular momentum of the electron in this orbit and h is the Planck's constant, then $\frac{2\pi L}{h}$ is ____ :

- (1) 5 (2) 6 (3) 2 (4) 4

Q3. 22 January Shift 2

The smallest wavelength of Lyman series is 91 nm. The difference between the largest wavelengths of Paschen and Balmer series is nearly ____ nm.

- (1) 1550 (2) 1217 (3) 1875 (4) 1784

Q4. 23 January Shift 1

In hydrogen atom spectrum, ($R \rightarrow$ Rydberg's constant) A. the maximum wavelength of the radiation of Lyman series is $\frac{4}{3R}$ B. the Balmer series lies in the visible region of the spectrum C. the minimum wavelength of the radiation of Paschen series is $\frac{9}{R}$ D. the minimum wavelength of Lyman series is $\frac{5}{4R}$ Choose the correct answer from the options given below :

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

Q5. 24 January Shift 1

Two electrons are moving in orbits of two hydrogen like atoms with speeds 3×10^5 m/s and 2.5×10^5 m/s respectively. If the radii of these orbits are nearly same then the possible order of energy states are ____ respectively.

- (1) 8 and 10 (2) 9 and 8 (3) 10 and 12 (4) 6 and 5

ANSWER KEYS

1. (4) 2. (1) 3. (2) 4. (3) 5. (4)