

Atomic Structure

1. The Bohr's model of atoms
 - (a) Assumes that the angular momentum of electrons is quantized
 - (b) Uses Einstein's photo-electric equation
 - (c) Predicts continuous emission spectra for atoms
 - (d) Predicts the same emission spectra for all types of atoms
2. In an orbital motion, the angular momentum vector is
 - (a) Along the radius vector
 - (b) Parallel to the linear momentum
 - (c) In the orbital plane
 - (d) Perpendicular to the orbital plane
3. The colour of the second line of Balmer series is
 - (a) Blue
 - (b) Yellow
 - (c) Red
 - (d) Violet
4. If the ionization energy for the hydrogen atom is 13.6 eV, the energy required to excite it from the ground state to the next higher state is nearly
 - (a) 3.4 eV
 - (b) 10.2 eV
 - (c) 12.1 eV
 - (d) 1.5 eV
5. The total energy of the electron in the hydrogen atom in the ground state is -13.6 eV. The kinetic energy of this electron is
 - (a) -13.6 eV
 - (b) 0
 - (c) 6.8 eV
 - (d) 13.6 eV
6. What change in energy per mole of atoms will be associated with an atomic transition giving rise to radiation at 1 Hz
 - (a) $0.399 \times 10^{-10} \text{ J mol}^{-1}$
 - (b) $9.390 \times 10^{-10} \text{ J mol}^{-1}$
 - (c) $3.990 \times 10^{-10} \text{ J mol}^{-1}$
 - (d) None of these
7. According to Bohr's theory the radius of electron orbit is proportional to
 - (a) $Z^2 n^2$
 - (b) $\frac{Z^2}{n^2}$
 - (c) $\frac{Z^2}{n}$
 - (d) $\frac{n^2}{Z}$
8. According to Bohr's postulate which of the following take discrete values
 - (a) Kinetic energy
 - (b) Potential energy
 - (c) Angular momentum
 - (d) Linear momentum
9. When an electron jumps from the fourth orbit to the second orbit, one gets the
 - (a) Second line of Lyman series
 - (b) Second line of Paschen series
 - (c) Second line of Balmer series
 - (d) First line of Pfund series
10. Calculate the series limit of the Lyman series of hydrogen atom
 - (a) $9.1176 \times 10^{-6} \text{ cm}$
 - (b) 10968 cm
 - (c) $1.2157 \times 10^{-5} \text{ cm}$
 - (d) 82259 cm
11. Which of the following phenomena suggests the presence of electron energy levels in atoms
 - (a) Radio active decay
 - (b) Isotopes
 - (c) Spectral lines
 - (d) α -particles scattering
12. The ionisation potential of H-atom is 13.6 V when it is excited from ground state by monochromatic radiations of 970.6 Å, the number of emission lines will be (according to Bohr's theory)
 - (a) 10
 - (b) 8
 - (c) 6
 - (d) 4
13. A hydrogen atom moving with velocity 4m/s absorbs a photon of wavelength λ and stops. The value of λ will be
 - (a) 1000 Å
 - (b) 2000 Å
 - (c) 3000 Å
 - (d) 4000 Å
14. A hydrogen atom moving with velocity u collides inelastically with another hydrogen atom at rest. Both the atoms are in the ground state before collision. The minimum value of u , so that one of the atoms get excited, will be
 - (a) $3.12 \times 10^6 \text{ m/s}$
 - (b) $9.36 \times 10^5 \text{ m/s}$
 - (c) $6.24 \times 10^4 \text{ m/s}$
 - (d) $5 \times 10^3 \text{ m/s}$
15. The angular momentum of electron in hydrogen atom is proportional to
 - (a) \sqrt{r}
 - (b) $1/r$
 - (c) r^2
 - (d) $1/\sqrt{r}$