Time: 2 hours | Chemistry| NEET | Marks: 50

(Atomic Structure)

NAME OF THE STUDENT:-_____ DATE:-

INSTRUCTION – ATTEMPT ALL QUESTIONS

Q.1. The measurement of the electron position is associated with an uncertainty in momentum, which is equal to 1×10^{-18} g cm s^{-1}. The uncertainty in electron velocity is (mass of an electron is 9×10^{-28} g)

(a) 1×10^{5} cm s^{-1} (b) 1×10^{11} cm s^{-1} (c) 1×10^{9} cm s^{-1} (d) 1×10^{6} cm s^{-1}

Q.2. Consider the following sets of quantum numbers :

	n	l	m	s
I.	3	0	0	+1/2
II.	2	2	1	+1/2
III.	4	3	-2	-1/2
IV.	1	0	-1	-1/2
V.	3	2	3	+1/2

Which of the following sets of quantum number is not possible?

(a) (i), (ii), (iii) and (iv) (b) (ii), (iv) and (v) (c) (i) and (iii) (d) (ii) ,(iii) and (iv)

Q.3. The orientation of an atomic orbital is governed by

(a) principal quantum number (b) azimuthal quantum number

(c) spin quantum number (d) magnetic quantum number.

Q.4. Given The mass of electron is 9.11×10^{-31} kg, Planck constant is 6.626×10^{-34} J s, the uncertainty involved in the measurement of velocity within a distance of 0.1 A is

(a) 5.79×10^{5} ms^{-1} (b) 5.79×10^{6} m s^{-1} (c) 5.79×10^{7} m s^{-1} (d) 5.79×10^{8} m s^{-1}

Q.5. The energy of second Bohr orbit of the hydrogen atom is -328 kJ mol^{-1}; hence the energy of fourth Bohr orbit would be

(a) - 41 kJ mol^{-1} (b) -82 kJ mol^{-1} (c) -164 kJ mol^{-1} (d) -1312 kJ mol^{-1}

Q.6. The frequency of radiation emitted when the electron falls from n = 4 to n = 1 in a hydrogen atom will be (Given ionization energy of H=2.18 x 10^{-18} J atom and h=6.625 x 10^{-34} J s)

(a) 1.54 x 10^{15} s^{-1} (b) 1.03 x 10^{15} s^{-1} (c) 3.08 x 10^{15} s^{-1} (d) 2.00 × 10^{15} s^{-1}

Q.7. The value of Planck's constant is 6.63 × 10^{-34} J s. The velocity of light is 3.0 x 10^{8} m s^{-1}. Which value is closest to the wavelength in nanometers of a quantum of light with frequency of 8 x 10^{15} s^{-1}?

(a) 2 × 10^{-25} (b) 5 x 10^{-18} (c) 4 x 10^{1} (d) 3 × 10^{7}

Q.8. In hydrogen atom, energy of first excited state is -3.4 eV. Then find out K.E. of same orbit. of hydrogen atom

(a) +3.4 eV (b) +6.8 eV (c) -13.6 eV (d)+13.6 eV

Q.9. Main axis of a diatomic molecule is z, molecular orbital p_x and p_y overlap to form which of the following orbitals.

(a) π molecular orbital (b) σ molecular orbital

(c) δ molecular orbital (d) No bond will form

Q.10. The following quantum number are possible for how many orbitals n = 3, l =2, m = +2?

(a) 1 (b) 2 (c) 3 (d) 4

Q.11. For given energy, E = 3.03 × 10^{-19} Joules corresponding wavelength is

(h = 6.626 × 10^{-34} J sec, c = 3 × 10^{8} m/sec)

(a) 65.5 nm (b) 6.56 nm (c) 3.4 nm (d) 656 nm

Q.12. Isoelectronic species are

(a) CO, CN^- ,NO^+ , C_2^{2-} (b) CO^-, CN, NO, C_2^-

(c) CO^+, CN^+, NO^-, C_2 (d) CO, CN, CO, C_2

Q.13. The uncertainty in momentum of an electron is 1 × 10^{-5} kg m/s. The uncertainty in its position will be (h = 6.62 × 10^{-34} kg m^2/s)

(a) 5.27 × 10^{-30} m (b) 1.05 × 10^{-26} m (c) 1.05 × 10^{-28} m (d) 5.25 × 10^{-28}m

Q.14. Who modified Bohr's theory by introducing elliptical orbits for electron path?

(a) Rutherford (b) Thomson (c) Hund (d) Sommerfield

Q.15. The de Broglie wavelength of a particle with mass 1 g and velocity 100 m/s is

(a) 6.63 × 10^{-35} m (b) 6.63 x 10^{-34} m (c) 6.63 x 10^{-33} m (d) 6.65 x 10^{-35}m