**NEET -CHEMISTRY MAX. Marks=180**

**SYLLABUS; STRUCTURE OF ATOM**

**Answer the following questions 45 X 4=180 Marks**

1. **When 4p orbital in any atom is filled completely, the next electron goes in**

(1) 5s (2) 3d

(3) 4d (4) 4f

1. **In a given atom no two electrons can have the same values for all the four quantum numbers. This is called**

(1) Hund's Rule (2) Aufbau principle

(3) Uncertainty principle (4) Pauli's Exclusion principle

1. **Two electrons occupying the same orbital are distinguished by**

(1) azimuthal quantum number (2) spin quantum number

(3) principal quantum number (4) magnetic quantum number

1. **The number of angular and radial nodes in 3p orbital respectively are**

(1) 3, 1 (2) 1, 1

(3) 2, 1 (4) 2, 3

1. **The total number of orbital's possible for principal quantum number n is**

(1) n (2) n2

(3) 2n (4) 2n2

1. **Which sub–shell is not permissible**

(1) 2d (2) 4f

(3) 6p (4) 3s

1. **4s2 is the configuration of the outermost orbit of an element. Its atomic number would be**

(1) 29 (2) 24

(3) 30 (4) 19

1. **The electronic configuration of Pt (atomic number 78) is:**

(1) [Xe] 4f14 5d9 6s1 (2) [Kr] 4f14 5d10

(3) [Xe] 4f14 5d10 (4) [Xe] 4f14 5d8 6s2

1. **If an electron has spin quantum number of +1/2 and a magnetic quantum number of -1, then it cannot be represented in:**

(1) s-orbital (2) p-orbital

(3) d-orbital (4) f-orbital

1. **In hydrogen spectrum, the series of lines appearing in ultra violet region of electromagnetic spectrum are called**

(1) Balmer lines (2) Lyman lines

(3) Pfund lines (4) Brackett lines

1. **According to Aufbau principle, the correct order of energy of 3d, 4s and 4p orbitals is**

(1) 4p < 3d < 4s (2) 4s < 4p < 3d

(3) 4s < 3d < 4p (4) 3d < 4s < 4p

1. **An impossible set of four quantum number of an electron is**

(1) n = 4, l = 2, m = − 2, s = +1/2

(2) n = 4, l = 0, m = 0, s = +1/2

(3) n = 3, l = 2, m = − 3, s = +1/2

(4) n = 5, l = 3, m = 0, s = − ½

1. **In hydrogen atom, which energy level order is not correct:**

(1) 1𝑠 < 2𝑝 (2) 2 𝑝 = 2𝑠

(3) 2 𝑝 > 2𝑠 (4) 2 𝑝 < 3s

1. **Regarding Bohr’s model of atom, true statements are**

**a) velocity of electron∝ 1/ n**

**b) energy of electron∝ −1/n2**

**c) radius of orbit ∝ n2**

(1) a, b, c (2) a, b only

(3) b, c only (4) a, c only

1. **The hydrogen spectrum is a type of spectrum?**

**(**1) Emission (2) Line

(3) Discontinuous (4) All of these

1. **Given below are two statements. One is labelled as Assertion A and the other is labelled as Reason R.**

**Assertion A: Energy of 2s orbital of hydrogen atom is greater than that of 2s orbital of lithium.**

**Reason R: Energies of the orbitals in the same subshell decrease with increase in the atomic number.**

**In the light of the above statements, choose the correct answer from the options given below.**

(1) Both A and R are true and R is the correct explanation of A.

(2) Both A and R are true but R is NOT the correct explanation of A.

(3) A is true but R is false. (4) A is false but R is true.

1. **Total number of nodes (angular and radial) for 5f orbital is**

(1) 2 (2) 0

(3) 4 (4) 1

1. **Which d-orbital has its four lobes along the axes**

(1) d XY (2) d X2-Y2

(3) dZ2 (4) d XZ

1. **The maximum number of electrons in a sub-shell is given by the expression.**

(1) (l+2) (2) (2l+2)

(3) (4l+2) (4) (l+1)

1. **Which of the following properties of a wave is independent of the other?**

(1)Wave number (2) Frequency

(3) Wave length (4) Amplitude

1. **The ratio between the neutrons presents in carbon atom and silicon atom with mass numbers 12 and 28 is**

(1) 7: 3 (2) 3: 7

(3) 1: 2 (4) 2: 1

1. **The isotopes of neutral atoms of an element differ in**

(1) Atomic number (2) Mass number

(3) Number of electrons (4) Chemical properties

1. **All types of electromagnetic radiations possess same**

(1) Wave length (2) Frequency

(3) Energy (4) Velocity when they passed through vacuum

1. **The number of protons, electrons and neutrons in 35Br80 are respectively**

(1) 35, 35, 80 (2) 80, 80, 35

(3) 35, 35, 45 (4) 45, 45, 35

1. **Assertion (A): Atoms with completely filled and half-filled subshells are stable.**

**Reason (R): Completely filled and half-filled subshells have symmetrical distribution of electrons and have maximum exchange energy.**

**The correct answer is**

(1) (A) and (R) are correct, (R) is the correct explanation of (A)

(2) (A) and (R) are correct, (R) is not the correct explanation of (A)

(3) (A) is correct, but (R) is not correct

 (4) (A) is not correct, but (R) is correct

1. **Which one of the following decides the shapes of orbitals in an energy shell?**

(1) Magnetic quantum number (2) Principal quantum number

(3) Azimuthal quantum number (4) Spin quantum number

1. **The orientation of an atomic orbital is governed by**

(1) principal quantum number (2) azimuthal quantum number

(3) spin quantum number (4) magnetic quantum number

1. **Consider the following statements:**

**(A) The principal quantum number ‘n’ is a positive integer with values of ‘n’ = 1, 2, 3,….**

**(B) The azimuthal quantum number ‘I’ For a given ‘n’ (principal quantum number) can have values as ‘l’ = 0, 1, 2, …n**

**(C) Magnetic orbital quantum number ‘mI’ for a particular ‘l’ (azimuthal quantum number) has (2I+1) values.**

**(D) ±1/2 are the two possible orientations of electron spin.**

**(E) For l =5, there will be a total of 9 orbital**

**Which of the above statement are correct?**

(A), (B) and (C) (2) (A), (C), (D) and (E)

(3) (A), (C) and (D) (4) (A), (B), (C) and (D)

1. **With increasing Principal Quantum number, the energy difference between adjacent energy levels in H-atom\_\_\_\_\_\_**

(1) Decreases (2) Increases

(3) remain constant

(4) decreases at low level of 'n' & increases for higher value of 'n'

1. **How many quantum numbers are required to define the electron in an atom?**

(1) 2 (2) 3

(3) 1 (4) 4

1. **The energy of an electron present in Bohr's second orbit of hydrogen atom is:**

(1) – 1312 J atom–1 (2) – 328 kJ mol–1

(3) – 328 J mol–1 (4) – 164 kJ mol–1

1. **An electron is moving in Bohr's fourth orbit. Its de-Broglie wavelength is λ. What is the circumference of the fourth orbit?**

(1) 2/ λ (2) 2λ

(3) 4λ (4) 4/ λ

1. **Match the following**

**List-I List-II**

**(A) mvr = nh/2π (i) Paschen series**

 **(B) Infra-red (ii) Electron total energy**

**(C) λ=h/p (iii) de-Broglie equation**

**(D) –e2/ 2r (iv) Schrodinger equation**

**(v) Bohr’s equation**

**The correct answer is**

**A B C D**

(1) (v) (ii) (iii) (i)

(2) (iii) (ii) (v) (iv)

(3) (v) (i) (iii) (ii)

(4) (iv) (i) (ii) (iii)

1. **Given below are two statements.**

 **Statement-I Bohr's theory accounts for the stability and line spectrum of Li+ ion.**

 **Statement-II Bohr's theory was unable to explain the splitting of spectral lines in the presence of a magnetic field.**

**In the light of the above statements, choose the most appropriate answer from the options given below:**

(1) Both statement I and II are true.

(2) Statement I is false but statement II is true.

(3) Both statements I and II are false.

(4) Statement I is true but statement II is false.

1. **There are six electrons, six protons and six neutrons in an atom of an element. What is the atomic number of the element?**

(1) 6 (2) 12

(3) 18 (4) 24

1. **The number of electrons and neutrons of an element is 18 and 20 respectively. Its mass number is**

(1)37 (2) 17

(3) 38 (4) 22

1. **Which of the following is correct increasing order for the value of e /m?**

(1) e < p < n < α (2) n < p < e < α

(3) n < p < α < e (4) n < α < p < e

1. **Rutherford's experiment on scattering of α particles showed for the first time that the atom has:**

(1)nucleus (2) electron

(3) proton (4) neutron

1. **Match the following**

**List-I List -II**

**A. Chadwick I. Cathode rays**

**B. Rutherford II. Discovery of protons**

**C. Gold stein III. Discovery of neutrons**

**D. J.J. Thomson IV. Nuclear atom model**

**The correct match is**

A B C D

(a) IV I II III

(b) III II IV I

(c) III II I IV

(d) III IV II I

1. **Both the position and exact velocity of an electron in an atom cannot be determined simultaneously and accurately. This is known as**

(1) De Broglie principle

(2) Hamiltonian law

(3) Heisenberg uncertainty principle

(4) Bohr theory of hydrogen atom

1. **The de-Broglie wavelength of a particle with mass 1 kg and velocity 100 m/s is**

(1) 6.6 × 10–33 m (2) 6.6 × 10–36 m

(3) 3.3 × 10+33 m (4) 3.3 × 10–36 m

1. **Spectrum of Li2+ is similar to that of**

(1) H (2) Be

(3) He (4) Ne

1. **Impossible electronic configuration is:**

(1) 1s2, 2s2, 2p2, 3s2 (2) 1s2, 2s2

(3) 1s2, 2s2, 2p6 (4) none of these

1. **How many spectral lines are possible when hydrogen atom is excited to nth energy level?**

(1) n (n+ 1)/2 (2) n (n- 1)/2

(3) (n +1)/2 (4) n2/4

1. **The hydrogen line spectrum provides evidence for the**

(1) Heisenberg Uncertainty principle

(2) Wave like properties of light

(3) Diatomic nature of hydrogen

(4) Quantized nature of atomic energy states