Quantum Mechanical Model of Atom,

Orbitals and Quantum Numbers

1. **Which one of the following conditions incorrect for a well behaved wave function (ψ)? (E-2010)**

1) ψ must be finite
2) ψ must be single valued
3) ψ must be infinite
4) ψ must be continuous

2. **(A): The p-orbital has dumb-bell shape.**

(R): Electron present in p-orbital can have any one of the three values of magnetic quantum numbers (0, +1, –1). (AFMC2004)

The correct answer is

1) Both (A) and (R) are true and (R) is the correct explanation of (A).
2) Both (A) and (R) are true and (R) is not the correct explanation of (A).
3) (A) is true but (R) is not true.
4) (A) is not true but (R) is true.

3. **The maximum number of electrons in a sub-shell is given by the expression. (AIPMT2009)**

1) $2n^2$
2) 2l+1
3) (4l+2)
4) 4/=2

4. **Which of the following set of quantum numbers is incorrect? (AIPMT2009)**

1) n =5, l =3, m = 0, s = +1/2
2) n = 3, l = 2, m = –3, s = + 1/2
3) n = 3, l = 2,m = -2, s =-1/2
4) n =4, l =0, m = 0, s = -1/2

5. **Correct set of four quantum numbers for the unpaired electron of Chlorine atom is (DPMT2009)**

1) 2, 0, 0, +1/2
2) 2, 1, -1, +1/2
3) 3, 1,- 1, +1/2
4) 3, 0, 0, +1/2

6. **Probability of finding electron at the nodal surface is** **(AMUPMT2009)**

1) Unity 2) Low 3) High 4) Zero

7. **Correct set of four quantum numbers for the outermost electron of potassium atom is** **(AMUPMT2009)**

1) 3, 1, 0, 1/2 2) 4, 0, 0, 1/2 3) 3, 0, 0, 1/2 4) 4, 1, 0, 1/2

8. **The set of four quantum numbers n=3, /=0,m=0,s=+1/2 represents the outermost electron of** **(j&k 2009)**

1. Na 2.Cl 3.Cr 4.Rb

9. **For principal quantum number n=4, the possible number of orbitals having l=3 is** **(AFMC2009)**

1. 3 2. 7 3.5 4.9

10. **Which one of the following expressions represents the electron probability function (D)** **(M - 2003)**

1) $4\pi r\ dr\ \psi^2$ 2) $4\pi r^2\ dr\ \psi$ 3) $4\pi r^2\ dr\ \psi^2$ 4) $4\pi r\ dr\ \psi$

KEY

1)3 2) 2 3)3 4)2 5)3 6)4 7)2 8)1 9)2 10)3