

1.1 The orbital angular momentum for an electron revolving in an orbit is given by This momentum from an p-electron will be given by-

 $\begin{array}{ccc} +\frac{1}{2} \cdot \frac{h}{2\pi} & \frac{h}{2\pi} & \sqrt{2} \cdot \frac{4}{2\pi} \\ \text{(a)} & \text{(b)} & \text{zero(c)} & \text{(d)} \\ \text{Ans. d} \end{array}$ 

1.2 What of the following sets of quantum numbers is correct for an electron in 3f orbital?

(a)  $n = 4, l = 3, m = +4, s = \begin{pmatrix} +\frac{1}{2} \\ +\frac{1}{2} \\ +\frac{1}{2} \\ (c) n = 4, l = 3, m = +1, s = \begin{pmatrix} -\frac{1}{2} \\ +\frac{1}{2} \\ -\frac{1}{2} \\ (d) n = 4, l = 4, m = -4, s = \begin{pmatrix} -\frac{1}{2} \\ -$ 

1.3 The subshell having maximum degeneracy-

a) s b) p c) d d) f Ans. d

1.4 For a s-electron, the orbital angular momentum is:  $\sqrt{6}(h/2\pi) - \sqrt{2}(h/2\pi) - (h/2\pi)$ (a) (b) (c) (d) 0 Ans. d

Alls. u

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1.5The number of nodal planes in a s orbital is:(a) One (b) Zero (c) Three (d) FourAns. b
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1.6 Which of the following sub-orbit has the maximum energy? (a) 3s (b) 4s (c) 5p (d) 6s Ans. d

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1.7 The magnitude of the spin multiplicity of first 3 electronsin 2p<sup>4</sup>is given by:
(a) 4 (b) 3 (c) 2 (d) 1
Ans. a
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1.8 If m = magnetic quantum number and / = azimuthal quantum number, then

(a) m = l + 2 (b) m =  $2l^2 + 1(c)$  (d) l = 2m + 1Ans. c

1.9 The total number of electrons present in p subshell for Si<sub>14</sub> is- a (a) 6 (b) 2(c) 4(d) 0 Ans. a

1.10The following sets of quantum numbers represent four electrons in an atom. (i) n = 4, l = 1 (ii) n = 4, l = 0 (iii) n = 3, l = 2 (iv) n = 3, l = 1In this context, which of the following represents the order of increasing energy? (a) (iv)< (ii)< (ii)< (i) (b) (ii)< (iv)<(i)< (ii) (c) (i)< (ii)< (iv)< (iv) (d) (iii)< (i)< (iv)< (ii) Ans. a

1.11 Which of the following sets of quantum numbers represents the highest energy of an atom?

(a) 
$$n = 4, l = 0, m = 0, s = {+\frac{1}{2}} + {\frac{1}{2}} + {\frac{1}{2}}$$

1.12 Which of the following statements is correct regarding the probability of finding an electron in a  $p_x$  orbital?

(a) It is zero along the x-axis (b) It will be uniform throughout the nucleus.(c) It is the maximum along the x-axis (d) both (b) and (c) are correct.Ans. c

## 1.13 Which of the following 3d orbitals has zero density in all three exes?

(a)  $3d_{xy}(b)$  None of these(c)  $3d_z^2$  (d)  $3d_{x^2-y^2}^2$ Ans. a

## 1.14 Which of the following statements in correct in the context of $3d_{zx}$ orbital?

(a) The orbital consists of two positive lobes along the  $\pm z$  axis and a negative doughnut in the xy plane.

(b) The orbital consists of two negative lobes along the  $\pm z$  axis and a positive doughnut in the xy plane.

(c) The orbital lies on the zx plane

(d) This orbital consists of one positive lobe along the  $\pm z$  axis and a negative doughnut in the xy plane.

## Ans.c

1.15 The maximum number of orbitals in a subshell is given by the expression-

(a) 4/ – 2 (b) 4/ + 2 (c) 2/ + 1 (d) n Ans. d PREPARED BY: MR. ARNAB PAUL CHOWDHURY