

TIME : 20 MIN.

CLASS TEST-01

- An electron cannot have the quantum numbers $n = \dots\dots\dots$, $l = \dots\dots\dots$, $m_l = \dots\dots\dots$
(A) 1, 1, 1 (B) 2, 0, 0 (C) 3, 2, 1 (D) 2, 1, -1
- In a p_x orbital, the subscript x denotes the.....
(A) spin of the electrons (B) size of the orbital
(C) energy (D) axis along which the orbital is aligned
- The..... orbital is degenerate with $5p_y$ in a many electron atom.
(A) $5d_{z^2}$ (B) $4p_y$ (C) $5p_x$ (D) $5d_{xy}$
- Which one of the following orbitals can hold two electrons?
(A) 3s (B) $2p_x$ (C) $4d_{xy}$ (D) All of these
- All of the orbitals in a given electron shell have the same value of the quantum number.
(A) azimuthal (B) principal (C) magnetic (D) spin
- Which one of the following is not a valid value for the magnetic quantum number of an electron in a 5d subshell?
(A) 2 (B) 1 (C) 0 (D) 3
- Which of the subshells below do not exist due to the constraints upon the azimuthal quantum number?
(A) 2s (B) 2p (C) 2d (D) All of these
- In which one of the following pairs of the species are isoelectronic as well as isotopic?
(At. no. of Ca = 20, Ar = 18, K = 19, Mg = 12, Fe = 26, Na = 11)
(A) $^{40}\text{Ca}^{2+}$, ^{40}Ar (B) $^{39}\text{K}^+$, $^{40}\text{K}^+$ (C) $^{24}\text{Mg}^{2+}$, ^{25}Mg (D) ^{23}Na , $^{24}\text{Na}^+$
- Which one of the following represents an acceptable set of quantum numbers for an electron in an atom?
(arranged as n, l, m_l, m_s)
(A) 5, 4, -5, 1/2 (B) 1, 0, 0, 1/2 (C) 2, 2, -1, -1/2 (D) 3, 3, 3, 1/2
- Which of the following is a valid set of four quantum numbers? (n, l, m_l, m_s)
(A) 2, 1, +2, +1/2 (B) 2, 1, 0, +1/2 (C) 1, 1, 0, -1/2 (D) 2, 2, 1, -1/2
- Which one of the following configurations depicts an excited carbon atom?
(A) $1s^2 2s^2 2p^1 3s^1$ (B) $1s^2 2s^2 2p^1$ (C) $1s^2 2s^2 2p^3$ (D) $1s^2 2s^2 2p^2$

12. The ground state electronic configuration of..... is $[\text{Ar}] 4s^1 3d^5$.
 (A) Mn (B) V (C) Fe (D) Cr
13. The ground state electronic configuration of Fe is.....
 (A) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^6 4s^2$ (B) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4d^6$
 (C) $1s^2 2s^2 3s^2 3p^{10}$ (D) $1s^2 2s^2 3s^2 3p^6 3d^6$
14. Which electronic configuration represents correct electronic configuration for an atom in its ground state?
- (A) $\begin{array}{c} 1s \\ \uparrow \end{array} \begin{array}{c} 2s \\ \uparrow \end{array} \begin{array}{c} 2p \\ \uparrow \uparrow \uparrow \end{array}$ (B) $\begin{array}{c} 1s \\ \uparrow \downarrow \end{array} \begin{array}{c} 2s \\ \uparrow \downarrow \end{array} \begin{array}{c} 3s \\ \uparrow \downarrow \end{array} \begin{array}{c} 2p \\ \uparrow \uparrow \end{array}$
- (C) $\begin{array}{c} 1s \\ \uparrow \downarrow \end{array} \begin{array}{c} 2s \\ \uparrow \downarrow \end{array} \begin{array}{c} 2p \\ \downarrow \downarrow \end{array}$ (D) $\begin{array}{c} 1s \\ \uparrow \downarrow \end{array} \begin{array}{c} 2s \\ \uparrow \downarrow \end{array} \begin{array}{c} 2p \\ \uparrow \downarrow \end{array}$
15. Which electronic configuration represents a violation of the $(n + l)$ rule?
- (A) $\begin{array}{c} 1s \\ \uparrow \downarrow \end{array} \begin{array}{c} 2s \\ \uparrow \downarrow \end{array} \begin{array}{c} 2p \\ \uparrow \end{array}$ (B) $\begin{array}{c} 1s \\ \uparrow \downarrow \end{array} \begin{array}{c} 2s \\ \uparrow \end{array} \begin{array}{c} 2p \\ \uparrow \uparrow \uparrow \end{array}$
- (C) $\begin{array}{c} 1s \\ \uparrow \downarrow \end{array} \begin{array}{c} 2s \\ \uparrow \end{array} \begin{array}{c} 2p \\ \end{array}$ (D) $\begin{array}{c} 1s \\ \uparrow \downarrow \end{array} \begin{array}{c} 2s \\ \uparrow \downarrow \end{array} \begin{array}{c} 2p \\ \uparrow \uparrow \downarrow \end{array}$