






Single Correct Answer Type

- Number of waves made an electron in one complete relocation in its 3rd orbit?
(A) 2 (B) 3 (C) 4 (D) 5
- The ratio of the time required for an electron taking one round in 2nd orbit of H-atom and He⁺ ion?
(A) 2 (B) 3 (C) 4 (D) 5
- Find out the quantum number 'n' corresponding to the excited state of He⁺ ion if this ion deexcites to ground state emits only two photons in succession with wave length 1026.7 and 304Å ($R_H = 1.097 \times 10^7 \text{ m}^{-1}$)
(A) 4 (B) 5 (C) 6 (D) 7
- The number of angular nodes for 4d orbital is
(A) 4 (B) 3 (C) 2 (D) 1
- If uncertainty in position and momentum are equal, then uncertainty in velocity is?
(A) $\sqrt{\frac{h}{2\pi}}$ (B) $\frac{1}{m}\sqrt{\frac{h}{2\pi}}$ (C) $\sqrt{\frac{h}{4\pi}}$ (D) $\frac{1}{2m}\sqrt{\frac{h}{\pi}}$
- Which of the following orbital does not have electron density along the axes?
(A) 3p_z (B) 3d_{xy} (C) 3s (D) d_{x²-y²}
- For n = 3, how many times the wave function cross zero for $\ell = 0$?
(A) Once (B) Twice (C) Thrice (D) None
- If the K.E of an electron is increased by four fold, the de Broglie's wave length associated with it becomes.
(A) 4 times (B) 16 times (C) $\frac{1}{2}$ times (D) $\frac{1}{4}$ times
- If the radius of first Bohr's orbit is x, then the de Broglie wave length of an electron in 3rd orbit is
(A) 2πx (B) 6πx (C) 9x (D) $\frac{x}{3}$
- Non-directional orbital among
(A) 3s (B) 4f (C) 4d (D) 4p
- if E₁, E₂, E₃ are kinetic energies of an electron, alpha particle and a proton each having same de Broglie wave length then
(A) E₁ > E₃ > E₂ (B) E₂ > E₃ > E₁ (C) E₁ > E₂ > E₃ (D) E₁ = E₂ = E₃
- Predict the total spin in Ni⁺²
(A) $\pm \frac{5}{2}$ (B) $\pm \frac{3}{2}$ (C) $\pm \frac{1}{2}$ (D) ± 1
- Which of the following has the maximum number of unpaired electrons?
(A) Mg⁺² (B) Ti⁺³ (C) V⁺³ (D) Fe⁺²
- The orbital diagram in which aufbau principle is violated
(A)   (B) 
(C)  (D) 

15. An ion Mn^{a+} has the magnetic moment equal to 4.9 BM. The value of a is
 (A) 3 (B) 4 (C) 2 (D) 5
16. The orbital represented by ψ_{420} is
 (A) $4d_{z^2}$ (B) $4p_x$ (C) $4p_z$ (D) $4d_{xy}$
17. If $\lambda = c_2 \left(\frac{n^2}{n^2 - 2^2} \right)$ for Balmer series, then what is the value of c_2 ?
 (A) $\frac{4}{R_H}$ (B) $\frac{2}{R_H}$ (C) $2R_H$ (D) $4R_H$
18. Which set of quantum numbers given below represents the highest energy of an electron in an orbital?
 (A) $n = 3, \ell = 0, m = 0, s = +\frac{1}{2}$ (B) $n = 3, \ell = 1, m = +1, s = +\frac{1}{2}$
 (C) $n = 3, \ell = 2, m = 2, s = +\frac{1}{2}$ (D) $n = 4, \ell = 0, m = 0, s = +\frac{1}{2}$
19. de Broglie wave length of a proton is λ at $27^\circ C$. At 927° , the de Broglie wave length would be
 (A) λ (B) $\frac{\lambda}{2}$ (C) $\frac{\lambda}{3}$ (D) $\frac{\lambda}{4}$
20. If the wave function of the 2s atomic orbital of H like species is $\psi_{2s} = \frac{1}{\sqrt{32\pi}} Z^{1/2} (2 - Zr) e^{-Zr/2}$. The radius of noded surface for He^+ ion is
 (A) 4\AA (B) 3\AA (C) 2\AA (D) 1\AA

Numerical based

21. An electron in He^+ atom occupies ground state. It is excited to next higher state. The ratio circumference of excited state to ground state is
22. Photons of energy 6 eV are incidented on a potassium surface of work function 2.1 eV what is the stopping potential?
23. The sum of radial nodes of 3S and 2P orbitals is?
24. If the magnetic moment of Mn^{+a} is 3.873 BM, then find sum of number of unpaired electrons and oxidation state of Mn^{+a} ion is ?
25. The total number of degenerate orbitals of an electron in $\psi_{4,2,0}$ of He^+ ion?

KEY

1. B	2. C	3. C	4. C	5. D
6. B	7. B	8. C	9. B	10. A
11. A	12. D	13. D	14. B	15. B
16. A	17. A	18. C	19. B	20. D
21. 4	22. -3.9 eV	23. 2	24. 7	25. 5

* *Wish You all the Best* *