

STELLA MARIS MEDICAL FOUNDATION

CHEMISTRY

STRUCTURE OF ATOM

Total Questions: 30

Total Marks: 120

- The energies E_1 and E_2 of two radiations are 25eV and 50eV respectively. The relation between their wavelengths i.e., λ_1 and λ_2 will be
 a) $\lambda_1 = \lambda_2$ b) $\lambda_1 = 2\lambda_2$ c) $\lambda_1 = 4\lambda_2$ d) $\lambda_1 = \frac{1}{2} \lambda_2$
- If $n = 6$, the correct sequence for filling of electrons will be
 a) $ns \rightarrow (n-2)f \rightarrow (n-1)d \rightarrow np$ b) $ns \rightarrow (n-1)d \rightarrow (n-2)f \rightarrow np$
 c) $ns \rightarrow (n-2)f \rightarrow np \rightarrow (n-1)d$ d) $ns \rightarrow np \rightarrow (n-1)d \rightarrow (n-2)f$
- According to the Bohr theory, Which of the following transitions in the hydrogen atom will give rise to the least energetic photon?
 a) $n=6$ to $n=1$ b) $n=5$ to $n=4$ c) $n=6$ to $n=5$ d) $n=5$ to $n=3$
- A 0.66kg ball is moving with a speed of 100m/s The associated wavelength will be ($h = 6.6 \times 10^{-34} \text{Js}$)
 a) $6.6 \times 10^{-32} \text{m}$ b) $6.6 \times 10^{-34} \text{m}$ c) $1.0 \times 10^{-35} \text{m}$ d) $1.0 \times 10^{-32} \text{m}$
- Maximum number of electrons in a subshell of an atom is determined by the following
 a) $2l+1$ b) $4l-2$ c) $2n^2$ d) $4l+2$
- Which is the correct order of increasing energy of the listed orbitals in the atom of titanium? (At.No. $Z=22$)
 a) $4s \ 3s \ 3p \ 3d$ b) $3s \ 3p \ 3d \ 4s$ c) $3s \ 3p \ 4s \ 3d$ d) $3s \ 4s \ 3p \ 3d$
- The number of d -electrons in Fe^{2+} ($Z=26$) is not equal to the number of electrons in which one of the following?
 a) d -electrons in Fe ($Z=26$) b) p -electrons in Ne ($Z=10$)
 c) s -electrons in Mg ($Z=12$) d) p -electrons in Cl ($Z=17$)
- The angular momentum of electron in 'd' orbital is equal to
 a) $2\sqrt{3} h$ b) $0h$ c) $\sqrt{6} h$ d) $\sqrt{2} h$
- What is the maximum number of orbitals that can be identified with the following quantum numbers?
 $n=3, l=1, m_l=0$
 a) 1 b) 2 c) 3 d) 4
- Calculate the energy in joule corresponding to light of wavelength 45nm. (Planck's constant, $h=6.63 \times 10^{-34} \text{Js}$, speed of light, $c = 3 \times 10^8 \text{m s}^{-1}$)
 a) 6.67×10^{15} b) 6.67×10^{11} c) 4.42×10^{-15} d) 4.42×10^{-18}
- According to law of photochemical equivalence the energy absorbed (in ergs/mole) is given as ($h = 6.62 \times 10^{-27} \text{ergs}$, $c = 3 \times 10^{10} \text{cm s}^{-1}$, $N_A = 6.02 \times 10^{23} \text{mol}^{-1}$)
 a) $\frac{1.196 \times 10^8}{\lambda}$ b) $\frac{2.859 \times 10^5}{\lambda}$ c) $\frac{2.859 \times 10^{16}}{\lambda}$ d) $\frac{1.196 \times 10^{16}}{\lambda}$
- Maximum number of electrons in a subshell with $l = 3$ and $n = 4$ is
 a) 14 b) 16 c) 10 d) 12
- The correct set of four quantum numbers for the valence electron of rubidium atom ($Z=37$) is
 a) 5, 1, 1, +1/2 b) 6, 0, 0, +1/2 c) 5, 0, 0, +1/2 d) 5, 1, 0, +1/2
- The orbital angular momentum of a p -electron is given as
 a) $\frac{h}{\sqrt{2\pi}}$ b) $\sqrt{3} \frac{h}{2\pi}$ c) $\sqrt{3} \frac{h}{\sqrt{2} \pi}$ d) $\sqrt{6} \frac{h}{2\pi}$

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ANSWER KEY

1	B	11	A	21	B
2	A	12	A	22	B
3	C	13	C	23	C
4	C	14	A	24	A
5	D	15	B	25	D
6	C	16	D	26	A
7	D	17	C	27	A
8	C	18	D	28	D
9	A	19	D	29	A
10	D	20	A	30	A