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TARGET : NEET (UG) 2024

Course : SARANSH (Youtube Live CRASH COURSE)

CHEMISTRY
DPP
DAILY PRACTICE PROBLEMS
DPP NO. 1

CHEMISTRY: ATOMIC STRUCTURE

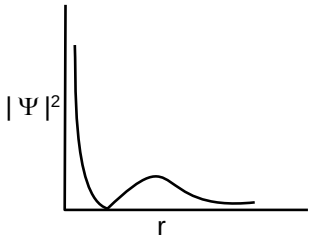
DPP No. : 1

1. If the de Broglie wavelength of the electron in n^{th} Bohr orbit in a hydrogenic atom is equal to $1.5\ \pi a_0$ (a_0 is Bohr radius), then the value of n/z is:

(1) 0.75 (2) 0.40

(3) 1.0 (4) 1. 50

2. The graph between $|\Psi|^2$ and r(radial distance) is shown below. This represents:



(1) 1s orbital (2) 3s orbital

(3) 2p orbital (4) 2s orbital

3. The de Broglie wavelength of an electron in the 4^{th} Bohr orbit is :

(1) $4\pi a_0$ (2) $2\pi a_0$

(3) $6\pi a_0$ (4) $8\pi a_0$

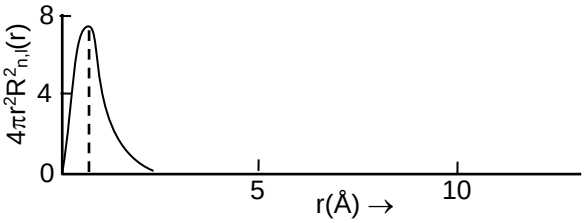
4. The correct statement about probability density (except at infinite distance from nucleus) is :

(1) It can be zero for 1s orbital (2) It can never be zero for 2s orbital

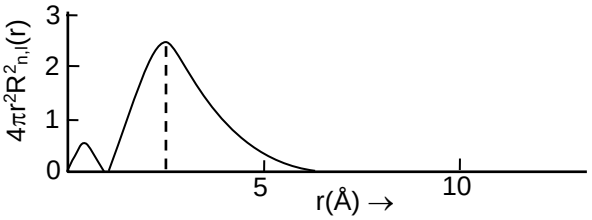
(3) It can be negative for 2p orbital (4) It can be zero for 3p orbital

5. The plots of radial distribution functions for various orbitals of hydrogen atom against 'r' are given below:

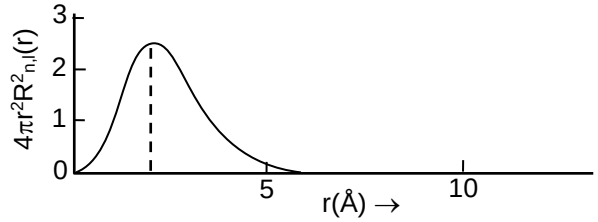
(A)



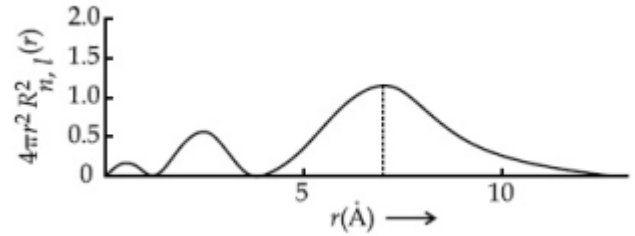
(B)



(C)



(D)



The correct plot for 3s orbital is :

(1) D (2) B (3) (A) (4) (C)

6. A certain orbital has no angular nodes and two radial nodes. the orbital is:

(1) 2s (2) 3p

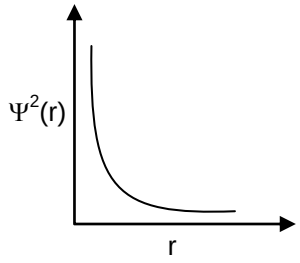
(3) 3s (4) 2p

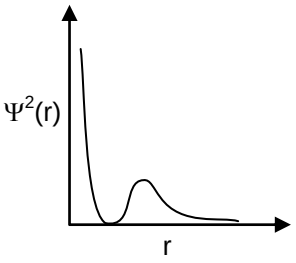
7. The number of radial and angular nodes in 4d orbital are, respectively

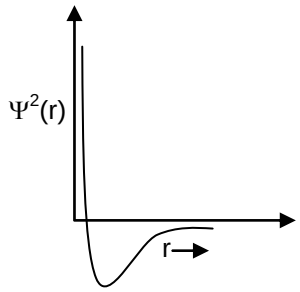
(1) 1 and 2 (2) 3 and 2

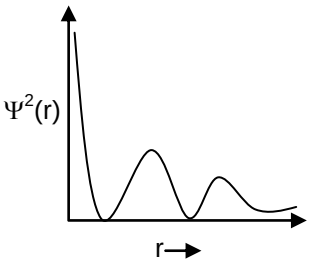
(3) 1 and 0 (4) 2 and 1

8. Which of the following is the correct plot for the probability density $\Psi^2(r)$ as a function of distance 'r' of the electron form the nucleolus for 2s orbital?

(1) 

(2) 

(3) 

(4) 

9. The number of given orbitals which have electron density along the axis is _____

P_x, P_y, P_z, d_{xy}, d_{xz}, d_z2, $d_x2 - y^2$

(1) 5 (2) 2

(3) 1 (4) 3

10. The wave function (Ψ) of 2s is given by

$$\Psi_{2s} = \frac{1}{2\sqrt{2\pi}}\left(\frac{1}{a_0}\right)^{1/2}\left(2-\frac{r}{a_0}\right)e^{-r/2a_0}$$

At $r = r_0$, radial node is formed. Thus, r_0 in terms of a_0

(1) $r_0 = \frac{a_0}{2}$ (2) $r_0 = 2a_0$ (3) $r_0 = 4a_0$ (4) $r_0 = a_0$