Model Question Paper

Atomic Structure - II -Part III

12th Standard

Chemistry

Reg.No. : | | | | | | |

I.Answer all the questions.
II.Use Blue pen only.

Time : 01:15:00 Hrs

Total Marks : 50

Section-A

6 x 1 = 6

1) The momentum of a particle which has de – Broglie wavelength of 1Å (h = 6.626 x 10^{-34} kgm^2s^{-1}) is

   (a) 6.626 x 10^{-24} $kgms^{-1}$ (b) 6.626 x 10^{-36} $kgms^{-1}$ (c) 6.626 $kgms^{-1}$ (d) 66.26 $kgms^{-1}$

2) The bond order of nitrogen molecule is _____

   (a) 2.5 (b) 3 (c) 2 (d) 4

3) Number of spherical nodes in 2s orbital is ___

   (a) 1 (b) 2 (c) 3 (d) 4

4) The hybridisation involved in XeF_6 is _____

   (a) sp^3d^3 (b) sp^3d^2 (c) sp^3d (d) sp^3

5) The type of hybridisation in PCl_5 molecule is ____

   (a) sp^3d^2 (b) sp^3d (c) sp^3 (d) sp^2

6) In a molecule when Nb = 8 and Na = 2, then the bond order is

   (a) 3 (b) 4 (c) 2.5 (d) 2

Section-B

5 x 3 = 15

7) Distinguish particle and wave

8) Explain the significance of de-Broglie waves.

9) State Bohr's quantum condition.

10) What is node? How many nodes are present in ns orbital?

11) What is node? Draw the nodal plane for p_x orbital.

Section-C

6 x 5 = 30

12) The kinetic energy of sub-atomic particle is 5.85×10^{-25} J. Calculate the frequency of the particle wave. (Planck's constant, h=6.626×10^{-34} Js)

13) Calculate the wavelength associated with an electron (mass 9.1×10^{-31}kg) moving with a velocity of $10^3 msec^{-1}$ ($h = 6.626 \times 10^{-34} kg \quad m^2 sec^{-1}$)

14) Calculate the kinetic energy of a moving electron which has a wavelength of 4.8 pm. [mass of electron = $9.11 \times 10^{-31} \quad kg$, $h = 6.626 \times 10^{-34} kg \quad m^2 sec^{-1}$].

15) Two particles A and B are in motion. If the wavelength associated with the particle A is 5×10^{-8} m, calculate the wavelength of particle B, if its momentum is half of A.

16) The uncertainity in the position of a moving bullet of mass 10 g is 10^{-5} m. Calculate the uncertainty in its velocity.

17) a) Calculate the de-Broglie wavelength of an electron that has been accelerated from rest through a potential difference of 1 kV

(OR)

b) A moving electron has 4.55 × 10^{-25} joules of kinetic energy. Calculate its wavelength (mass = 9.1 × 10^{-31} kg and h = 6.626 × 10-34 kg m^2 s^{-1}).

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