INDIAN SCHOOL NIZWA - WORKSHEET

CHEMISTRY

CH2: STRUCTURE OF ATOM

Name: _____ Date: 22.08.2024 Class: XI Sec: A

Answer the following

1. Calculate the number of electrons which will together weigh one gram (Mass of Electron = 9.1 X 10^{-31} Kg).
2. The energy associated with the first orbit in the hydrogen atom is -2.18x10^{-18} J/atom. What is the energy associated with the fifth orbit?
3. Calculate the radius of Bohr's fifth orbit for hydrogen atom.
4. If the velocity of the electron in Bohr's first orbit is 2.19x10^{6} m/s, calculate the de broglie wavelength associated with it.
5. Which of the following are isoelectronic species, i.e., those having the same number of electrons?

   Na^{+}, K^{+}, Mg^{2+}, Ca^{2+}, S^{2-}, Ar
6. An electron is in one of the 3d orbitals. Give the possible values of 'n', 'l' and 'ml' for this electron.
7. Find the radial node, angular node and total nodes present in '4d' orbital.
8. Name the 'd'-orbitals which are found in between the axis and along the axis respectively.
9. Sketch (draw) the shapes of different orbitals of 'p' and 'd' orbitals.
10. State the following principles:
    (i) Heisenberg Uncertainty Principle
    (ii) Aufbau Principle
    (iii) Hund's Rule of Maximum Multiplicity
    (iv) Pauli's Exclusion Principle
11. Write electronic configuration of Cu^{2+} (29) and Cr^{3+} (24).
12. An orbital has l = 3, what are the possible values of ml?
13. Which quantum number determines (i) Energy of electron
    (ii) Orientation of orbitals, and (iii) Shape of orbitals?

14. An atom of an element contains 29 electrons and 35 neutrons. Deduce
    (i) Number of protons
    (ii) Electronic configuration of the element
    (iii) Number of paired electrons
    (iv) Number of unpaired electrons
15. Calculate the uncertainty in the position of a dust particle with mass equal to 1 mg, if the uncertainty in velocity is 5.5×10^{-20} m/s. ($h=6.626 \times 10^{-34}$ Js)
16. Give quantum numbers for electrons with highest energy in Sodium atom (Z = 11).
17. What are the atomic numbers of elements whose outermost electrons are represented by (i) $3s^1$ (ii) $2p^3$ (iii) $3p^5$
18. Write the electronic configuration of the following ions:
    (i) H^-
    (ii) Na^+
    (iii) O^{2-}
    (iv) F^-
19. Write the outer electronic configuration of Chromium atom (Z=24). Why are half filled orbitals more stable?
20. Give quantum numbers for electrons with highest energy in sodium atom (Z=11).
