DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth **SUBJECT : CHEMISTRY**
DATE : **DPP No. : 1**

Topic :- STRUCTURE OF ATOM

1. Mg^{2+} is isoelectrionic with
   a) Cu^{2+} b) Zn^{2+} c) Na^{+} d) Ca^{2+}

2. The first orbital of H is represented by :
   $\psi = \frac{1}{\sqrt{\pi}}\left(\frac{1}{a_0}\right)^{3/2} e^{-r/a_0}$, where a_0 is Bohr's radius. The probability of finding the electron at a distance r, from the nucleus in the region dV is:
   a) $\psi^2 dr$ b) $\int \psi^2 4\pi r^2 dv$ c) $\psi^2 4\pi r^2 dr$ d) $\int \psi dv$

3. The correct statement about proton is
   a) It is a nucleus of deuterium b) It is an ionized hydrogen atom
   c) It is an ionized hydrogen molecules d) It is an α- particle

4. The energy ΔE corresponding to intense yellow line of sodium of λ, 589 nm is:
   a) 2.10 eV b) 43.37 eV c) 47.12 eV d) 2.11 kcal

5. One electron volt is:
   a) 1.6×10^{-19} erg b) 1.6×10^{-12}erg c) 1.6×10^{-8} erg d) 1.6×10^{8} erg

6. The quantum number that is in no way related to other quantum number is:
   a) l b) s c) n d) m

7. The de-Broglie wavelength relates to applied voltage ror α-particles as
   a) $\lambda = \frac{12.3\text{A}^\circ}{\sqrt{V}}$ b) $\lambda = \frac{0.286}{\sqrt{V}}\text{A}^\circ$ c) $\lambda = \frac{0.101}{\sqrt{V}}\text{A}^\circ$ d) $\lambda = \frac{0.856}{\sqrt{V}}\text{A}^\circ$

8. Calculate the wavelength (in nanometer) associated with a proton moving at $1.0 \times 10^3 ms^{-1}$ (Mass of proton $= 1.67 \times 10^{-27}$kg and $h = 6.63 \times 10^{-34}$ Js)
   a) 0.032 nm b) 0.40 nm c) 2.5 nm d) 14.0 nm

9. The number of waves in an orbit are
   a) n^2 b) n c) $n-1$ d) $n-2$

10. Which of the following electron transition in hydrogen atom will require largest amount of energy?
    a) From $n = 1$ to $n = 2$ b) From $n = 2$ to $n = 3$
    c) From $n = \infty$ to $n = 1$ d) From $n = 3$ to $n = 5$

11. The principal quantum number n can have integral values ranging from:
    a) 0 to 10 b) 1 to ∞ c) 1 to $(n = l)$ d) 1 to 50

12. Electrons will first enter into the set of quantum numbers $n = 5, l = 0$ or $n = 3, l = 2$
    a) $n = 5, l = 0$ b) Both possible c) $n = 3, l = 2$ d) Data insufficient

13. The relationship between the energy E_1 of the radiation with a wavelength 8000Å and the energy E_2 of the radiation with a wavelength 16000Å is
    a) $E_1 = 6E_2$ b) $E_1 = 2E_2$ c) $E_1 = 4E_2$ d) $E_1 = 1/2E_2$

14. Which combinations of quantum numbers n, l, m and s for the electron in an atom does not provide a permissible solution of the wave equation?
    a) 3, 2, 1, $\frac{1}{2}$ b) 3, 1, 1, $-\frac{1}{2}$ c) 3, 3, 1, $-\frac{1}{2}$ d) 3, 2, -2, $\frac{1}{2}$

15. What is the lowest energy of the spectral line emitted by the hydrogen atom in the Lyman series? (h=Planck's constant, c=velocity of light, R=Rydberg's constant).
    a) $\frac{5hcR}{36}$ b) $\frac{4hcR}{3}$ c) $\frac{3hcR}{4}$ d) $\frac{7hcR}{144}$

16. Which is not electromagnetic radiation?
    a) Infrared rays b) X-rays c) Cathode rays d) γ-rays

17. Which one of the following sets of quantum numbers represents the highest energy level in an atom?
    a) $n = 4, l = 0, m = 0, s = +\frac{1}{2}$ b) $n = 3, l = 1, m = 1, s = +\frac{1}{2}$
    c) $n = 3, l = 2, m = -2, s = +\frac{1}{2}$ d) $n = 3, l = 0, m = 0, s = +\frac{1}{2}$

18. Which consists of particle of matter?
    a) Alpha rays b) Beta rays c) Cathode rays d) All of these

19. If λ_1 and λ_2 are the wavelength of characteristic X-rays and gamma rays respectively, then the relation between them is:
    a) $\lambda_1 = 1/\lambda_2$ b) $\lambda_1 = \lambda_2$ c) $\lambda_1 > \lambda_2$ d) $\lambda_1 < \lambda_2$

20. Which best describe the emission spectra of atomic hydrogen?
    a) A series of only four lines
    b) A discrete series of lines of equal intensity and equally spaced with respect to wavelength
    c) Several discrete series of lines with both intensity and spacings between lines decreasing as the wave number increase within each series
    d) A continuous emission of radiation of all frequencies