CHEMISTRY

1. As per the Bohr's model, the minimum energy (in eV) required to remove an electron from the ground state of doubly ionized Li atom (Z = 3) is

   A) 1.51 B) 13.6 C) 40.8 D) 122.4

2. The hybridization of **Xe** in $\mathbf{XeF_4}$ is

   A) sp^3d B) dsp^2 C) sp^3d^2 D) sp^2d^3

3. The X-ray beam coming from an X-ray tube will be

   A) monochromatic

   B) having all wavelengths smaller than a certain maximum wavelength

   C) having all wavelengths larger than a certain minimum wavelength

   D) having all wavelengths lying between a minimum and a maximum wavelength

4. Which one of the following causes increase in entropy?

   A) A liquid crystallizes into a solid

   B) Water vapor condensation into liquid

   C) Decomposition of $NaHCO_3$ at 102°C

   D) Diffusion of two similar gas mixture into each other in a closed container isolated from the surroundings

5. The reaction that takes place at anode is

   A) ionization B) reduction C) oxidation D) hydrolysis

6. Which of the following statement(s) is/are correct about *trans*-1,2-dimethylcyclohexane?

   I. Two methyl groups can exist in diaxial orientation.

   II. Two methyl groups can exist in axial-equatorial or equatorial-axial orientation.

   III. Two methyl groups can exist in diequatorial orientation.

   A) I only B) II only C) I and II only D) I and III only

7. Find the correct order of their boiling points of the following alcohols:

   methanol, *n*-propyl alcohol, *iso*-propyl alcohol

   A) methanol < *n*-propyl alcohol < *iso*-propyl alcohol

   B) methanol > *n*-propyl alcohol > *iso*-propyl alcohol

   C) methanol < *iso*-propyl alcohol < *n*-propyl alcohol

   D) methanol > *iso*-propyl alcohol > *n*-propyl alcohol

8. Reaction of _____ with Grignard reagent followed by hydrolysis yields ketone.

   A) esters B) aldehyde C) alkyl nitrile D) acid chloride

9. Benzoic acid can be prepared from toluene by treatment with

   A) $KMnO_4$-KOH B) Grignard reagent in ether followed by dry ice and acid hydrolysis

   C) Tollens' reagent D) HBr/KCN followed by acid hydrolysis

10. The number of amino acid units present in insulin is

    A) 42 B) 51 C) 8 D) 32