

DEPARTMENT OF CHEMISTRY

Sample Paper for the Aptitude Test for Admission into MSc First Semester.

Choose and encircle the correct option.

1. A system which can exchange matter as well as energy with its surroundings is said to be an
(a) isolated system (b) open system (c) inert system (d) closed system.
2. The spontaneous change in which a liquid changes into the vapour state at the surface is known as
(a) Vapour pressure (b) evaporation (c) boiling point (d) none of the above.
3. The units of surface tension in the SI system are
(a) dynes per cm (b) Newton per meter (c) Newton per meter square (d) Pascal.
4. The energy of a photon of light is inversely proportional to its
(a) frequency (b) wavelength (c) wave number (d) all of these.
5. When either chlorine or hydrogen chloride is passed over a heated metal M, the same chloride is produced. An aqueous solution of this chloride is acidic. Which one of the following could be M?
(a) aluminium (b) barium (c) copper (d) iron
6. Which substance produces iodine when added to solid potassium iodide?
(a) aqueous silver nitrate (b) concentrated hydrochloric acid (c) concentrated sulphuric acid (d) solid lead(II) oxide.
7. Under appropriate conditions, NH_4Br and KNH_2 react as follows:
$$\text{NH}_4\text{Br} + \text{KNH}_2 \rightarrow \text{KBr} + 2\text{NH}_3$$

How is the reaction best classified?
(a) acid – base (b) condensation (c) disproportionation (d) oxidation-reduction.
8. What is the IUPAC name for the following compound?
$$\text{CH}_3 - \text{C} \equiv \text{C} - \overset{\text{CH}_3}{\underset{|}{\text{CH}}} - \text{CH} = \text{CH}_2$$

(a) 4-vinyl-2-pentyne (b) 4-methylhex-2-yn-5-ene (c) 3-methylhex-4-yn-1-ene (d) 3-methylhex-1-en-4-yne.
9. Arrange the following groups in decreasing order of priority for E/Z nomenclature with the highest priority group listed first.
$$\begin{array}{ccc} \begin{array}{c} \text{CH}_3 \\ | \\ \text{---CH---CH}_3 \\ \text{“A”} \end{array} & \begin{array}{c} \text{---F} \\ \text{“B”} \end{array} & \begin{array}{c} \text{---CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_3 \\ \text{“C”} \end{array} \end{array}$$

(a) B>A>C (b) B>C>A (c) A>C>B (d) C>A>B.
10. Which of the following halides will react most rapidly in an $\text{S}_{\text{N}}2$ reaction?
(a) CH_3F (b) CH_3Cl (c) CH_3Br (d) CH_3I .