



INDIAN SCHOOL SOHAR
CHEMISTRY THEORY (043)
UNIT TEST 1 (2024-25)

SET-1

CLASS : XII
DATE : 26/05/24

MAX. MARK : 20
TIME : 40 MINUTES

General instructions:

1. There are **10** questions in this question paper with internal choice.
2. SECTION A- consists of 6 multiple-choice questions carrying **1** mark each.
3. SECTION B- consists of 1 very short answer questions carrying **2** marks each.
4. SECTION C- consists of 1 short answer questions carrying **3** marks each.
5. SECTION D- consists of 1 case-based question carrying **4** marks.
6. SECTION E- consists of 1 long answer questions carrying **5** marks with internal choice.
7. **All questions are compulsory.**
8. **Use of log tables and calculators is not allowed**

SECTION – A

The following questions are multiple –choice with one correct answer. Each question carries 1 mark. There is no internal choice in this section.

1. Which of the following is the correct order of decreasing S_N^2 reactivity? 1
 - a) $RCH_2X > R_2CHX > R_3CX$
 - b) $R_3CX > R_2CHX > RCH_2X$
 - c) $R_2CHX > R_3CX > RCH_2X$
 - d) $RCH_2X > R_3CX > R_2CHX$
2. Haloalkanes contain halogen atom (s) attached to the sp^3 hybridised carbon atom of an alkyl group. Identify haloalkane from the following compounds. 1
 - a) 2-Bromopentane
 - b) Vinyl chloride (chloroethene)
 - c) 2-chloroacetophenone
 - d) chlorobenzene
3. Compound 'A' of molecular formula $C_4H_{10}O$ on treatment with Lucas reagent at room temperature gives a compound 'B'. When compound 'B' is heated with alcoholic KOH, it gives isobutene. Compound 'A' and 'B' are respectively 1
 - a) 2-Methyl-2propanol and 2-chloro-2-mehtyl-propane
 - b) 2-Methyl-1-propanol and 1-chloro-2methyl-propane
 - c) 2-Methyl-1-propanol and 2-chloro-2methyl-propane
 - d) Butan-2-ol and 2-chlorobutane
4. If 2 gm of NaOH is present in 200 ml of its solution, its molarity will be 1
 - a) 10
 - b) 0.5
 - c) 5
 - d) 0.25

In the following questions (Q.no.5 and 6) a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices:

- (a) Assertion and reason both are correct statements and reason is the correct explanation for assertion.
- (b) Assertion and reason both are correct statements, but reason is **not** the correct explanation for assertion.
- (c) Assertion is correct statement, but reason is wrong statement.
- (d) Assertion is wrong statement, but reason is correct statement.

5. **Assertion** : An ether is more volatile than an alcohol of comparable molecular mass. 1
Reason : Ethers are polar in nature.
6. **Assertion** : It is difficult to replace chlorine by –OH in chlorobenzene in comparison to that 1
in chloroethane.
Reason : Chlorine-carbon (C—Cl) bond in chlorobenzene has a partial double bond
character due to resonance.

SECTION B

7. At 10% solution by mass of sucrose in water has freezing point of 269.15 K. Calculate the 2
freezing point of 10% glucose solution in water if freezing point of pure water is 273.15 K.
(Molar mass of sucrose 342 gram/mole.)

SECTION C

8. **A.** Anisole on reaction with HI gives phenol and $\text{CH}_3\text{-I}$ as main products and not iodobenzene 3
and CH_3OH . Give reason.
B. Name the reagents used in the following reactions:
i) Oxidation of primary alcohol to aldehyde.
ii) Butan-2-one to butan-2-ol.

SECTION D

The following question is a case-based question. Read the passage carefully and answer the four questions that follow.

9. When two liquids are mutually soluble in each other in all proportions, behave ideally. They 4
obey Raoult's law, which describes the Vapour pressure of each component as a function of
its concentration as mole fraction. The composition of the vapour over an ideal liquid-liquid
solution is always richer in the component having the higher vapour pressure. However,
many liquid solutions show deviation from ideality, which indicates certain solute-solvent
interactions. These non-ideal solutions are of two types; one showing positive deviations
from Raoult's law, and the other showing negative deviation from Raoult's law. The ideal
solution can be separated from each other by fractional distillation, the one with higher
vapour pressure would be enriched in the vaporization part, and the other with the lower
vapour pressure would be enriched in the vaporization part and other with the lower vapour
pressure would accumulate in the residue of the distillation process. However, liquids
forming non-ideal solution cannot be separated completely by distillation process. They form
constant boiling mixtures corresponding to definite composition. Such mixtures are called
azeotropes.

A. Choose the most appropriate answer:-

- i) Which of the following is not true about ideal solution?
a. $\Delta_{\text{mixing}} H = 0$
b. $\Delta_{\text{mixing}} G = 0$
c. $\Delta_{\text{mixing}} V = 0$
d. Obeys Raoult's law
- ii) Acetone and chloroform form a non-ideal solution with negative deviation from
Raoult's law. In this solution, the interaction Between acetone and chloroform are
a. Same as those of pure chloroform and acetone.
b. More than those in chloroform and pure acetone.
c. Less than those in pure chloroform and pure acetone.
d. More than those in pure chloroform, but less than those in pure acetone.

B. Calculate the mole fraction of benzene in solution containing 30% by mass in carbon-tetrachloride.

OR

Calculate the molality of KI if the density of 20%(mass/mass) aqueous KI is 1.202g/ml. (Atomic mass of Iodine is 127g)

SECTION E

The following question is a long answer type, carrying five marks with an internal choice.

10. A. How the following conversions can be carried out ?

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- i) 2-chloropropane to Propanol
- ii) Benzyl alcohol to 2- phenylethanoic acid
- iii) Phenol to Anisole

B. Write the mechanism of acid catalyzed dehydration of ethanol to yield ethene.

OR

An organic compound, **A(C₂H₆O)** reacts with sodium to form a compound **B** with the evolution of H₂ and gives a yellow compound **C** when treated with iodine and NaOH. When heated with concentrated H₂SO₄ at 413 K, it gives a compound **D(C₄H₁₀O)**. which on treatment with concentrated HI at 373 K gives **E**. D is also obtained when B is heated with E. Identify A, B, C, D and E. Write equation for the reaction involved.
