

Summer assignment -1

Standard -12 (SCIENCE)

1. Which type of ketones can reduce Tollen's reagent or Feling's solution? 1
2. What is the value of 'i' for $K_3[Fe(CN)_6]$? 1
3. What is Schiff's base? 1
4. Draw the structure of 1-Bromo-4-sec-butyl-2-methylbenzene. 1
5. Define antifreeze with proper example. 1
6. How will you convert carbonyl compounds to α -hydroxy acids or α,β -unsaturated acids? 2
7. Roul't's law is a special case of Henry's law –justify the statement. 2
8. Explain the following reactions – a)Wurtz-fittig reaction b)Ullmann biaryl synthesis 2
9. Acetophenone on reaction with hydroxylamine hydrochloride can produce two isomeric oximes. Write the structures of the oximes. 2
10. Calculate the amount of benzoic acid required for preparing 250 mL of 0.15 M solution in methanol. 2
11. You are provided with four reagents : $LiAlH_4, I_2/NaOH, NaHSO_3$ Schiff's reagent. Write which two reagents can be used to distinguish between the compounds in each of the following pairs: 3
 - a) CH_3CHO and CH_3COCH_3 b) CH_3CHO and C_6H_5CHO c) $C_6H_5COCH_3$ and $C_6H_5COC_6H_5$
- 12.a) Why is an increase in temperature observed on mixing chloroform and acetone? 3
 - b) Derive an equation to express that relative lowering of vapour pressure for a solution is equal to the mole fraction of the solute in it when the solvent alone is volatile.
13. Do the following conversions- 3
 - a) Cyclohexene to hexane-1,6-dioic acid
 - b) 3-Nitrobromobenzene to 3-nitrobenzoic acid
 - c) Butan-2-one to butane.
14. Give reason for the following – 3
 - a) Benzyl chloride is highly reactive towards the S_N1 reaction .
 - b) Vinyl chloride is hydrolysed more slowly than ethylchloride
 - c) 2-Bromobutane is optically active but 1 – Bromobutane is optically inactive
15. Calculate the freezing point depression expected for 0 .0711 m aqueous solution of Na_2SO_4 . If this solution actually freezes at $-0.320^\circ C$ what would be the value of van't Hoff factor? 3
(K_f for water is $1.86 K \text{ kg mol}^{-1}$)
16. A ketone (A) which undergoes haloform reaction gives compound (B) on reduction. (B)on heating with conc. H_2SO_4 gives a compound (C) which forms monozonide (D). (D) on hydrolysis in the prensence of zinc dust gives only acetaldehyde. Identify (A) ,(B) ,(C) and (D). Write down the reactions involved 5
- 17.a) Which of the following solutions will have the highest boiling point.
 - i) 1 M $BaCl_2$ ii) 1 M $FeCl_3$
 - b) At 300 K, 36 g of glucose present per litre of its solution has an osmotic pressure of 4.98 bar. If the osmotic pressure of the solution is 1.52 bar at the same temperature, what would be its concentration?

Summer Assignment-2

Std-12 (SCIENCE)

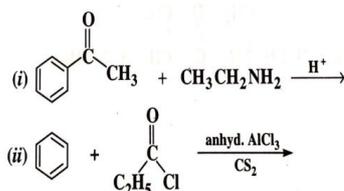
- 1) What is reverse osmosis? 1
- 2) Give the name of the reagent that bring the following transformation: 1
But-2-ene to ethanol
- 3) Draw the vapour pressure-temperature curve showing elevation in boiling point of solution. 1
- 4) What do you understand by the term that k_f for water is $1.86 \text{ k kg mole}^{-1}$ 1
- 5) Write the structure of 1-Bromo-4 sec-butyl-2-methylbenzene 1
- 6) Give reason for the following: 2
- A) Benzaldehyde reduces Tollen's reagent but not the Fehling's or Benedict's solution.
- B) p^{ka} of chloroacetic acid is lower than p^{ka} of acetic acid.
- 7) What product will be formed on reaction of propanal with 2-methyl propanal in the presence of NaOH? Write the name of the reaction also. 2
- 8) Give the IUPAC name of DDT. Write the chemical equation for the manufacture of DDT in the laboratory. 2
- 9) An organic compound (A) with molecular formula C_8H_8O gives positive DNP test and idoform tests. It does not reduce Tollen's or Fehling's reagent and does not decolourise bromine water also. On oxidation with H_2CrO_4 , it gives a carboxylic acid (B) with molecular formula $C_7H_6O_2$. Deduce the structure of A and B. 2
- 10) Account for the following: 2
- a) The use of pressure cooker reduces cooking time.
- b) Cutting onions taken from the fridge is more comfortable than cutting onions lying at room temperature.
- 11) Give an example of the following reactions-a) Gatterman's reaction b) Finkelstein reaction c) Sandmeyer's reaction. 3
- 12) What happens when- 3
- a) 2-Bromo-2-methylpropane is heated with ethanol solution of potassium hydroxide
- b) 3-Phenyl propene is treated with HBr and H_2O_2
- c) Neo-pentyl bromide is heated with C_2H_5ONa/C_2H_5OH
- 13) A decimolar solution of potassium ferrocyanide is 50% dissociated at 300 K. Calculate the osmotic pressure of the solution. ($R=8.314 \text{ J K}^{-1} \text{ mol}^{-1}$) 3
- 14) a) Why is an increase in temperature observed on mixing chloroform and acetone? 3
- b) Derive an equation to express that relative lowering of vapour pressure for a solution is equal to the mole fraction of the solute in it when the solvent alone is volatile.
- 15) How the following conversions can be carried out? 3
- a) Ethanol to But-2-yne b) But-1-ene to n-butyl iodide c) Anilineto chlorobenzene.
- 16) Write the mechanism for the following reactions: 5
- a) Esterification reaction b) Addition of HCl to isobutylene
- 17) a) Define the term osmotic pressure. 5

b) Describe how the molecular mass of a substance can be determined by a method based on measurement of osmotic pressure. How is that measurement of osmotic pressure more widely used for determining molar masses of macro molecules than the elevation in boiling point or depression in freezing point of their solutions?

Summer Assignment-3

Std-12 (SCIENCE)

1. Why is glycol and water mixture used in car radiators in cold countries? 1
2. Give one chemical test to distinguish between C_2H_5Br and C_6H_5Br . 1
3. How will you explain that aldehydes are more reactive than ketones? 1
4. What is Tollen's reagent? 1
5. Define Meso compound. 1
6. State Henry's law. What is the significance of K_H ? 2
7. a) Why is an increase in temperature observed on mixing Chloroform and Acetone? 2
b) What is Cryoscopic constant?
8. Arrange the following compounds in increasing order of their property as indicated. 2
a) Acetaldehyde, acetone, di-tert-butyl ketone, tert-butylmethyl ketone (reactivity towards HCN)
b) Benzoic acid, 4-nitrobenzoic acid, 3,4-dinitrobenzoic acid, 4-methoxybenzoic acid (acid strength)
9. When and why is molality preferred over molarity in handling solutions in Chemistry? 2
10. Predict the products of the following reactions: 2



11. Name the reagents used in the following reactions: 3
a) Bromination of Phenol to 2,4,6 tribromophenol
b) Butane-2-one to Butan-2-ol
c) Friedel-crafts alkylation of anisole
12. a) What happens when cyclohexane carbaldehyde reacts with 3
I. $PhMgBr$ and then H_3O^+
II. $Zn-Hg$ and dilute HCl
b) Write the structure of Diphenyl methanone.
13. a) After removing outer shell of two eggs in dilute HCl , one is placed in distilled water while the other is placed in a saturated solution of Sodium Chloride. What will you observe and why?
b) Why is liquid Ammonia bottle first cooled in ice before opening it? 3
14. a) Differentiate between retention and inversion. 3
b) Which one of the following has the highest dipole moment?
I. $CHCl_3$
II. CH_2Cl_2
15. Account for the following: 3
a) Haloalkanes easily dissolve in organic solvents.
b) Benzyl chloride undergoes S_N1 reaction faster than cyclohexyl methyl chloride.
c) Butan-2-ol is optically inactive.
16. a) Differentiate between the following pairs: 5
I. Maximum boiling azeotrope and minimum boiling azeotrope.
II. Hypotonic solution and Hypertonic solution.

- b) The vapour pressure of pure liquids A and B are 450 and 700 mm of Hg respectively at 350 K. Find out the composition of the liquid mixture if the total vapour pressure is 600 mm. Also find the composition of vapour pressure.
17. An organic compound 'A' (C_3H_4) on hydration in presence of $H_2SO_4/HgSO_4$ gives compound 'B' (C_3H_6O). Compound 'B' gives white crystalline product (D) with sodium hydrogensulphite. It gives negative Tollens' test and positive iodoform's test. On drastic oxidation 'B' gives compound 'C' ($C_2H_4O_2$) along with formic acid. Identify compounds 'A', 'B' and 'C' and explain all the reactions.

COMPLETE THE PRACTICAL NOTEBOOK (2- EXPERIMENTLS)