P. P. SAVANI UNIVERSITY

Third Semester of B.Sc. Examination
December-2021
SSCH2090–Functional Group in Organic Chemistry
10.12.2021, Friday **Time: 09:00 a.m. to 11:30 a.m.** **Maximum Marks: 60**

Instructions:
1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

Section-I (Total Marks - 30)

Q.1 Short Questions **[10]**

1.1 Objectives **[05]**

1.1a Which reagent is used for the conversion of primary alcohols to aldehydes?
- **A** $CrO_3.2C_2H_5N$
- **B** $CrO_3.C_2H_5N$
- **C** $CrO_4.2C_2H_5N$
- **D** $CrO_4.C_2H_5N$

1.1b Aldehydes or ketones heated with primary amine, which products are form?
- **A** 2° Amines
- **B** Amides
- **C** Imides
- **D** Imines

1.1c Clemmensen reduction of ketone is carried out in the presence of which of the following?
- **A** H_2/Pt as catalyst
- **B** Zn-Hg with HCl
- **C** $LiAlH_4$
- **D** None of the above

1.1d Which reagent is used for the conversion of 3-pentanone to 2-pentanone?
- **A** Zn-Hg/HCl
- **B** SeO_2
- **C** $K_2Cr_2O_7/H_2SO_4$
- **D** Iodine/NaOH

1.1e Which type of hybridization shown in carbonyl carbon in aldehyde?
- **A** sp^3d
- **B** sp
- **C** sp^2
- **D** sp^3

1.1f When two moles of acetaldehyde undergo Aldol Condensation reaction. Which product is form?
- **A** β-hydroxy ketone
- **B** β-hydroxy aldehyde
- **C** Both **A** and **B**

D None of the above

1.1g Carboxylic acids reacts with $SOCl_2$ or PCl_5 gives

A Acids chlorides
B Acid dichlorides
C Acid trichlorides
D None of the above

1.1h Which of the following acid is used in the making of backing powder?

A Oxalic acid
B Tartaric acid
C Lactic acid
D Citric acid

1.1i Phthalic anhydride converted into phthalic acid by which reaction?

A Decarboxylation
B Oxidation
C Hydrolysis
D Ammonolysis

1.1j Reduction of CH_3COCl in presence of $LIAlH_4$ gives

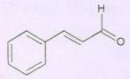
A Methanol
B Ethanol
C Propanol
D Butanol

1.2 Answer the Following: (MCQ/Short Question/Fill in the Blanks) [05]

1.2a Give an example of cyclic acetal as protecting group.

1.2b What is Carbinolamine? Give general structure of it.

1.2c Give the name of following compound:

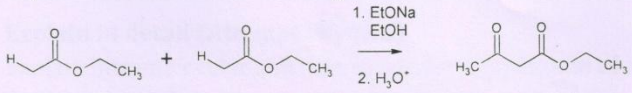


1.2d What is enamines?

1.2e Give an example of acid chloride formation reaction.

Q.2 Short Notes (Attempt any two) [06]

A Give formation of biological active cyclic hemiacetal.
B Write a short notes on Fisher's Esterification.
C Explain mechanism of following reaction:



Q.3 Explain in detail (Attempt any two) [14]

A What is acetal and hemiacetal? Explain mechanism of acetal formation.
B What is Michael addition? Explain in details with example.
C Explain mechanism of Malonic acid synthesis via enol formation.

Section-II (Total Marks - 30)

Q.1 Short Questions [10]

1.1 Objectives [05]

1.1a Ether have _____.

- **A** Pungent odour
- **B** Pleasant odour
- **C** Fishy odour
- **D** Vinegar odour

1.1b Ethanol containing some methanol is called

- **A** Absolute spirit
- **B** Rectified spirit
- **C** Power alcohol
- **D** Methylated spirit

1.1c Which of the following can work as a dehydrating agent for alcohols?

- **A** H_2SO_4
- **B** Al_2O_3
- **C** H_3PO_4
- **D** All

1.1d Which of the following cannot be considered as use of ether?

- **A** Inert solvent
- **B** Anaesthetic
- **C** Antipyretic
- **D** Solvent of oil, fats and resins

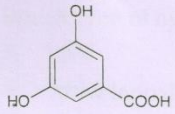
1.1e Glycerol is a _____

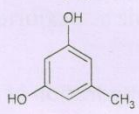
- **A** Primary alcohol
- **B** Monohydric alcohol
- **C** Secondary alcohol
- **D** Trihydric alcohol

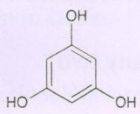
1.1f Because of following properties ether are used as inert reaction medium.

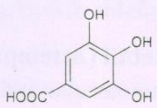
- **A** Neutral and good solvent
- **B** Neutral and bad solvent
- **C** Acidic and good solvent
- **D** Basic and good solvent

1.1g Structure of gallic acid is:

(a) 

(b) 

(c) 

(d) 

- **A** (a)
- **B** (b)
- **C** (c)
- **D** (d)

1.1h Vanillin is obtained by using:

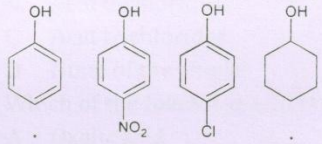
- **A** Reimer-Teiman Reaction
- **B** Hoffman bromide Reaction

C Houben-Hosches Reaction

D Gatterman Reaction

1.1i Which is most acidic?

(a) (b) (c) (d)



A (a)

B (b)

C (c)

D (d)

1.1j When diethyl ether is treated with hot HI, it forms _____.

A Ethyl Iodide

B Acetyl Iodide

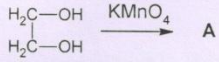
C Propyl Iodide

D Ethyl alcohol

1.2 Answer the Following: (MCQ/Short Question/Fill in the Blanks) **[05]**

1.2a Give the structure of 2,3-dimethylcyclooctanol.

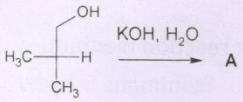
1.2b What is **A** in the following reaction?



1.2c Arrange following in increasing acidic strength:
o-nitrophenol, p-nitrophenol, phenol, m-nitrophenol.

1.2d Why phenols are more acidic than alcohol?

1.2e Write the product in the following reaction?



Q.2 Short Notes (Attempt any two) **[06]**

A Give detail classification of alcohols.

B Do the conversion: Aniline to Chlorobenzene

C Give some important chemical reactions of epoxide.

Q.3 Explain in detail (Attempt any two) **[14]**

A Explain intramolecular and intermolecular dehydration of alcohol with mechanism.

B How –OH group of phenol react chemically? Explain with reactions.

C Give detail account on Williamson synthesis of ether.