

B.Sc. CHEMISTRY
FOURTH SEMESTER
ORGANIC CHEMISTRY-III
BSC – 401
[USE OMR FOR OBJECTIVE PART]

SET
A

Duration: 3 hrs.

Full Marks: 70

Time: 30 min.

(Objective)

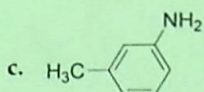
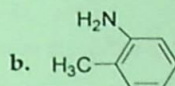
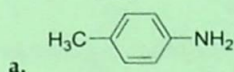
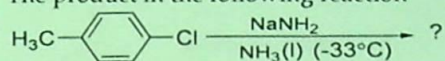
Marks: 20

Choose the correct answer from the following:

1X20=20

1. For preparation of any s-alcohol using Grignard reagent (GR), need
- GR + HCHO
 - GR + RCHO
 - GR + Ketone
 - GR + H₂O

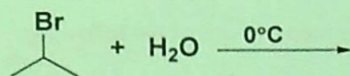
2. The product in the following reaction



both a and c

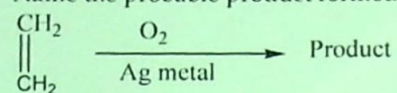
d.

3. Which of the following organometallic compound will be most reactive
- Organo-Mg
 - Organo-Li
 - Organo-Zn
 - Organo-Hg
4. The following reaction will predominantly be a



- Substitution reaction and follow SN² mechanism.
 - Substitution reaction and follow SN¹ mechanism.
 - Elimination reaction and follow E² mechanism.
 - Elimination reaction and follow E¹ mechanism.
5. A and B in the following sequence of reactions are respectively
- $$\text{ROH} \xrightarrow{\text{PBr}_3} \text{A} \xrightarrow{\text{AgCN}} \text{B}$$
- RBr and RCN
 - RBr and RNC
 - ROBr and RNC
 - ROBr and RCN

6. Neopentyl alcohol belongs to which of the following classes?
- Primary alcohol
 - Sec- alcohol
 - Tertiary alcohol
 - None of these
7. Ethylene glycol reacts with excess of PCl_5 to give
- Chloroethane
 - 1,2-Dichloroethane
 - 1,1-Dichloroethane
 - Propanol-2
8. The IUPAC name of sec-butyl alcohol is
- Butan-1-ol
 - 2-Methyl propan-2-ol
 - 2-Methyl propan-1-ol
 - Butan-2-ol
9. Name the probable product formed in the following reaction

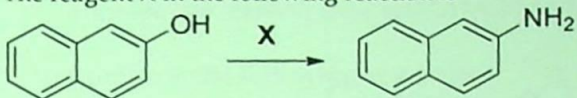


- Ethylene oxide
 - Propylene oxide
 - Acetic acid
 - Formic acid
10. Which of the following products is likely to have formed in the following reaction?
- $$\begin{array}{c} \text{CH}_2\text{OH} \\ | \\ \text{CH}_2\text{OH} \end{array} \xrightarrow[\text{ZnCl}_2]{\text{anhydrous}} \text{Product}$$
- Oxalic acid
 - Acetaldehyde
 - Dioxane
 - Ethyl alcohol
11. The alcohol which will give carboxylic acid upon over oxidation is
- PhCH_2OH
 - $\text{PhCH}(\text{OH})\text{CH}_3$
 - $\text{PhC}(\text{OH})\text{Me}_2$
 - $\text{PhCH}(\text{OH})\text{CH}_2\text{CH}_3$
12. The alcohol which will give ketone upon oxidation with PDC is
- tertiary alcohol
 - primary alcohol
 - secondary alcohol
 - all type of alcohol
13. Nitril to aldehyde conversion can be achieved by using which of the following reagent?
- $\text{Pd}/\text{BaSO}_4, \text{H}_2$ followed by H_3O^+ workup
 - LiAlH_4 followed by H_3O^+ workup
 - DIBAL-H followed by H_3O^+ workup
 - Anhydrous AlCl_3 followed by H_3O^+ workup
14. The reagent is used in the Vilsmeier-Haack reaction is
- DMSO & PCl_5
 - DMSO & POCl_3
 - DMF & PCl_5
 - DMF & POCl_3

15. The product of Aldol reaction is a

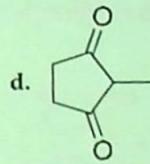
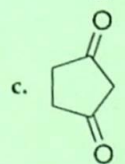
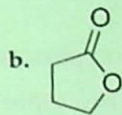
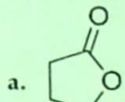
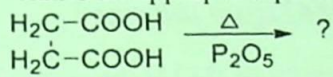
- a. saturated carbonyl
- b. α - β unsaturated carbonyl
- c. β - γ unsaturated carbonyl
- d. α -hydroxy carbonyl

16. The reagent X in the following reaction is

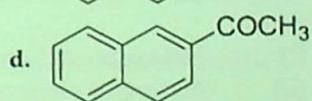
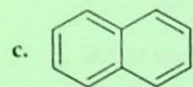
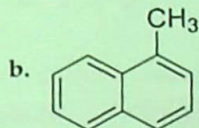
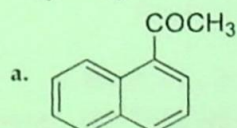
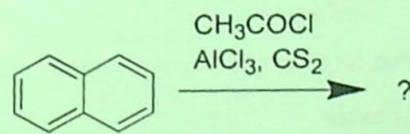


- a. X = NH₃ & NaOH
- b. X = NH₃ & NaHSO₃
- c. X = NH₃ & H₂SO₄
- d. X = NH₃ & Na₂SO₄

17. What is the appropriate product of the following reaction



18.



19. Azulene is a

- a. Non-aromatic system
- b. Ant-aromatic system
- c. Fused non-benzenoid aromatic system
- d. Fused benzenoid aromatic system

20. Naphthalene has
- a. 4 α and 4 β position
 - b. 4 α and 3 β position
 - c. 4 α and 2 β position
 - d. 3 α and 3 β position

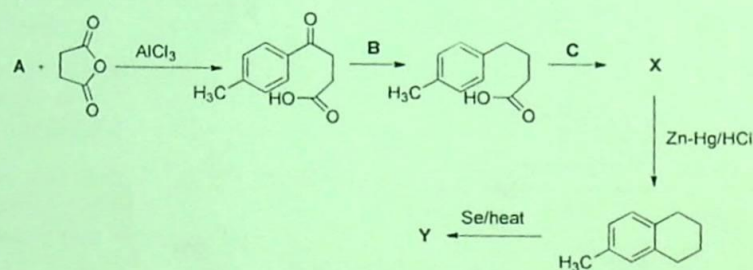
(Descriptive)

Time : 2 hrs. 30 mins.

Marks : 50

[Answer question no.1 & any four (4) from the rest]

1. a. What happens when C_2H_5MgBr is treated with (i) H_2O & (ii) CO_2 2+3+2+3
=10
- b. Write a note on pinacol pinacolone rearrangement.
- c. How to synthesize benzophenone from CO_2 ?
- d. For the following synthesis identifies the structure of A, B, C, X and Y

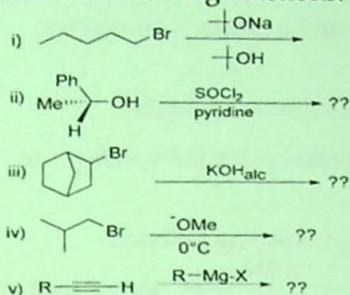


2. a. Discuss in details how the following factors affect an SN^1 reaction? 5+5=10
- (i) Structure of the substrate, (ii)
 - (ii) Nature of nucleophile
- b. Explain why nucleophilic substitution in chlorobenzene is kinetically not favorable? But progressive substitution of chlorobenzene by $-NO_2$ groups in o- and p- position of, progressively make the reaction faster.

3. a. "A strong nucleophile favour S_N2 mechanism and weak nucleophile favours an S_N1 mechanism." Justify the statement. 3+2+5
=10

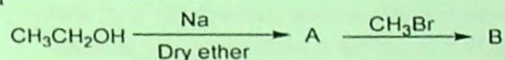
b. How can you prepare the following alkyl halide from an appropriate starting material $CH_3CH_2CH_2-Br$

c. Complete the following reactions:

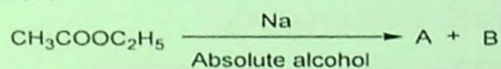


4. a. How will you prepare propan-1-ol, propan-2-ol and 2-methylpropan-2-ol starting from Grignard reagents? Explain with chemical reactions. 3+2+2+3
=10

b. Complete the following sequence of reactions and identify the products A and B



c. Write the structure and name of A and B in the following reaction.



d. What is hydroboration-oxidation of alkene? Using this reaction give the preparation of propan-1-ol starting from propene.

5. a. What are phenols? Give reasons why phenols are acidic? 3+2+3+2
=10

b. What are epoxides? Write the structure of propylene oxide and give its IUPAC name.

c. Why γ -attack by an electrophile is favourable in phenanthrene-Explain.

d. Show how could you prepare benzidine from benzene?

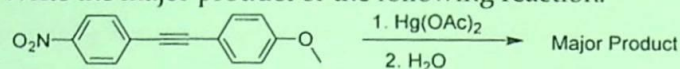
6. a. Write the Aldol product forming when acetophenone reacts with benzaldehyde. Justify your answer.
b. Write the structure of glyoxal and the product forms when it is treated with 50% NaOH (aqueous) solution. Give the reaction mechanism.
c. Give one example of enamine and explain with reaction how it can be synthesized?

4+4+2
=10

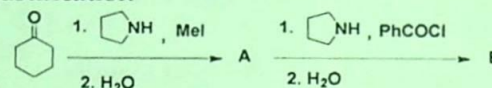
7. a. How to convert ethylbenzoate to benzaldehyde?
b. Discuss the Vilsmeier-Haack reaction for the synthesis of benzaldehyde.

2+3+2+3
= 10

c. Write the major product of the following reaction.



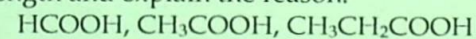
d. Identify the products A&B of the following reactions with justification



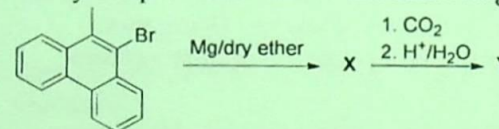
8. a. Anthracene when reacts with maleic anhydride and forms an adduct-write the full reaction mentioning the adduct.

2+2+3+3
= 10

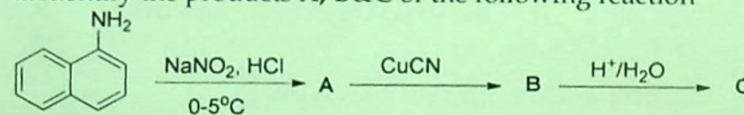
b. Arrange the following in increasing order of their acid strength and explain the reason:



c. Identify the products X&Y of the following reactions



d. Identify the products A, B&C of the following reaction



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