

B.Sc. CHEMISTRY
THIRD SEMESTER
ORGANIC CHEMISTRY II
BSC – 302 [SPECIAL REPEAT]
(USE OMR FOR OBJECTIVE PART)

**SET
A**

Duration : 3 hrs.

Full Marks : 70

Time : 30 min.

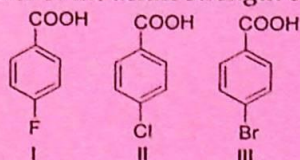
(Objective)

Marks : 20

Choose the correct answer from the following:

1X20=20

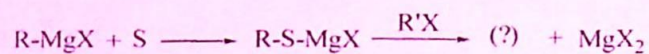
1. Benzene diazonium chloride upon reaction with aqueous solution produce
 - a. benzene
 - b. Bromobenzene
 - c. catechol
 - d. Phenol
2. Reimer-Tieman reaction proceed via the formation of
 - a. free radical
 - b. carbocation
 - c. carbanion
 - d. carbene
3. The correct order of the acidic strength of the following:



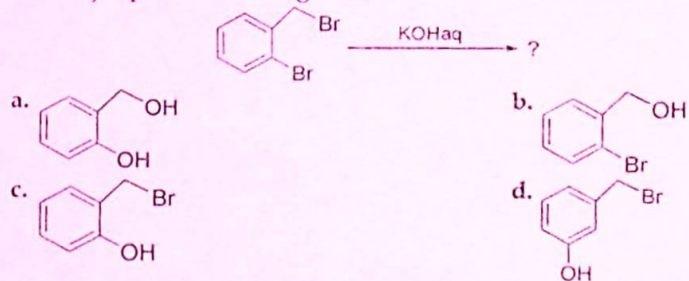
- a. I>II>III
 - b. III>I>II
 - c. III>II>I
 - d. I>III>II
4. Hoffmann Bromamide reaction convert
 - a. primary amide to a primary amine
 - b. primary amide to a primary alcohol
 - c. primary amide to an aldehyde
 - d. primary alcohol to a primary amine
 5. The substrate which can undergo Cannizzaro reaction is
 - a. Enolizable aldehyde
 - b. Non-enolizable aldehyde
 - c. Enolizable ketone
 - d. Non-enolizable ketone
 6. The intermediate compound of Aldol reaction is
 - a. α -Hydroxy ester
 - b. α -Hydroxy carbonyl
 - c. β -Hydroxy ester
 - d. β -Hydroxy carbonyl
 7. The compound which can be used as Michael acceptor is
 - a. α - β unsaturated carbonyl
 - b. β - γ unsaturated carbonyl
 - c. γ - δ unsaturated carbonyl
 - d. All of these
 8. The alcohol which does not undergo oxidation with PDC is
 - a. isopropanol
 - b. tertiary butanol
 - c. benzyl alcohol
 - d. Ethanol

9. What is the main product obtained by the oxidation of thioethers with KMnO_4
- Sulphone
 - Sulphide
 - Thioacetals
 - Sulphoxide

10. Which is the main product of the following reaction?



- Thiols
 - Thioethers
 - alkane
 - Halo acids
11. For preparation of any p-alcohol using Grignard reagent (GR), need
- GR + HCHO
 - GR + RCHO
 - GR + Ketone
 - GR + H_2O
12. An organic compound A reacts with sodium metal and forms B. On heating with conc. H_2SO_4 , A gives diethyl ether. A and B are respectively -
- $\text{C}_2\text{H}_5\text{OH}$ and $\text{C}_2\text{H}_5\text{ONa}$
 - $\text{C}_2\text{H}_5\text{OH}$ and CH_3ONa
 - $\text{C}_3\text{H}_7\text{OH}$ and $\text{C}_3\text{H}_7\text{ONa}$
 - CH_3OH and $\text{C}_2\text{H}_5\text{ONa}$
13. The major product in the given reaction



14. Which is a **not** a correct statement for an SN^2 reaction?
- Proceed with inversion of configuration
 - strong nucleophile will favour the reaction.
 - weak nucleophile will favour the reaction.
 - polar aprotic solvent favour SN^2 mechanism.
15. A and B in the following sequence of reactions are respectively
- $$\text{ROH} \xrightarrow{\text{SOCl}_2} \text{A} \xrightarrow[\text{dry ether}]{\text{Mg metal}} \text{B}$$
- ROCl and ROMg
 - RCI and RMgCl
 - RCI and RMgOCl
 - ROCl and RCl
16. Strength of the following nucleophile will be of the order:
- $\text{CH}_3\text{S}^- > \text{CH}_3\text{O}^- > \text{t-BuO}^-$
 - $\text{CH}_3\text{O}^- > \text{CH}_3\text{S}^- > \text{t-BuO}^-$
 - $\text{t-BuO}^- > \text{CH}_3\text{S}^- > \text{CH}_3\text{O}^-$
 - $\text{CH}_3\text{S}^- > \text{t-BuO}^- > \text{CH}_3\text{O}^-$

17. The example of a trihydric alcohol is
a. glyceraldehyde
b. glycerol
c. ethylene glycol
d. ethanol
18. Acetone when reacts with methyl magnesium bromide (CH_3MgBr) produce
a. 1° alcohol
b. 2° alcohol
c. 3° alcohol
d. no reaction
19. The main reagent for Hydroboration - Oxidation reaction of alkene is
a. B_2H_6
b. H_2/Pd
c. $\text{CrO}_3\text{-H}_2\text{SO}_4$
d. $\text{Hg}(\text{OAc})_2$
20. When cyclohexene is treated with mCPBA, the product is a/an
a. alcohol
b. epoxide
c. aldehyde
d. ketone
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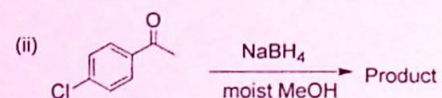
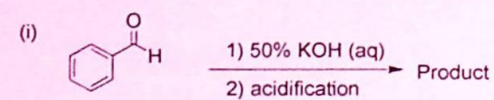
(Descriptive)

Time : 2 hrs. 30 mins.

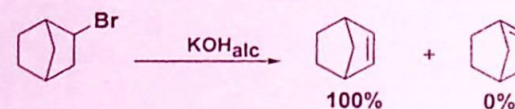
Marks : 50

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

1. a. What are the products of the given reactions? explain 3

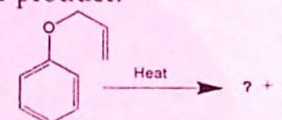


- b. Why the following reaction gives such results? 2

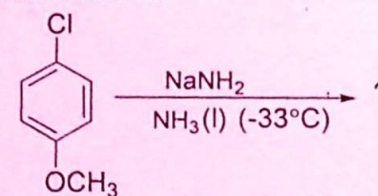


- c. i. Discuss the preparation of salicylaldehyde starting from phenol *via* Reimer-Tiemann reaction? 3

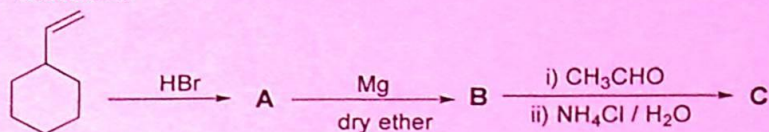
- ii. What are the products of the following reaction and which one is the major product? 2



2. a. Write down the product / products formed in the following reaction with mechanism. 3



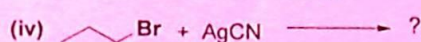
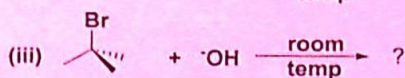
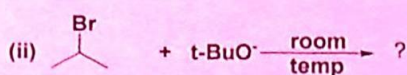
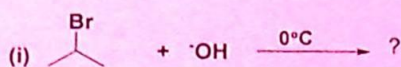
- b. Write down the products A, B and C in the following sequence of reactions 3



- c. Sketch out a strategy for synthesis of the following compounds using $\text{CH}_3\text{CH}_2\text{Br}$ 4



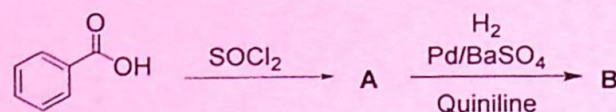
3. a. Discuss the stereochemical changes that may be observed when an optically active substrate undergoes nucleophilic substitution following $\text{S}_\text{N}1$ mechanism. 3
- b. "A strong nucleophile favour $\text{S}_\text{N}2$ mechanism and weak nucleophile favours an $\text{S}_\text{N}1$ mechanism." Justify the statement. 3
- c. Predict the products in the following reactions: 4



4. a. How will you prepare ethanol from acetaldehyde. Why is the boiling point of ethanol greater than acetaldehyde-explain schematically? 1+2=3
- b. Write down the structure of picric acid, 2-nitrophenol and 2-ethylphenol and comment which one is more acidic in nature. 2
- c. Describe Pinacol-pinacolone rearrangement. 3
- d. How can you prepare epoxide from halohydrins? Explain with a suitable example 2

5. a. Write the reagents (A & B) of the following reactions.

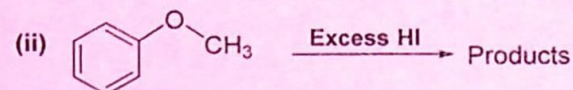
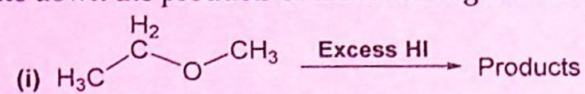
2+5+3
=10



- b. Write a short note on Cannizzaro reaction .
c. What product will be formed if CO_2 is treated with 2 equivalents of PhLi in anhydrous THF followed by acidic treatment?

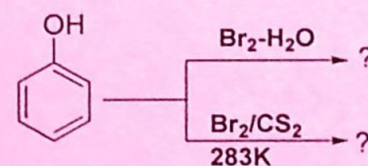
6. a. Write down the products of the following reactions

2



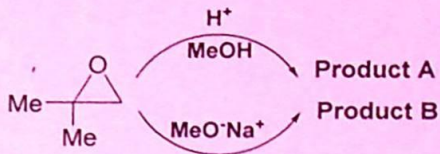
- b. Show the mechanistic pathway of Curtius Rearrangement. 3
c. Write down the structure of Maleic acid and Fumaric acid. Which one can form corresponding anhydride easily upon heating via intramolecular dehydration? Draw the structure of that anhydride. 3
d. How will you prepare Phthalic anhydride from Phthalic acid? 2

7. a. Why 4-nitrophenol has greater boiling point than 2-nitrophenol - draw the structures in support of your answer? 2
b. Describe Kolbe-Schmitt reaction and show the mechanism for the formation of salicylic acid from phenol. 3
c. Write down the products 2

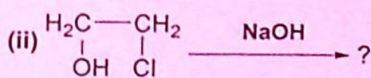
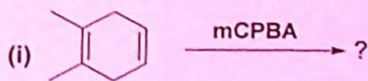


- d. Write down the short note on Fries Rearrangement with detailed mechanism? What is the role of AlCl_3 in the reaction? 3

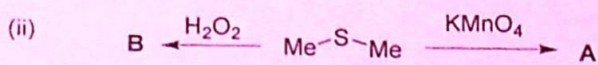
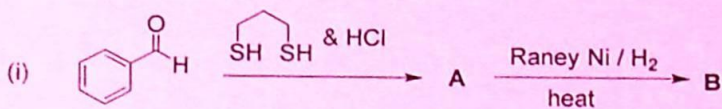
8. a. Identify 'A' & 'B'? Show most appropriate mechanistic pathway for the formation of A & B 3



- b. What will be the product of the following reaction 2



- c. Identify 'A' & 'B' of the following reactions. 3+2=5



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