

Write the following information in the first page of Answer Script before starting answer

ODD SEMESTER EXAMINATION: 2020-21

Exam ID Number _____

Course _____ Semester _____

Paper Code _____ Paper Title _____

Type of Exam: _____ (Regular/Back/Improvement)

Important Instruction for students:

1. Student should write objective and descriptive answer on plain white paper.
2. Give page number in each page starting from 1st page.
3. After completion of examination, Scan all pages, convert into a single PDF, rename the file with Class Roll No. **(2019MBA15)** and upload to the Google classroom as attachment.
4. Exam timing from 10am – 1pm (for morning shift).
5. Question Paper will be uploaded before 10 mins from the schedule time.
6. Additional 20 mins time will be given for scanning and uploading the single PDF file.
7. Student will be marked as ABSENT if failed to upload the PDF answer script due to any reason.

**B.Sc. CHEMISTRY
THIRD SEMESTER
ORGANIC CHEMISTRY-II
BSC-302**

Duration : 3 hrs.

Full Marks : 70

(PART-A : Objective)

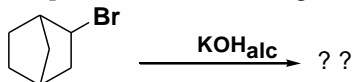
Time : 20 min.

Marks : 20

Choose the correct answer from the following:

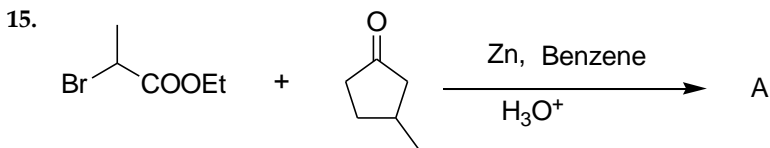
1X20=20

- Which of the following gives a 3°-alcohol by Grignard reagent (GR)?
 - Benzyl alcohol
 - Acetophenone
 - Benzonitrile
 - Benzaldehyde
- The product in the following reaction will follow:



- Sayetzev rule
 - Hofmann's rule
 - Bredt's rule
 - Markownikoff's rule
- The product 'B' in the following sequence of reactions is
$$\text{PhCH}_2\text{Br} \xrightarrow[\text{Dry ether}]{\text{Mg}} \text{A} \xrightarrow[\text{(ii) H}_2\text{O/NH}_4\text{Cl}]{\text{(i) HCHO}} \text{B}$$
 - PhCH_2OH
 - $\text{PhCH}_2\text{CH}_2\text{OH}$
 - PhCH_2COOH
 - PhCH_3
 - Which is a not a correct statement for an SN^1 reaction?
 - Proceed with inversion of configuration
 - Weak nucleophile will favour the reaction
 - Proceed with formation of an intermediate
 - Polar protic solvent favour the mechanism
 - 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:
 - CH_3OH 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 $\text{C}_3\text{H}_7\text{ONa}$
 - $\text{C}_2\text{H}_5\text{OH}$ and $\text{C}_2\text{H}_5\text{ONa}$
 - Tartaric acid when treated with Fenton's reagent ($\text{H}_2\text{O}_2 + \text{FeSO}_4$) gives:
 - Dihydroxy fumaric acid
 - Oxalic acid
 - Tartronic acid
 - Fumaric acid
 - Conversion of carboxylic acid into primary amine takes place by:
 - Curtius reaction
 - Hunsdiecker reaction
 - Kolbe's electrolysis
 - None of these
 - Amides on reduction with LiAlH_4 , yields:
 - Nitriles
 - 1° amine
 - 2° amine
 - Isonitrile
 - Which one of the following is the best acylating agent?
 - CH_3COCl
 - CH_3COOR
 - $(\text{CH}_3\text{CO})_2\text{O}$
 - CH_3CONH_2

10. The intramolecular condensation of two ester groups belonging to the same molecule is known as:
- Claisen condensation
 - Hofmann degradation
 - Dieckmann condensation
 - Reformatsky reaction
11. Phenyl acetate when heated with AlCl_3 gives ortho- and para-hydroxy acetophenone. This reaction is known as:
- Allyl rearrangement
 - Fries rearrangement
 - Hofmann rearrangement
 - Claisen rearrangement
12. Claisen rearrangement is a:
- 1,3-sigmatropic rearrangement
 - 3,3-sigmatropic rearrangement
 - 3,5-sigmatropic rearrangement
 - None of these
13. The number of optically active isomers in tartaric acid is:
- 1
 - 2
 - 3
 - 4
14. The oxidative cleavage of glycol takes place in presence of:
- H_2CrO_4
 - $\text{Pb}(\text{OAc})_4$
 - $\text{C}_2\text{H}_5\text{ONa}$
 - LiAlH_4

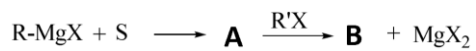


Product (A) formed in the given reaction is:

-
-
-
-

16. The final product of Aldol reaction is:
- saturated carbonyl
 - $\beta\gamma$ -unsaturated carbonyl
 - $\gamma\delta$ -unsaturated carbonyl
 - $\alpha\beta$ -unsaturated carbonyl
17. Which of the following can be used as Michael acceptor?
- -
 -
 -
18. The alcohol which gives ketone upon oxidation with PDC is:
- Tertiary butanol
 - Isopropanol
 - Ethanol
 - Benzyl alcohol
19. The reaction of Et_2S with KMnO_4 gives product as:
- Sulphone
 - Sulphide
 - Sulphoxide
 - Thioacetals

20. The product 'B' of the following reaction will be?



a. Thiols

b. Alkane

c. Halo acids

d. Thioethers

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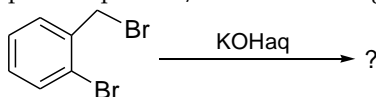
(PART-B : Descriptive)

Time : 2 hrs. 40 min.

Marks : 50

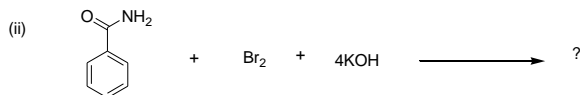
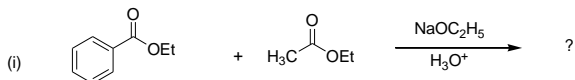
[Answer question no.1 & any four (4) from the rest]

1. a) Discuss the effect of substituents on the acid strength of aromatic carboxylic acids. 2
b) How the substituent effects on the acidity of phenol? Discuss. 2
c) Write down the possible product/s in the following reactions: 3



- d) How to do the following transformation reactions? Show reaction mechanism. 3

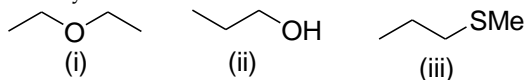
2. a) Among the ortho, meta and para substituted benzoic acids which one is most acidic? Explain. 2
b) Discuss acid hydrolysis of ester with example. 3
c) Write the major products of the following reactions with suitable mechanisms: 5



3. a) What do you mean by nucleophilic acyl substitution reaction? How this reaction is applied in the preparation of different derivatives of carboxylic acids? Explain with examples. 5
b) What is Arndt Eistert reaction? Explain with suitable chemical reaction. 3
c) Compare the reactivity of the following acid derivatives towards nucleophilic acyl substitution reaction in increasing order: Anhydrides, amides, acid chlorides, esters, carboxylate 2

4. a) What are ambident nucleophiles? Explain why Alkyl halide when treated with KCN give Alkyl nitrile, while with AgCN give alkyl isocyanide? 2.5

b) How can you prepare the following compounds using appropriate Alkyl halide? 4.5



c) Discuss the stereo chemistry of SN¹ reactions. 3

5. a) Write the structure of 'A' and show the mechanism of the following reaction: 3

b) Identify 'A' & 'B' of the following reactions: 2

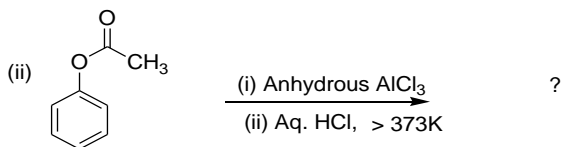
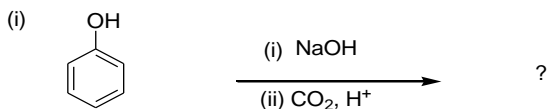
c) Write the reagents (A & B) of the following reactions and show the reaction mechanisms. 5

6. a) Explain with suitable example, how 1^o, 2^o and 3^o alcohols react with chromic acid (H₂CrO₄) to give different oxidation products. 3

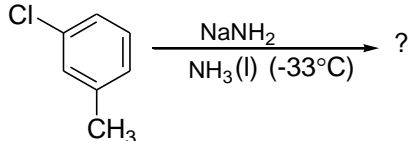
b) Explain why phenols are found to be more acidic than alcohols? 2

c) What is Claisen rearrangement? Explain with examples. 3

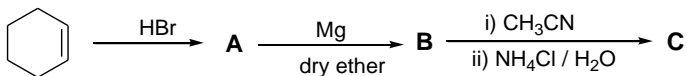
d) What are the products formed in the following reactions: 2



7. 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:



4

- c) Sketch out a strategy for synthesis of the following compounds using CH_3MgBr

(i) t-butyl alcohol (ii) Ethyl methyl ketone

8. a) Identify 'A' & 'B' of the following reactions with justification.

4+3=7

- b) Write the final products of the following reaction and show the mechanism.

3

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