

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

**SET
A**

Duration: 3 hrs.

Full Marks: 70

Time: 30 min.

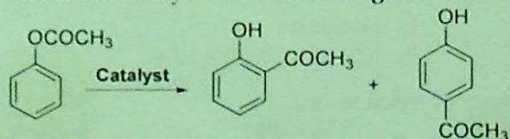
Marks: 20

(Objective)

1×20=20

Choose the correct answer from the following:

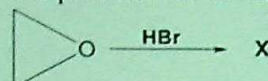
- Rosenmund reduction of acyl chloride will produce
 - alcohol
 - aldehyde
 - ketone
 - hydrocarbon
- The essential requirement for Aldol reaction is the substrate must be carbonyl compound having
 - α -H
 - β -H
 - γ -H
 - δ -H
- The reaction between benzaldehyde and hydroxyl amine gives a
 - hydrazone
 - semicarbazone
 - ketoxime
 - aldoxime
- Which one of the following is the substrate for the Beckmann reaction?
 - aldehyde
 - oxime
 - amide
 - ketone
- The intermediate species of the Hoffmann rearrangement is
 - Amine
 - amide
 - isocyanate
 - ketone
- If formaldehyde is treated with CH_3MgBr and the product is hydrolysed then which of the following products is obtained?
 - Propan-2-ol
 - Propan-1-ol
 - 2-Methylpropan-2-ol
 - Ethanol
- Name the catalyst in the following Fries rearrangement reaction



- AlCl_3
- FeCl_3
- NaCl
- NaOH

- Oc1ccccc1
 $\xrightarrow{\text{Reagents}}$
OC(=O)c1ccccc1O

9. The product X in the following reaction is



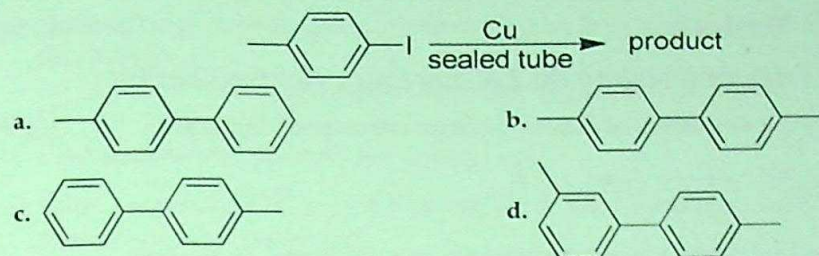
- $$\text{ROH} \xrightarrow{\text{PBr}_3} \text{A} \xrightarrow{\text{AgCN}} \text{B}$$

-

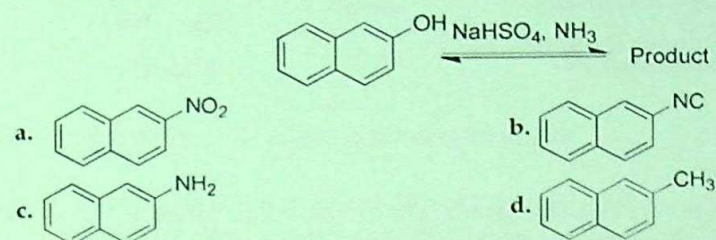
- $$\text{C}_2\text{H}_5\text{OH} \xrightarrow{\text{HBr}} \text{A} \xrightarrow[\text{Dry ether}]{\text{Mg}} \text{B} \xrightarrow[\text{ii) H}_2\text{O/NH}_4\text{Cl}]{\text{i) HCHO}} \text{C}$$

- USTM/COE/R-01

16. Choose the correct product of the following reaction



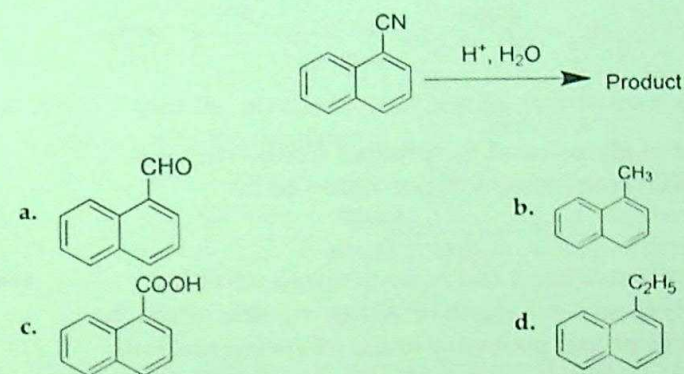
17. Write down the correct product of the following reaction



18. Anthracene-an aromatic compound with

- a. 16 π e b. 24 π e
 c. 8 π e d. 14 π e

19. The product of the following reaction is



20. Phenanthrene is

- a. A polycyclic aromatic hydrocarbon
 b. Composed of three fused benzene rings
 c. A non-linear aromatic system
 d. All of the above

(Descriptive)

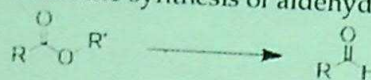
Time : 2 hrs. 30 mins.

Marks : 50

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

1. a. Discuss the synthesis of aldehyde from corresponding ester.

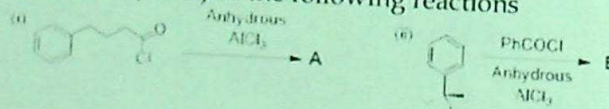
2+3+2+3
= 10



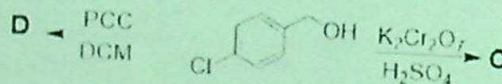
- b. Explain Lucas test to distinguish between 1°, 2° and 3° alcohols.
c. Find the ambident nucleophile among "RNH₂, CN, RSH, AlCl₃, CH₂COR & NO₂" and justify.
d. How will you convert the following

2. a. Write a short note on Friedel-Crafts acylation reaction. Identify the products (A&B) of the following reactions

4+2+4
= 10

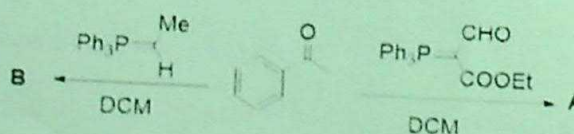


- b. Write the structure of the products (C&D) of the following reactions.



- c. Write the structure of glyoxal and the product forms when it is treated with 50% KOH (aqueous) solution followed by acidification.
3. a. Give the example of a stabilized and non-stabilized phosphor ylides. Depict the general mechanism of Wittig reaction. Write the products (A&B) with proper geometry of the following reaction?

6+4=10



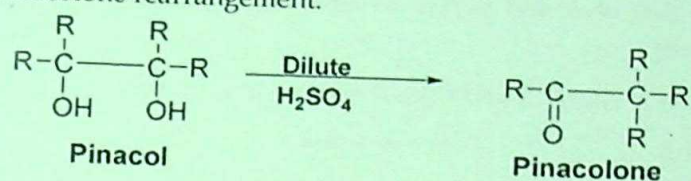
b. Discuss the Beckmann rearrangement with suitable example.

4. a. Starting from appropriate Grignard reagent how will prepare the following?
 (i) Ethanol (ii) Propan-2-ol and (ii) 2-methylpropan-2-ol

3+2+3+2
=10

b. Give reason why phenols are acidic.

c. What are pinacols? Give the mechanism of the following pinacol-pinacolone rearrangement.

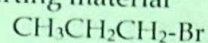


d. Write a note on Bouveault-Blanc reduction.

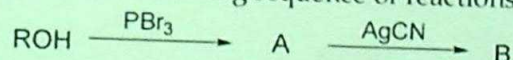
5. a. Discuss mechanism and kinetics of a general $\text{S}_\text{N}2$ reaction. Indicate the energy profile of the reaction.

5+3+2
=10

b. How can you prepare the following alkyl halide from an appropriate starting material

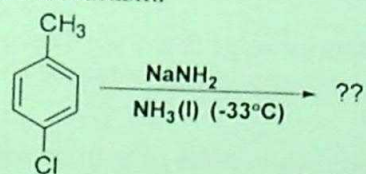


c. A and B in the following sequence of reactions are respectively



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

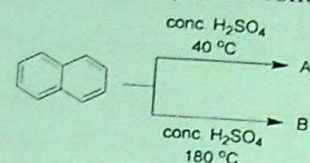
3+4+3
=10



b. What happens when $\text{C}_2\text{H}_5\text{MgBr}$ is treated with
 (i) CO_2 (ii) CH_3CHO ,
 write down the products with mechanism

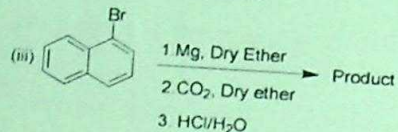
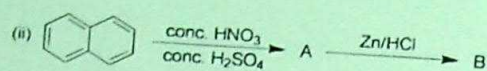
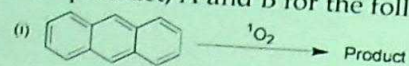
c. Discuss the stereo chemistry of $\text{S}_\text{N}2$ reactions.

7. a. What are the products (A and B) of the following reaction

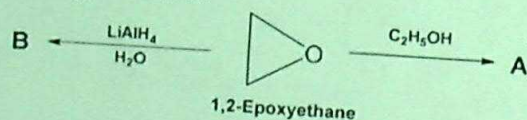


- b. γ -position in phenanthrene is favoured by electrophile as compared to that of α and β position: Explain on the basis of resonance energy.

- c. Write down the product, A and B for the following reaction:



8. a. What is Reimer Tiemann reaction? Explain its mechanism.
b. What are epoxides? Identify the products A and B in the following reactions.



- c. Explain on the basis of resonance energy that γ position in phenanthrene is favoured by electrophile as compared to that of α and β position.

- d. Arrange the following compounds in order of their increasing acid strength and give proper reason

- i) CH_3COOH , CF_3COOH , CCl_3COOH , CBr_3COOH
ii) HCOOH , CH_3COOH , $\text{C}_2\text{H}_5\text{COOH}$

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