

**B.Sc. CHEMISTRY
FOURTH SEMESTER
ORGANIC CHEMISTRY-III
BSC – 941 IDMJ [REPEAT]
[USE OMR FOR OBJECTIVE PART]**

**SET
A**

Duration: 3 hrs.

Full Marks: 70

Time: 30 min.

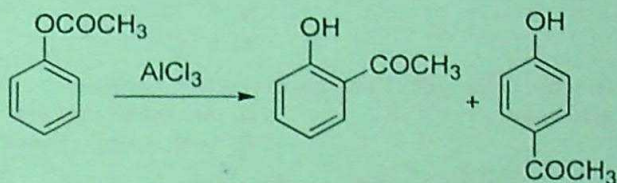
Marks: 20

(Objective)

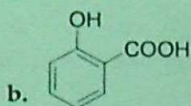
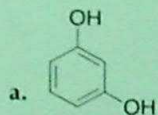
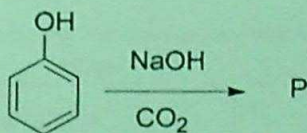
Choose the correct answer from the following:

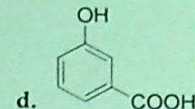
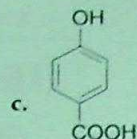
1×20=20

1. If acetaldehyde is treated with CH_3MgBr and the product is hydrolysed then which of the following products is obtained?
 - a. Ethanol
 - b. Propan-1-ol
 - c. Propan-2-ol
 - d. 2-methylpropan-2-ol
2. If vapours of propan-2-ol is passed over red-hot Cu at 300°C the product obtained is
 - a. Propanone
 - b. Butanone
 - c. Propane
 - d. Propene
3. The name of the following reaction is



- a. Kolbe's Schmidt reaction
 - b. Reimer Tiemann reaction
 - c. Fries rearrangement
 - d. Claisen rearrangement
4. The product P in the following reaction is

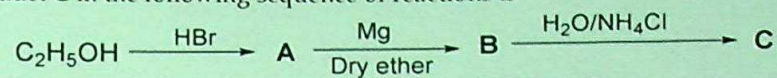




5. If ethene is treated with cold, dilute and alkaline KMnO_4 solution, the product obtained is
 - a. Ethyl alcohol
 - b. Ethylene glycol
 - c. Acetaldehyde
 - d. Acetone
6. Primary alcohol upon over oxidation will be converted to
 - a. Ketone
 - b. Ester
 - c. Aldehyde
 - d. Carbohydrate
7. Ozonolysis of ethylene under the treatment of H_2O_2 will be generating
 - a. Ethanoic acid
 - b. Formic acid
 - c. Formaldehyde
 - d. Acetaldehyde
8. The reaction between acetone and hydroxyl amine gives a
 - a. Hydrazone
 - b. Semicarbazone
 - c. Ketoxime
 - d. Aldoxime
9. The aldehyde that reacts and gives most stable compound with water is
 - a. CH_3CHO
 - b. CCl_3CHO
 - c. PhCHO
 - d. Cl_3CHO
10. Benzaldehyde when undergoes Cannizzaro reaction produces
 - a. Benzoic acid only
 - b. Benzyl alcohol only
 - c. Toluene
 - d. both Benzyl alcohol & Benzoic acid
11. Which is a **not** a correct statement for an $\text{S}_\text{N}1$ reaction?
 - a. Proceed with inversion of configuration
 - b. weak nucleophile will favour the reaction.
 - c. proceed with formation an intermediate.
 - d. polar protic solvent favour the mechanism.
12. A and B in the following sequence of reactions are respectively

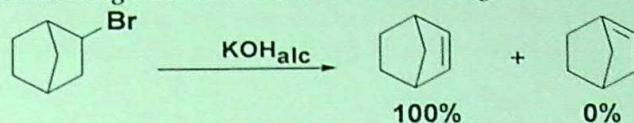
$$\text{ROH} \xrightarrow{\text{PBr}_3} \text{A} \xrightarrow{\text{AgCN}} \text{B}$$
 - a. RBr and RCN
 - b. RBr and RNC
 - c. ROBr and RNC
 - d. ROBr and RCN
13. For preparation of any s-alcohol using Grignard reagent (GR), need
 - a. $\text{GR} + \text{HCHO}$
 - b. $\text{GR} + \text{RCHO}$
 - c. $\text{GR} + \text{Ketone}$
 - d. $\text{GR} + \text{H}_2\text{O}$

14. The product C in the following sequence of reactions is



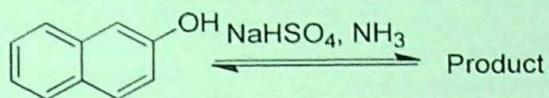
- a. $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ b. $\text{CH}_3\text{CH}_2\text{CHO}$
c. $\text{CH}_3\text{CH}_2\text{COOH}$ d. CH_3CH_3

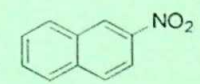
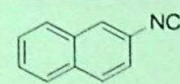
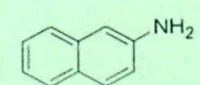
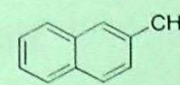
15. The product in the following elimination reaction is following



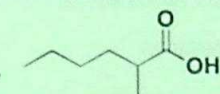
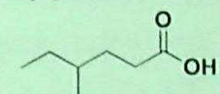
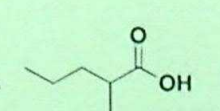
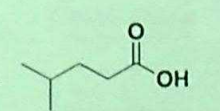
- a. Sayetzev rule b. Hoffman's rule
c. Bredt's rule d. Markownikoff's rule

16. Write down the correct product of the following reaction



- a.  b. 
c.  d. 

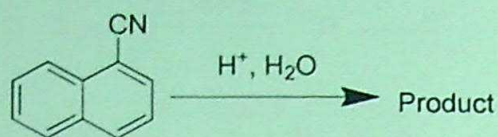
17. Which structure is the correct structure of 2-Methylpentanoic acid is

- a.  b. 
c.  d. 

18. Naphthalene has

- a. 2α and 4β position b. 4α and 2β position
c. 4α and 4β position d. 2α and 2β position

19. The product of the following reaction is



- a.
- b.
- c.
- d.

20. Phenanthrene is

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

(**Descriptive**)

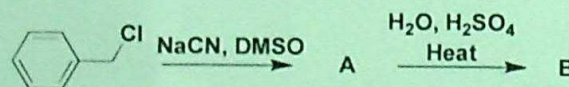
Time : 2 hrs. 30 mins.

Marks : 50

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

1. a. Write down the products A and B of the following reaction

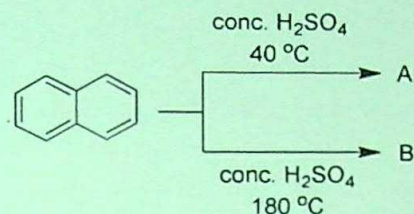
3+2+3+2
=10



- b. The ambident nucleophile among RNH_2 , CN^- , RSH , AlCl_3 , CH_2COR & NO_2^- is/are
- c. What is Bouveault Blanc reduction? Give its mechanism.
- d. Discuss the general condensation reaction of carbonyl compound

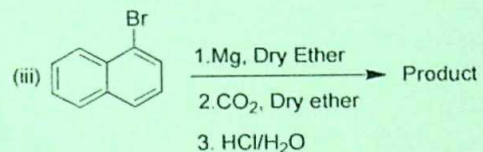
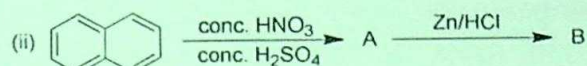
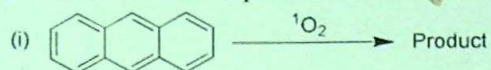
2. a. What are the products (A and B) of the following reaction

2+2+6
=10



- 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:

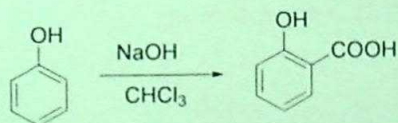


3. a. Starting from CH_3MgBr how will prepare the following? i) Propan-1-ol and ii) Propan-2-ol

2+3+3+2
=10

- b. What are phenols? Give reason why phenols are acidic.

- c. Discuss the mechanism of the following reaction.



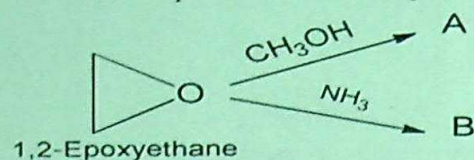
- d. How will you distinguish between 1° and 2° alcohols by Lucas test? Explain.

4. a. Give the conversions of the following:

2+3+5
=10

- Ethene to ethylene glycol and
- Ethylene glycol to dioxane

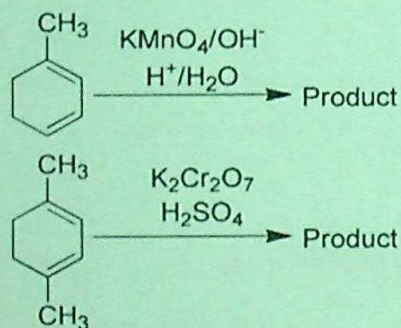
b. What are epoxides? Write the products in the following reactions.



c. Arrange the following compounds in order of their increasing acid strength

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

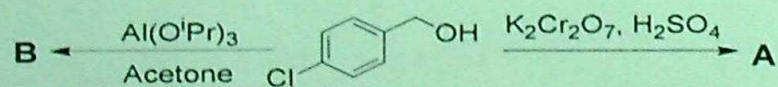
d. What will be the product of the following reactions



5. a. If a secondary alcohol is treated with $\text{K}_2\text{Cr}_2\text{O}_7$ in the presence of dilute H_2SO_4 what product will be formed? Show the mechanism.

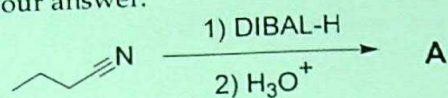
4+2+4
=10

b. Write the structure of the products(A&B) of the following reactions.

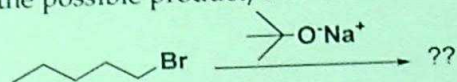


c. Write a short note on ozonolysis reaction.

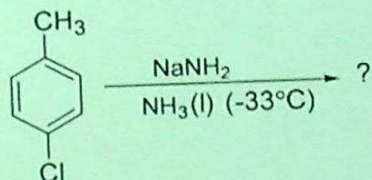
6. a. What is DIBAL-H? Identify the product 'A' of the following reaction
your answer. 5+3+2
=10



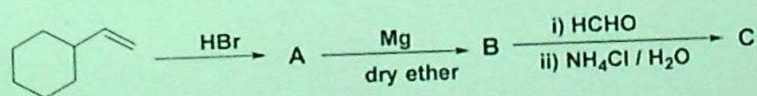
- b. Discuss the Friedel Crafts acylation reaction.
c. How to make a ketone from organic nitrile?
7. a. How can you prepare the following alkyl halide from an appropriate starting material CH3CH2CH2Br 2+3+3+2
=10
b. Discuss mechanism and kinetics of a general $\text{S}_\text{N}1$ reaction. Indicate the energy profile of the reaction.
c. "A strong nucleophile favours $\text{S}_\text{N}2$ mechanism and weak nucleophile favours an $\text{S}_\text{N}1$ mechanism." Justify the statement.
d. Write down the possible product/s in the following reaction:



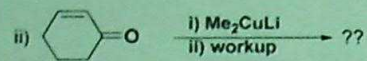
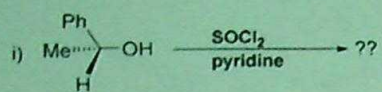
8. a. Write down the product / products formed in the following reaction with mechanism. 3+3+4
=10



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



c. Write down the products formed in the following reactions.



= = *** = =