

**B.SC. CHEMISTRY
FIRST SEMESTER
ORGANIC CHEMISTRY I
BSC – 101 IDMj**

**SET
A**

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs.

Full Marks: 70

Time: 30 min.

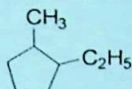
(Objective)

Marks: 20







Choose the correct answer from the following:

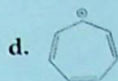
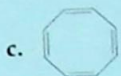
1X20=20

1. The IUPAC name of the following organic compound is

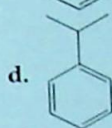
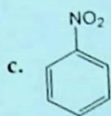
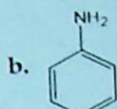
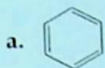


- a. 1-Ethyl-2-methylcyclopentane b. 1-Methyl-2-ethylcyclopentane
c. 2-Ethyl-1-methylcyclopentane d. 1-Ethyl-2-methylcyclohexane
2. The following organic compound belongs to
-
- C1=CC=NC=C1
- a. Aliphatic b. Alicyclic
c. Heterocyclic d. Homocyclic
3. The hybridization of C-atom in the ethyne molecule is
- a. sp^3 b. sp^2
c. sp^3d d. sp
4. The effect that causes polarity due to movement of π -electrons in presence of attacking reagent is called
- a. Inductive effect b. Electromeric effect
c. Mesomeric effect d. Hyperconjugation
5. The order of stability of carbocations is
- a. primary > secondary > tertiary b. primary > tertiary > secondary
c. tertiary > secondary > primary d. secondary > primary > tertiary
6. Which of the following is the correct order of bond energy:
- a. $C-C < C=C < C\equiv C$ b. $C-C > C=C > C\equiv C$
c. $C=C < C\equiv C < C-C$ d. $C\equiv C > C-C > C=C$
7. Which of the following species is formed by hemolytic fission?
- a. Carbocation b. Carbocation
c. Free radical d. None of these

8. Strong base is preferred by
- E-1 elimination reaction
 - E-2 elimination reaction
 - Both (a) and (b)
 - None of these
9. According to Saytzeff's rule the major product will be:
- More substituted alkene
 - More substituted alkyne
 - Least substituted alkene
 - Least substituted alkyne
10. The ease of dehydrohalogenation of alkyl halide is:
- $3^\circ > 2^\circ > 1^\circ$
 - $1^\circ > 2^\circ > 3^\circ$
 - $2^\circ > 3^\circ > 1^\circ$
 - $3^\circ > 1^\circ > 2^\circ$
11. Markonikov reaction is the example of
- Electrophilic substitution reaction
 - Nucleophilic substitution reaction
 - Electrophilic addition reaction
 - Nucleophilic addition reaction
12. Optical isomers that are not mirror images are called
- Enantiomers
 - Tautomers
 - Diastereomers
 - Metamers
13. Which of the following compound will show cis-trans isomerism?
- Butane
 - 2-Butene
 - Acetone
 - Cyclopropane
14. Most stable conformation of Cyclohexane
- Haworth form
 - Boat Form
 - Newmann form
 - Chair form
15. Cyclohexane shows
- Configurational Isomerism
 - Conformational Isomerism
 - Constitutional isomerism
 - None of the above
16. The role of FeCl_3 in halogenations of benzene to generate
- Cl_2
 - Cl
 - Cl^+
 - Cl^-
17. Which one is the electrophile for Friedel-Crafts acylation reaction
- Carbanion
 - Acylium ion
 - Carbocation
 - Carbene
18. Which one of the following is Aromatic?
- 
 - 
 - 
 - 
19. Which one of the following is Antiaromatic
- 
 - 



20. Which one of the following is more reactive towards electrophilic aromatic substitution



(Descriptive)

Time : 2 hrs. 30 min.

Marks : 50

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

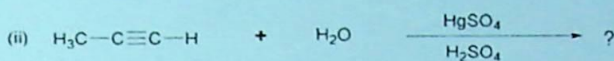
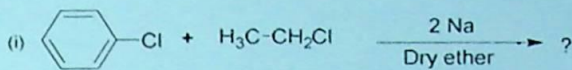
1. a. Discuss the formation of methane molecule with its orbital diagram using the concept of hybridization. 3+3+2+3
=10
b. Write a note on E-2 elimination reaction.
c. Why Aniline cannot undergo Friedel-craft reactions?
d. What is Racemic mixture? Explain

2. a. What is inductive effect? Explain why chloroacetic acid is more acidic than acetic acid. 3+2+3+2
=10
b. Explain dipole moment with examples.
c. What is hydrogen bonding? Explain the different types of hydrogen bonding.
d. Illustrate homolytic and heterolytic fission.

3. a. Write the major and minor products formed when HCl is added to propene. State the rule based on which these different products are obtained. 3+2+3+2
=10
b. What are organic acids and bases?
c. State Markonikov's rule. Give suitable example.
d. Write a short note on Diels-Alder reaction.

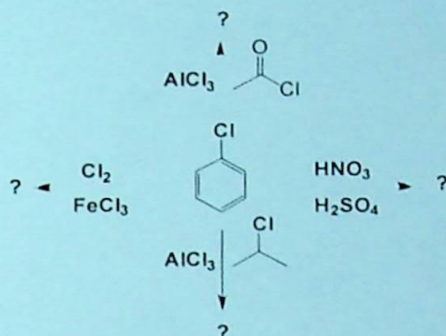
4. a. Why -OH group an ortho, para director that activates a benzene ring? Explain in details with resonance structure. 3+2+3+2
=10
b. Why halogens are ortho- para directing group though it is deactivating?
c. What is Annulene? Write the structure of 8-annulene and comment whether it is aromatic, antiaromatic or nonaromatic.
d. Write the synthetic route of Nitration of Benzene and Give mechanism.

5. a. What is allylic bromination? Give example. Discuss the factors affecting the rate of E-2 elimination reaction. Write down the ways by which propene can be prepared. 5+5=10
b. Write the major products of the following reaction with mechanism.



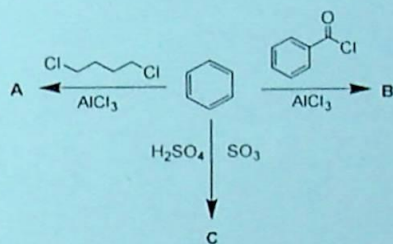
6. Write the major products with justification of the following reactions?

10

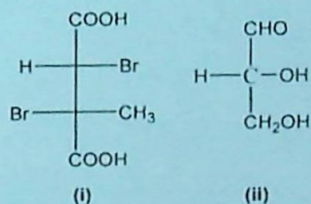


7. a. Write the product A, B and C of the following reactions and Give mechanism.

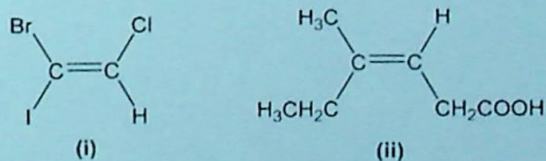
5+3+2
=10



b. Assign 'R' or 'S' configuration of the following Compounds



c. Assign 'E' or 'Z' configuration to each of the following compounds



8. a. Define Enantiomers and Diastereomers? Give examples.
b. Write a note on Meso compound.
c. Write a note on Optical isomerism of Lactic acid.

5+2+3
=10

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