

**B.SC. CHEMISTRY**  
**FIRST SEMESTER**  
**ORGANIC CHEMISTRY-I**  
**BSC - 101 IDMJ**  
[USE OMR FOR OBJECTIVE PART]

**SET**  
**A**

Duration: 3 hrs.

Full Marks: 70





Time: 30 min.

**(Objective)**

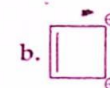
Marks: 20

*Choose the correct answer from the following:*

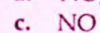
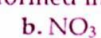
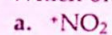
**1×20=20**

- Which among the following is not an example of Acyclic compound  
a. Acetaldehyde  
b. Ethane  
c. Cyclopropane  
d. Isobutane
- Which among the following is not an example of alicyclic compound  
a. Cyclohexane  
b. Cyclohexene  
c. Tetrahydrofuran  
d. Acetic Acid
- The hybridization of C-C single bond of  $\text{HC}\equiv\text{C}-\underset{\text{H}}{\text{C}}=\text{CH}_2$  is  
a.  $sp^3-sp^3$   
b.  $sp-sp^2$   
c.  $sp-sp$   
d.  $sp^3-sp$
- Ions are formed from the neutral atoms by  
a. Loss of electrons  
b. Gain of electrons  
c. Sharing of electrons  
d. Both a and b
- Bond angle of  $sp$  hybridization is  
a.  $180^\circ$   
b.  $90^\circ$   
c.  $120^\circ$   
d.  $109.28^\circ$
- Electronegativity is defined as the power of an atom in a molecule to  
a. Repel electrons towards itself  
b. Attract electrons towards itself  
c. Expand itself  
d. None of the above
- Which one the following is the electrophile for Friedel-Crafts alkylation reaction  
a. Carbocation  
b. Carbanion  
c. Carbene  
d. Nitrene
- The role of ferric chloride in chlorination of benzene to generate  
a.  $\text{Cl}_2$   
b.  $\text{Cl}^-$   
c.  $\text{Cl}^+$   
d.  $\text{Cl}$
- Which one of the following is Antiaromatic  
a.   
b.   
c.   
d. 

10. Which one of the following is Aromatic



11. Which one of the following is electrophile formed in nitration of benzene



12. No. of  $\pi$  electrons for aromatic compounds is

a.  $4n$

b.  $4n^2$

c.  $4n + 2$

d.  $4n + 4$

13. 4-annulene is

a. Aromatic

b. antiaromatic

c. Non aromatic

d. None

14. The order of alkyl halide for  $\text{E}_2$  elimination reaction is a

a.  $3^\circ > 2^\circ > 1^\circ$

b.  $2^\circ > 3^\circ > 1^\circ$

c.  $1^\circ > 2^\circ > 3^\circ$

d.  $3^\circ > 1^\circ > 2^\circ$

15.  $\text{E}_1$  elimination mechanism follows:

a. One step

b. Two steps

c. Three steps

d. Four steps

16. The ease of dehydration of alcohols for the formation of alkene is

a.  $1^\circ > 2^\circ > 3^\circ$

b.  $3^\circ > 2^\circ > 1^\circ$

c.  $2^\circ > 3^\circ > 1^\circ$

d.  $3^\circ > 1^\circ > 2^\circ$

17. Frankland reaction use the metal

a. Na

b. Li

c. Zn

d. Cu

18. Optical isomers that are not mirror images is called

a. Enantiomers

b. Diastereomers

c. Stereoisomers

d. None of the above

19.  $\text{E}_1$  and  $\text{E}_2$  elimination reaction can be distinguished by which of the following characteristics

a. Base used

b. Leaving group

c. Both base and leaving group

d. None of the above

20. Which one of the following statements is false about enantiomers?

a. Rotate plane polarized light.

b. Are superimposable mirror image

c. Are non-superimposable mirror image

d. Have the same melting point.

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**( Descriptive )**

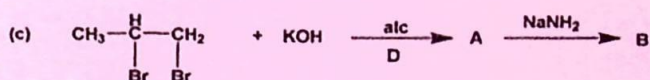
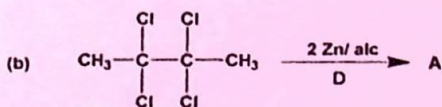
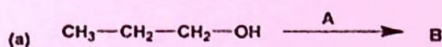
Time : 2 hrs. 30 min.

Marks : 50

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

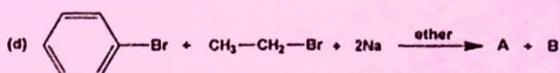
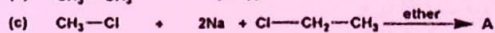
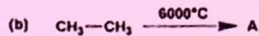
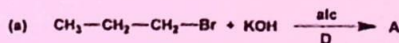
1. a. What is the hybridization of ethene? Explain with an orbital diagram. 2
- b. Define hybridization. What is the bond angle of  $sp^3$  hybridization? 2
- c. Write a note on  $E_1$  elimination reaction. 3
- d. Write the Huckel's rule of aromaticity and antiaromaticity. 3
2. a. How are alkanes prepared? Define saytzeff's rule. Give proper example. Draw the energy profile diagram of  $E_2$  and  $E_{1cb}$  elimination reaction. 2+2+2=6

b. Complete the following reaction: 4

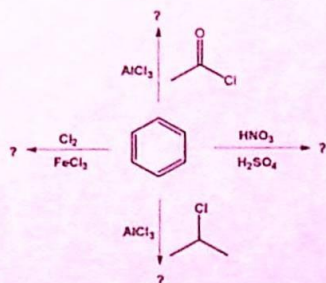


3. a. Define Wurtz reaction. Give example. Write down the mechanism involved in free radical substitution reaction. 2+2=4

b. Complete the following reaction 6



4. a. What are the rules for resonance? Explain the stability of resonating structures. 4  
 b. Explain the application of inductive effect. How does Curly arrow work? Give an example of heterolytic fission. 3+3=6
5. a. Write a short note on importance of electronic displacement. What is mesomeric effect? Explain +M and -M effect. 3+3=6  
 b. What is permanent electronic displacement? What are its types? Define electromeric displacement. 2+2=4
6. a. What is Annulene? Write the structure of 10-annulene and 6-annulene and comment whether it is aromatic, antiaromatic or nonaromatic. 4  
 b. Write the synthetic route of Chlorobenzene and Give mechanism. 3  
 c. Define an electrophile. Why Benzene undergoes electrophilic aromatic substitution reaction. 3
7. a. Define Enantiomers and Diastereomers? Give examples 5+5=10  
 b. What is a Meso compound give examples. Write notes on Optical isomerism of Lactic acid.
8. a. Write the products of the following reactions 5



- b. Applying Huckel's rule Comment on following molecules whether it is aromatic, antiaromatic or non-aromatic. 5

