2024/12

SET A

B.SC. CHEMISTRY
FIRST SEMESTER
ORGANIC CHEMISTRY-I
BSC – 911 IDMJ

[USE OMR FOR OBJECTIVE PART]

Duration: 3 hrs. **Full Marks: 70**

Objective

Time: 30 min. **Marks: 20**

Choose the correct answer from the following: ***1×20=20***

1. Bond angle of *sp* hybridization is
   a. 180° b. 90°
   c. 120° d. 109.5°

2. The phenomenon of forming completely new set of equivalent orbitals by intermixing of atomic orbitals is known as:
   a. Allocaion b. Hybridization
   c. Chemical bond formation d. Electronic configuration

3. The orbital that are resulted from sp hybridization have_____% s-character and _____% p-character.
   a. 25, 75 b. 75, 25
   c. 20, 80 d. 50, 50

4. Which of the following is not a method of electron movement
   a. Bond breaking b. Bond making
   c. Bond movement d. Revolution of bond

5. Which species are formed due to homolytic fission
   a. Anion b. Cation
   c. Free radical d. Atom

6. Which of the following is not a permanent electronic displacement effect?
   a. Inductive effect b. Resonance effect
   c. Electromeric effect d. Hyper conjugation

7. Markovnikov rule is applicable to
   a. Symmetrical alkenes b. Unsymmetrical alkenes
   c. Both a and b d. None of the above

8. What is the IUPAC name of $CH_3CH{=}CH{-}CH_3$
   a. But-2-ene b. 1-Methyl-But-2-ene
   c. But-3-ene d. Isobutene

9. Which one of the following is Antiaromatic

a. 
b. 
c. 
d. 

10. Which one of the following is Aromatic

a. 
b. 
c. 
d. 

11. Which of the following is electrophile formed in Friedel Craft Acylation
    a. Carbocation
    b. Carbanion
    c. Acyl ion
    d. Carbene

12. Number of pi electrons for Anti aromatic compounds is
    a. 4n
    b. $4n^2$
    c. 4n + 2
    d. 4n+ 4

13. 8-annulene is
    a. Aromatic
    b. antiaromatic
    c. Non aromatic
    d. None

14. The order of alkyl halide for E_2 elimination reaction is a
    a. $1^o>2^o>3^o$
    b. $2^o>3^o>1^o$
    c. $3^o>2^o>1^o$
    d. $3^o>1^o>2^o$

15. Strong base is preferred by
    a. E_1 elimination reaction
    b. E_2 elimination reaction
    c. Both (a) and (b)
    d. None of these

16. The ease of dehydrohalogenation of alkyl halide is
    a. $1^o>2^o>3^o$
    b. $2^o>3^o>1^o$
    c. $3^o>2^o>1^o$
    d. $3^o>1^o>2^o$

17. Frankland reaction uses 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. The order of boiling point for the following alkanes in increasing order is
    a. n-pentane > iso-pentane > neo-pentane
    b. iso-pentane > neo-pentane > n-pentane
    c. neo-pentane > iso-pentane > n-pentane
    d. n-pentane > neo-pentane > is-pentane

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

a. Rotate plane polarized light.
b. Are superimpossible mirror image
c. Are non superimpossible 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. Define hybridization. What is the hybridization of carbon atom in ethene? Explain the formation of ethene with an orbital diagram. 4+3+3 =10

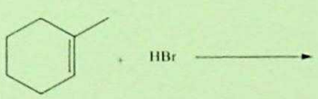
   b. Define an electrophile. Why Benzene undergoes electrophilic aromatic substitution reaction.

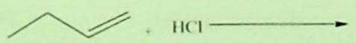
   c. Write a note on E_1 elimination reaction

2. a. State and explain Markovnikov's rule. 3+4+3 =10

   b. What will be the major product if HBr is added to propene? What is anti-Markovnikov's rule? Explain.

   c. Complete the following reactions



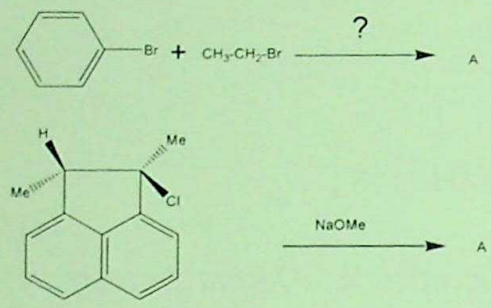


3. a. Define Saytzeff's rule. Mention the ways by which alkenes are synthesized. 3+2+3 +2=10

   b. What is Wurtz reaction? Give example

c. Write down the factors affecting the rate of E_2 elimination reaction. Draw the energy profile diagram of E_2 elimination reaction.

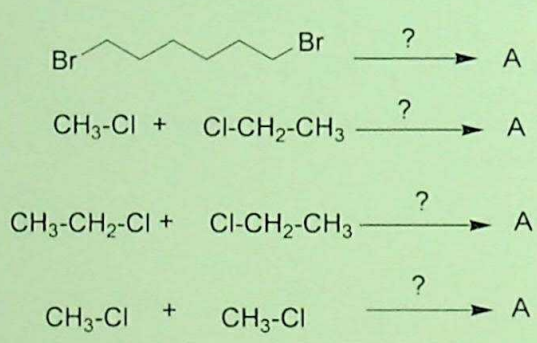
d. Complete the following reactions.



4. a. Define vicinal dihalides. Write the products formed by dehydrohalogenation of vicinal dihalides. **3+3+4 =10**

b. Write a note on free radical substitution reaction of methane.

c. Complete the following reactions



5. a. Write a short note on importance of electronic displacement. **3+3+4 =10**

b. What is mesomeric effect? Explain +M and -M effect

c. What is permanent electronic displacement? What are its types? Define electromeric displacement.

6. **a.** What is Annulene? Write the structure of 6-annulene and 8-annulene and comment whether it is aromatic, antiaromatic or nonaromatic. **4+3+3 =10**

   b. Write the synthetic route of Nitrobenzene and Give mechanism.

   c. Write the Huckel's rule of aromaticity and antiaromaticty.

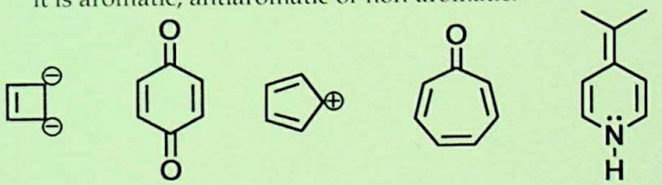
7. **a.** Define Enantiomers andDiastereomers? Give examples. **3+3+4 =10**

   b. What isMeso compound? Give examples.

   c. Write notes on Optical isomerism of Lactic acid.

8. **a.** Explain the following reactions with mechanism. **5+5=10**
   i) Friedel-Craft Alkylation of Benzene
   ii) Friedel-Craft Acylation of Benzene

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



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