

B.Sc. DEGREE EXAMINATION, APRIL 2023  
BRANCH IV - CHEMISTRY  
SECOND SEMESTER

COURSE : MAJOR – CORE  
PAPER : ORGANIC CHEMISTRY - I  
TIME : 3 HOURS

MAX. MARKS : 100

SECTION – A

ANSWER ALL THE QUESTIONS.

(30x1=30)

I Choose the correct answer.

- How many chiral carbon atoms are present in 2,3,4-trichloropentane?  
(a) three (b) two (c) one (d) four
- n-butane have several conformations given below. Which one out of these is more stable-  
(a) Eclipsed (b) Gauche (c) fully eclipsed (d) Anti form
- Polar solvent favors \_\_\_\_\_ mechanism  
(a) both  $S_N1$  and  $S_N2$  (b)  $S_N1$  (c)  $S_N2$  (d) neither  $S_N1$  nor  $S_N2$
- In  $S_N2$  reactions, the order of reactivity of the halides is in the order  
(a) Methyl>primary>secondary>tertiary (b) primary>secondary>tertiary>methyl  
(c) tertiary> primary> methyl> secondary (d) tertiary> secondary > primary> methyl
- Carbanion intermediate is formed in which reaction  
(a) E1 (b) E2 (c) E1CB (d)  $S_N1$
- Hydroboration of alkene proceeds through \_\_\_\_\_ membered transition state.  
(a) Three (b) Four (c) Five (d) Six
- Reformatsky reaction is used to prepare  
(a)  $\alpha$ -hydroxy acids (b)  $\beta$ - hydroxy acids (c)  $\gamma$ - hydroxy acids (d) none of these.
- The compound that does not answer the iodoform test is  
(a)  $CH_3CH_2COCH_3$  (b)  $CH_3COCH_3$  (c)  $C_6H_5COCH_3$  (d)  $C_6H_5COC_6H_5$
- The reaction of peroxyacid in acidic medium results in the formation of an ester from ketone is known as  
(a) Clemmensen reaction (b) Oppenaur reaction  
(c) Baeyer-Villiger reaction (d) Wolff-Kishner reaction.
- Which one of the following is used in Meerwein-Pondrof-Verley reduction?  
(a)  $LiAlH_4$  (b) Aluminum isopropoxide (c)  $NaBH_4$  (d) Raney-N

II Fill in the blanks:

- A mixture of equal parts of enantiomers is called a \_\_\_\_\_.
- The Fischer projection of 2R,3R-Tartaric acid is \_\_\_\_\_.
- In aromatic sulphonation the electrophile is \_\_\_\_\_.
- $S_N1$  mechanism occurs with \_\_\_\_\_ of configuration at a chiral centre.
- The major product of dehydrohalogenations of 2-bromobutane is \_\_\_\_\_.

16.  $\beta$ -elimination of quaternary ammonium hydroxide which results in the formation of less substituted alkene as the major product is known as \_\_\_\_\_ rule.
17. \_\_\_\_\_ reaction involves the reaction of an aromatic aldehyde and an active methylene compound in the presence of an amine.
18. Benzoin condensation involves aromatic aldehydes undergo self-condensation of two molecules, in the presence of \_\_\_\_\_.
19. Benzophenone on Clemmensen reduction gives \_\_\_\_\_.
20. Base sensitive carbonyl compound cannot be reduced using \_\_\_\_\_ reduction method.

### III State whether true or false:

21. Isomers which are the non-superimposable mirror images of each other are enantiomers.
22.  $S_N1$  reaction results only retention of configuration.
23. Propene undergoes ozonolysis process produces formaldehyde and acetaldehyde.
24. The IUPAC name of acetophenone is phenylmethanone.
25. The reagent used in the Oppenauer process is aluminium isopropoxide.

### IV Answer in a line or two:

26. What is meant by D and L notations?
27. What are electrophiles? Give examples.
28. State Saytzeff rule.
29. Give an example for cross Cannizzaro reaction.
30. Predict the product of ethyl acetate reduction with  $LiAlH_4$ .

### Section – B

Answer any five questions.

(5 x 6 = 30)

31. Discuss the erythro and threo representations with suitable example.
32. What are the relative advantages of Friedel-Crafts acylation over alkylation?
33. Summarize the electrophilic addition to conjugated dienes.
34. Write the preparation and reactions of cinnamaldehyde.
35. Discuss the mechanism of Oppenauer oxidation of cyclohexanol.
36. Discuss the orientation in di-substituted aromatic compounds.
37. What are stereoselective reactions? Explain.

### Section – C

Answer any two questions.

(2 x 20 = 40)

38. a. Discuss the conformational analysis of n-butane. (6)  
 b. Explain Cahn-Ingold-Prelog rules. (6)  
 c. Illustrate  $S_NAr$  and benzyne mechanisms with suitable examples. (8)
39. a. Explain  $S_N1$  and  $S_N2$  reaction with mechanism and write the role of substrate in the above reactions. (8)  
 b. Discuss the mechanism of peroxide initiated addition of HBr on propene. (6)  
 c. Describe the competition between elimination Vs substitution reactions. (6)
40. a. Write Perkin and Houben-Hoesch reactions with suitable mechanisms. (8)  
 b. Describe keto-enol tautomerism with evidence for two forms. (6)  
 c.  $LiAlH_4$  and  $NaBH_4$  are more selective to certain reduction reactions. Explain. (6)





