

**STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 86**  
**(For candidates admitted from the academic year 2023 – 2024)**

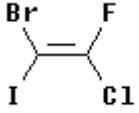
**B. Sc DEGREE EXAMINATION, APRIL 2024**  
**BRANCH - CHEMISTRY**  
**SECOND SEMESTER**

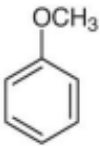
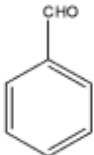
**COURSE: MAJOR CORE**  
**PAPER: ORGANIC CHEMISTRY-I**  
**SUBJECT CODE: 23CH /MC/OC24**  
**TIME: 3 HOURS**

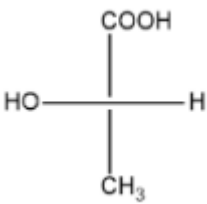
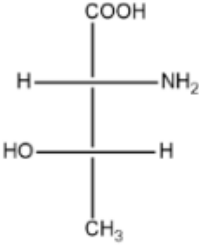
**MAX. MARKS: 100**

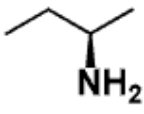
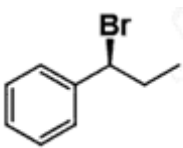
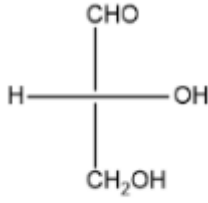
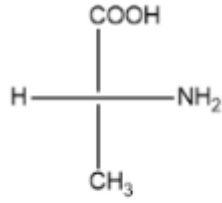
Q. No.	SECTION A (15 x 1 =15marks)	CO	KL
1	In S <sub>N</sub> 2 reactions, the order of reactivity of the halides is in the order a) methyl>primary>secondary>tertiary b) primary>secondary>tertiary>methyl c) tertiary> primary> methyl> secondary d) tertiary> secondary > primary> methyl	1	K1
2	Hydroboration of alkene proceeds through _____ membered transition state. a) Three                      b) Four                      c) Five                      d) Six	1	K1
3	Intermediate formed in E1cb reaction is a) carbocation              b) six membered cyclic transition state c) carbanion                  d) benzyne	1	K1
4	An activating group among the following is _____ a) -CHO                      b) -CN                      c) -COOH                  d) -NH <sub>2</sub>	1	K1
5	An example of a polar protic solvent is _____ a) DMF                      b) ethanol                  c) chloroform              d) benzene	1	K1
6	In aromatic nucleophilic substitution reaction _____ intermediate is formed a) cyclohexadienyl cation    b) benzoyl c) benzyne                      d) phenyl cation	1	K1
7	β -hydroxy esters are prepared using _____ reaction a) Claisen condensation                      b) Reformatsky c) Perkin    d) Knoevenegal	1	K1
8	Polar solvent favors _____ mechanism a) both S <sub>N</sub> 1 and S <sub>N</sub> 2                      b) S <sub>N</sub> 1 c) S <sub>N</sub> 2    d) neither S <sub>N</sub> 1 nor S <sub>N</sub> 2	1	K1
9	Cyclohexane exhibit several conformations. Which one of these is the most stable a) Eclipsed                  b) Gauche                  c) fully eclipsed              d) anti form	1	K1
10	Which one of the following is used in Meerwein-Pondrof-Verley reduction? a) LiAlH <sub>4</sub> b) Aluminum isopropoxide c) NaBH <sub>4</sub> d) Raney-Ni	1	K1
11	Which of the following shows geometrical isomerism? a) ethylene    b)1-choro propene    c) 2-butene                  d) 1-butene	1	K1

12	The group that has the highest priority according to the Cahn-Ingold-Prelog sequence rules is _____ a) $C\equiv CH$ b) $CH=CH_2$ c) $CH(OH)CH_3$ d) $CH_2CH_2OH$	1	K1
13	Which of the following is the most stable carbonium ion a) $CH_3^+$ b) $RCH_2^+$ c) $R_2CH^+$ d) $R_3C^+$	1	K1
14	Which product will be formed on addition of HBr to 2 methyl propene in the presence of peroxide. a) Markovnikov's product    b) anti-markovnikov's product c) Saytsef product    d) none	1	K1
15	The reagent used in benzoin condensation is a) KOH    b) NaOH    c) KCN    d) NaCl	1	K1

Q. No.	SECTION B (15 x 1=15marks)	CO	KL
16	The intermediate in $S_N1$ reaction is _____	2	K2
17	Acetophenone on Clemmensen reduction gives _____.	2	K2
18	State Saytzeff rule.	2	K2
19	What are electrophiles? Give examples	2	K2
20	Propene undergoes ozonolysis to produce _____	2	K2
21	The Fischer projection of 2R,3R-Tartaric acid is _____.	2	K2
22	Give any one method of preparation of acrolein	2	K2
23	The _____ is an organic reaction used to convert an $\alpha$ -haloester and an aldehyde or ketone to a $\beta$ -hydroxyester using zinc metal followed by an acid work-up.	2	K2
24	The electrophile for sulphonation reaction is _____	2	K2
25	Fischer projection of $CHOCHOHCH_2OH$ is _____	2	K2
26	$-NH_2$ group is _____ directing	2	K2
27	Apply E and Z configuration 	2	K2
28	Why is the alpha hydrogen attached to carbonyl group acidic in nature?	2	K2
29	Iodoform reaction is useful in identification of _____	2	K2
30	Define enantiomers	2	K2

Q. No.	<b>SECTION C (6 x 5 = 30 marks)</b> <b>Answer any six questions</b>	CO	KL
31	Distinguish Hofmann's and Saytzeff's elimination with an example	3	K3
32	Identify whether the groups attached to the benzene ring are activating or deactivating and justify the answers  <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  i.         </div> <div style="text-align: center;">  ii.         </div> </div>	3	K3
33	Summarize the electrophilic addition to conjugated dienes	3	K3
34	Outline the mechanism for Perkins and Claisen reaction	3	K3
35	Methyl group in toluene is o,p directing whereas the Nitro group in nitro benzene is meta directing. Explain.	3	K3
36	Apply the S <sub>N</sub> 2 reaction mechanism for the hydrolysis of ethyl chloride.	3	K3
37	Compare between elimination and substitution reactions	3	K3

Q. No.	<b>SECTION D (4 x 5=20marks)</b> <b>Answer any four questions)</b>	CO	KL
38	Deduce Friedel crafts alkylation and acylation of benzene with a suitable mechanism	4	K4
39	LiAlH <sub>4</sub> and NaBH <sub>4</sub> are more selective to certain reduction reactions. Explain	4	K4
40	Discuss the mechanism of peroxide initiated addition of HBr on propene	4	K4
41	Discuss with evidences the aromatic nucleophilic substitution reaction with benzyne intermediate formation	4	K4
42	Convert the following to Newman Projection formula  <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  i.         </div> <div style="text-align: center;">  ii.         </div> </div> <p style="text-align: right;">(2x 2.5)</p>	4	K4

Q. No.	SECTION E (2 x 10=20 marks) Answer any two questions	CO	KL
43	a) Using a suitable potential energy diagram evaluate the conformational analysis of cyclohexane conformers. b) Explain stereoselective and stereospecific reactions with one example each (6+4)	5	K5
44	Explain S <sub>N</sub> 1 and S <sub>N</sub> 2 reaction with mechanism and discuss the nature of substrate, leaving group and solvent affecting the reaction (5+5)	5	K5
45	Identify the chiral centers in each molecule and determine the absolute configuration as R or S <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>a)</p> </div> <div style="text-align: center;">  <p>b)</p> </div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 20px;"> <div style="text-align: center;">  <p>c)</p> </div> <div style="text-align: center;">  <p>d)</p> </div> </div> <p style="text-align: right; margin-right: 50px;">(4x2.5)</p>	5	K5
46	Discuss the mechanism for the following reactions a) Aldol condensation b) Knoevenagel c) Houben- Hoesch (3+3+4)	5	K5

\*\*\*\*\*