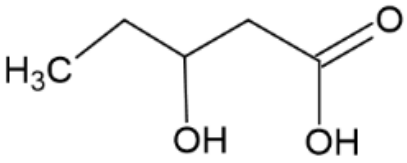
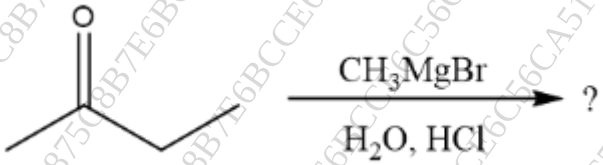
SET I

Subject: Pharmaceutical Organic Chemistry I **Year and Sem: First Year SEM-II**
Duration: 3 Hours **Total marks: 80**
Syllabus: CBCS R-2019

N.B. : 1. All questions are compulsory
2. Figures to right indicate full marks

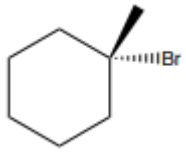
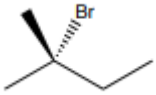
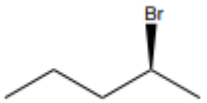
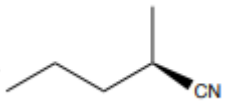
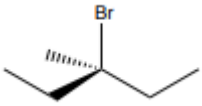
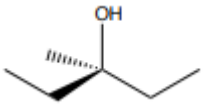
Q. 1	**Choose appropriate option for following multiple choice-based questions.**	**20**
1	Which of the following is not a type of structural isomerism?	
a	Functional Group	
b	Chain	
C	Position	
d	Geometric	
2	What is the IUPAC Name for the following compound? 	
a	4-Hydroxypentanoic acid	
b	3-Hydroxypentanoic acid	
C	2-Hydroxypentanoic acid	
d	3-Hydroxybutanoic acid	
3	Propan-1-ol and Propan-2-ol are an example of	
a	Position Isomerism	
b	Geometric Isomerism	
C	Functional Group Isomerism	
d	Chain Isomerism	
4	Which of the following statements regarding the SN2 mechanisms is wrong?	
a	SN2 reactions are bimolecular	
b	SN2 reactions are usually second order	
C	SN2 mechanism occurs in one step	
d	SN2 reactions usually occur in two steps	
5	Low concentration of nucleophile favours	
a	SN2 reaction	
b	SN1 reaction	
C	Both SN1 and SN2 reaction	
d	SNE reactions	
6	Which of the following undergoes nucleophilic substitution by SN1 mechanism?	

a	Ethyl chloride	
b	Isopropyl chloride	
C	Chlorobenzene	
d	Benzyl chloride	
7	SN2 mechanism proceeds through the intervention of	
a	Free radicals	
b	Carbonium ion	
C	Transition state	
d	Carbanion	
8	An ideal solvent for SN1 reaction -	
a	Polar protic solvent	
b	Polar aprotic solvent	
C	Non polar solvent	
d	Levelling solvent	
9	Why is the halogenation of alkanes considered a chain reaction	
a	It occurs quickly	
b	It occurs with generation of intermediates	
C	Each step generates reactive intermediates that causes next step to occur	
d	Reaction allows long chain of halogenated alkanes to be formed	
10	Chlorine free radicals react with methane by	
a	donating free radical electron to methane to form chloromethane	
b	abstracting a hydrogen atom from methane and producing hcl and methyl radical	
C	forming a carbanion intermediate that rapidly dissociates to produce chloromethanes	
d	forming a carbonium intermediate that rapidly dissociates to form chloromethane	
11	Why isotope effect is observed in E2 reaction?	
a	because it is bi molecular reaction	
b	because it is second order reaction	
C	because breaking of B carbon-hydrogen occur in rate determining step	
d	none of these	
12	2-methyl propene reacts with HBr to give	
a	tert butyl bromide	
b	isobutane	
C	n butyl bromide	
d	no reaction	
13	Why tertiary carbonium ion is more stable than primary and secondary carbonium ion	
a	due to presence of +I effect	
b	due to presence of-I effect	
C	due to steric hindrance	
d	Both a) and c)	

14	Which of the following alkenes will give a mixture of acetone and formaldehyde on ozonolysis?	
a	2 butene	
b	2-methyl 2-butene	
C	1 butene	
d	2 methyl propene	
15	If the double bonds are separated by one single bond the diene is called	
a	isolated diene	
b	conjugated diene	
C	cumulated diene	
d	none of these	
16	1,3 butadiene reacts with bromine to mainly give	
a	3,4 dibromo 1 butene	
b	4 bromo 1 butene	
C	1,4 dibromo 2 butene	
d	1 bromo 2 butene	
17	Which of the following statements is in accordance with Saytzeff's rule?	
a	2-Butene is less stable than 1-Butene	
b	2,3-Dimethyl-2-butene is more stable than 1-Butene	
C	2-Butene is more stable than 2,3-Dimethyl-2-butene	
d	2-Methyl-1-butene is more stable than 2,3-Dimethyl-2-butene	
18	Select the appropriate product for the following reaction. 	
a	Propionic acid	
b	3-methylbutan-2-ol	
C	2-methylbutan-2-ol	
d	butan-2-one	
19	Which of the following reagents is not an example of addition-elimination reaction with aldehyde and ketones?	
a	NH2OH	
b	KCN	
C	NH2NH2	
d	NH2NHC6H5	
20	What is the name of final addition product when alcohols are added to ketones?	
a	Hemiacetal	
b	Acetal	
C	Hemiketals	
d	Ketals	

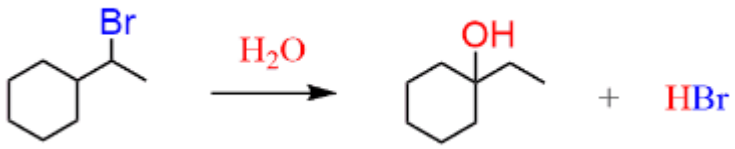
Q. 2 A **Answer any one question.** **12**

a Complete the given table: 12

SUBSTRATE	REAGENT	MAJOR PRODUCT	$S_N1/S_N2/E1/E2$
	$\xrightarrow[H_2O,\ heat]{NaOH}$		
	$\xrightarrow{H_2O}$		
	$\xrightarrow{CH_3OH\ /\ H_2O}$		
	$\xrightarrow[25^oC]{CH_3CH_2OH}$		
			
			

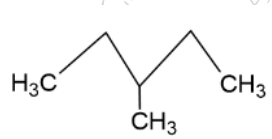
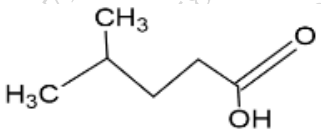
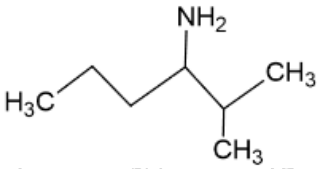
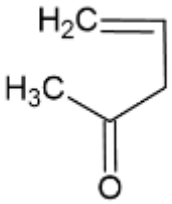
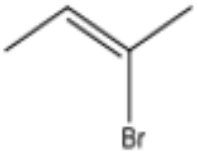
b I) Arrange the following in increasing order of reactivity towards SN1 reaction: CH3CH2CH2Cl, CH3Cl, CH3CH2C(CH3)2Cl and (CH3)3CCH2Cl. Justify the order. Predict the product of the reaction between the most reactive compound and ethanol and propose a mechanism for the formation of the same. 6

II) Explain in detail the given reaction with mechanism. 6



Q. 2 B **Answer any four questions** **48**

a I) Write the IUPAC names for the following 6

	 1  2  3  4  5  6	
	II) Give structures from the following IUPAC names 1) 2-Methylpentanal 2) Ethyl-2-methyl-butenoate 3) 2,3-Dichloro-1,5-dipentanamide 4) 3-Bromo-1-propene	4
	III) Draw the tautomeric forms of cyclohexanone and identify the tautomeric system.	2
b	I) Compound (A) C3H8O reacts with potassium dichromate in dilute sulphuric acid gives compound (B) which on reaction with 2,4-dinitrophenylhydrazine produce orange colour precipitate and also gives positive iodoform test but does not react with Tollen's reagent. The compound B forms a precipitate with phenylhydrazine and undergo self-condensation when heated with dil NaOH. Identify the compound A and B and justify the presence of compound A and B by writing reactions.	6
	II) Depict the detailed mechanism for any two: 1) Aldol condensation 2) Crossed Cannizzaro reaction 3) Perkin Condensation	6
c	I) Discuss any two methods of synthesis of carboxylic acids. Arrange the following in increasing order of acidity and justify: CH3CH2CH(Cl)COOH, ClCH2CH2CH2COOH, CH3CH2CH2COOH, CH3CHClCH2COOH	6
	II) Describe the factors affecting basicity with example. Give structure and uses of Ethanolamine, Amphetamine	6
d	I) How will you distinguish primary, secondary and tertiary alcohols by Lucas test? State chemical reactions. Write the mechanism of acidic dehydration of alcohols.	6

	II) Explain SP2 hybridization in Ethene. Give shape and geometry.	6
e	I) Discuss in detail the general reaction mechanism of nucleophilic addition reaction of aldehydes. Depict the mechanism of reaction of acetaldehyde with KCN. Write the reaction of the test used for differentiating aldehyde and ketone	6
	I) Elaborate on structural Isomerism in organic compounds with examples each	3
	II) Write the mechanism for the following reactions (Any one) 1) Hoffmann's degradation of amides 2) Fischer esterification	3