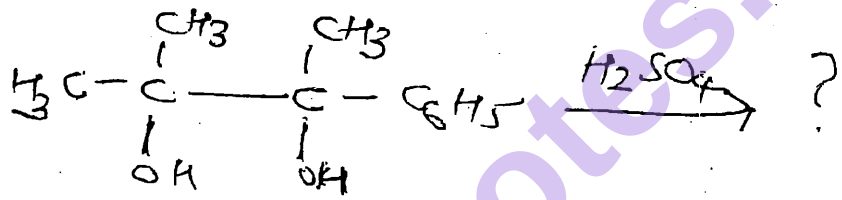
QP Code : 78931

(2 ½ Hours) **[Total Marks : 75**

N.B. : (1) **All** questions are **compulsory**
(2) **Figures** to the **right** indicate **full** marks.
(3) Use of log tables / Non Programmable calculator is allowed.

1. Answer **any three** of the following :

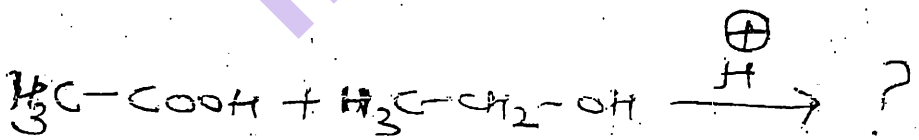
(A) Complete the following reaction, name the reaction and suggest a suitable mechanism. 5



(B) Distinguish between kinetically and thermodynamically controlled reactions with relevant examples. 5

(C) What is Hofmann rearrangement? Give an example and suggest its mechanism. 5

(D) (a) Give the mechanism involved in the following reaction. 3

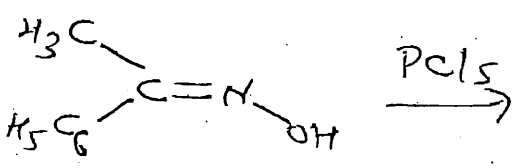


(b) Give one synthetic application of Michael addition reaction. 2

(E) (a) Discuss the mechanism involved in the base catalysed dehydrohalogenation of tertiary butylbromide. 3

(b) Write the products formed in the following reactions. 2

i)



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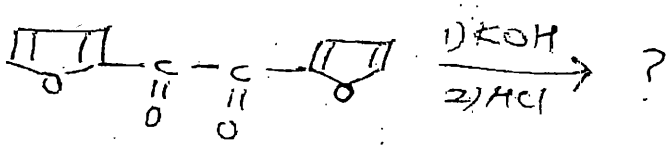

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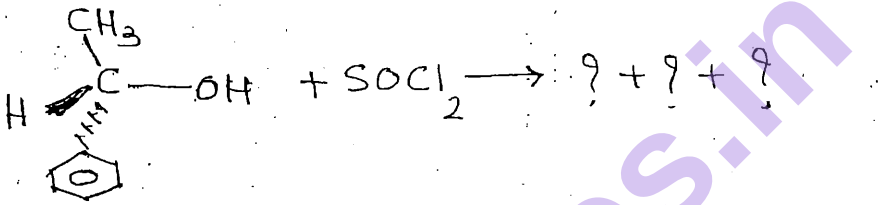
(F) (a) Give the mechanism involved in the formation of acetal. 3
(b) Explain the term basicity with a suitable example. 2

2. Answer **any three** of the following :-

(A) Complete the following reaction Explain its S_Ni mechanism and stereochemistry. 5



(B) Explain ' angle strain' in cycloalkanes. Calculate angle strain in cyclopropane, cyclobutane, cyclopentane, considering their planar structures. 5

(C) Explain the mechanism and stereochemistry of bromination of trans-2-butene. 5

(D) Draw two chair conformations each of cis and trans isomers of 1, 3-dimethylcyclohexane. Which of the four conformers is more stable? Why? 5

(E) Explain the chirality of unsymmetrically substituted spirans with suitable examples. 5

(F) Explain the mechanism and stereochemistry of base induced dehydrohalogenation of 1-bromo-1,2-diphenylpropane. 5

3. Answer **any three** of the following :-

(A) (a) What is anomeric carbon? What are anomers? Draw the chair conformation of α-D-fructopyranose and β -D-Glucopyranose. 3
(b) What are α-anomers? Give examples. 2

(B) Explain the following
(a) mutarotation
(b) oligosaccharides 5

(C) (a) Give the following reactions of D-glucose
(i) acetylation
(ii) reduction with $NaBH_4$ 3

(b) How will you convert D (-) Arabinose to D (+) Glucose? 3

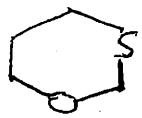
(D) (a) Give the complete methylation reaction of α and β–D -glucopyranose. 3

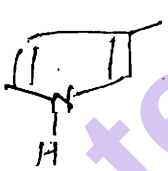
(b) What is the action of phenyl hydrazine on D (+) glucose and D (-) fructose? 2

(E) (a) Write an account of commercial importance of carbohydrates. 3

(b) What is the action of HIO_4 on D-Glucose and D-fructose? 2

(F) (a) Give the I.U.P.A.C names of the following :- 3

i) 

ii) 

iii) 

(b) Give the structures of the following : 2

(i) 1, 2- oxazole

(ii) perhydroazine

4. Answer **any three** of the following :-

(A) (a) What is the action of following reagents on pyrrole. 3

(i) Acetyl nitrate

(ii) pyridine and SO_3

(iii) Acetic anhydride

(b) Draw the resonating structures of thiophene. 2

(B) (a) Discuss ring opening reaction of furan 3

(b) Write the Paal-Knorr Synthesis for preparation of Furan. 2

(C) (a) Explain Hoffmann's exhaustive methylation and elimination reaction with pyrrolidine. 3

(b) What is quaternisation of amines? Give an example. 2

(D) Explain the following :- 5

(a) Hantzsch synthesis of pyridine derivatives.

(b) Mannich reaction, with a suitable example

Why are the above two called multicomponent syntheses?

(E) Explain the use of phase transfer catalysts and crown ethers in organic synthesis with suitable examples. 5

(F) Write synthesis and uses of the following. 5
(a) Ibuprofen (Chiral synthesis)
(b) Bifenox-I

5. (A) Complete the following statements by choosing the right alternative. 4
(a) NH_3 is _____than H_2O
(more acidic, more nucleophilic, less basic)
(b) E_2 reaction takes place in the _____conformation
(Syn-periplanar, anti-periplanar, gauche)
(c) Base catelysed hydrolysis of ester involves_____fission.
(alkyl-oxygen, aryl-oxygen, acyl-oxygen)
(d) An aliphatic primaryamine reacts with an aldehyde to give an___
(amidine, imine, iminol)

OR

5. (A) State whether the following are **true** or **false**. 4
(p) Nucleophilicity is a kinetic property.
(q) Dehydrohalogenation of 2-iodoethane takes place through E_2 mechanism.
(r) All Lewis acids are electrophilic
(s) Claisen condensation involves a nucleophilic substitution.

5. (B) State whether the following are **true** or **false**.
(a) In base induced dehydrohalogenation of 1-bromo-1,2-diphenylpropane, the erythro substrate gives a cis-olefin product.
(b) In bromination of 2-butene, the trans-substrate gives a racemate product.
(c) In catalytic hydrogenation of 2, 3-diphenyl 2-butene, the cis-substrate gives a racemate product.
(d) In syn-hydroxylation of alkenes using osmium tetroxide, a cis-substrate gives a meso vicinal diol.

OR

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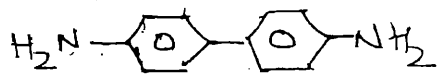
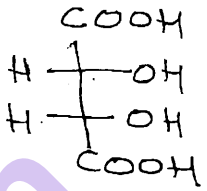
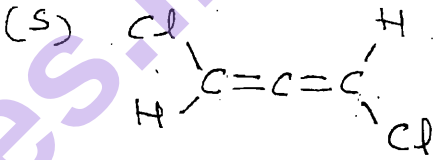
5. (B) State whether the following molecules are chiral or achiral. 4

p) 

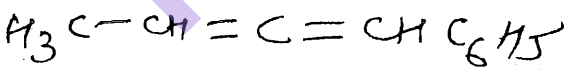
q) 

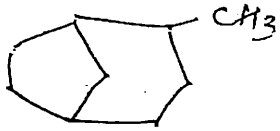
r) 

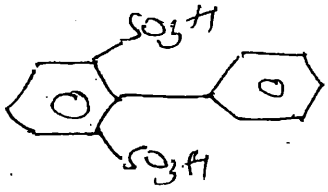
(s) 

(C) Give IUP AC name for the following :- 4

a) 

b) 

c) 

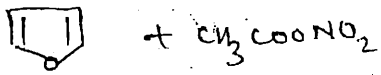
d) 

OR

(C) Give the structure of the following : 3

(p) 1-Bromo-1,2- hexadiene
(q) Bicyclo[4.2.0] octane
(r) Spiro [3.4] oct-2-ene
(s) 2, 4' - diaminodiphenyl

(D) Complete the following reactions .

a)  $\xrightarrow{-5^{\circ}C}$?

b)  $+ CH_3COCl \xrightarrow[50^{\circ}C]{SnCl_4}$?

c)  $\xrightarrow{LiAlH_4}$? 3

OR

(D) Match the columns appropriately.

'A'	'B'
(p) Ibuprofen	antibiotic
(q) Paracetamol	vitamin
(r) L-ascorbic acid	hormone
	analgesic- antipyretic
	anti-inflammatory

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