[Time: 2 hours] **[Total Marks: 50]**

Please check whether you have the right question paper.

NB: 1. All the questions are compulsory.

2. Figures to the right indicate full marks.

Q.1) **Answer any two of the following:**

a How do the following techniques help in determining the mechanism of the reaction? 5

i)Product analysis

ii) Trapping of intermediates

b What is general and specific catalysis? Explain its mechanism with suitable examples. 5

c Compare the basicity of pyridine, pyrrole, and piperidine. 5

d Give examples and explain the following: 5

i) Primary kinetic isotopic effect

ii) Secondary kinetic isotopic effect

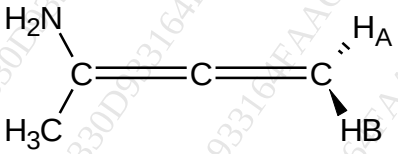
Q.2) **Answer any two of the following:**

a Draw four stereoisomers of 2,3,4-trihydroxy glutaric acid. Label pseudoasymmetric centre present in the stereoisomers and assign configurational descriptors to the pseudoasymmetric centre. 5

b Explain the stereochemistry of tri coordinated 'C' species namely carbocation, carbanion, carbon free radical 5

c i)State and explain prochiral center with suitable example. 2

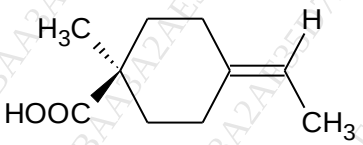
ii)Write stereochemical descriptor to H_A and H_B. 3



d i)Write the structure of pair of enantiomeric biphenyl with their configurational descriptors. 2

ii)Write the configurational descriptor to the following molecules 3

1)



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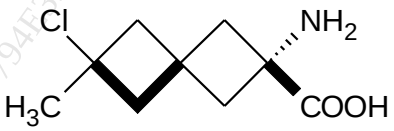

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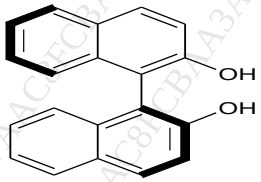

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Q.3) Answer any two of the following:

a Why inversion of configuration is much more during solvolysis of (I) than (II)? Explain with mechanism. 5

$C_6H_{13}CH(CH_3)Cl$ **(I)** $C_6H_5CH(CH_3)Cl$ **(II)**

b Explain aromatic nucleophilic substitution reaction in pyridine with suitable mechanism. 5

c Explain acid catalyzed hydrolysis of ester using A_{AC}^2 mechanism. 5

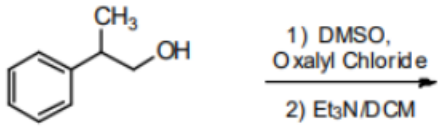
d Explain aromaticity of the following: 5
i) Thiophene (ii) Pyridine

Q.4) Answer any two of the following:

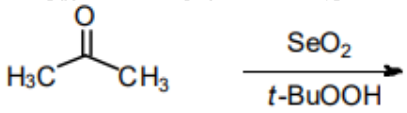
a What is Corey-Kim oxidation? Give example with mechanism 5

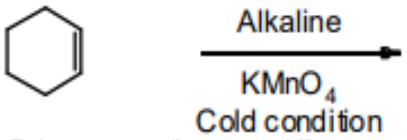
b Write note on Wolf Kishner Reduction. 5

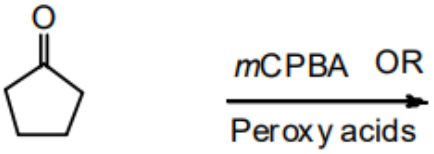
c Predict the product in the following reactions: 5

i) 

ii) 

iii) 

iv) 

v) 

d Illustrate use of the DIBAL-H and K-selectrids in organic synthesis, with two example each. 5

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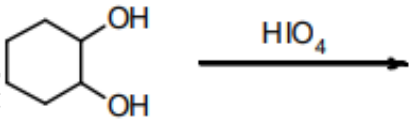
Q.5) Answer **any FIVE** of the following:

a	State the principle of microscopic reversibility	2
b	Compare acidity of Trifluoroacetic acid and acetic acid	2
c	Explain with suitable example improper axis of symmetry	2
d	Explain *erythro-threo* system of nomenclature with suitable examples.	2
e	What is an antiaromatic compound? Give one example.	2
f	Why cyclopropenyl cation is called smallest aromatic system?	2
g	Complete the following reactions.	2

1)

2)



h	Illustrate the use of Red Al in organic synthesis, with two examples.	2

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