[Time: 2 and ½ Hours] **[Total Marks: 60]**

Please check whether you have got the right question paper.

NB: 1. All the questions are compulsory.
2. Figures to the right indicate full marks.

Q.1) (A) Answer any two of the following:

a Explain primary and secondary kinetic isotope effect, using suitable examples. **4**

b Explain the use of the following techniques as mechanistic evidence: **4**
i) Trapping of intermediates
ii) Cross – Over experiments

c Write note on Hammonds postulate **4**

d With the help of a potential energy diagram, explain kinetic vs. thermodynamically controlled products using sulphonation of naphthalene as an example. **4**

(B) Answer **any one** of the following;

a Arrange the following in increasing order of basicity and justify your answer: **4**
Aniline, Ethyl amine, Diphenyl amine ,Diethyl amine

b Explain; - **4**
i) Dichloroacetic acid is stronger acid than acetic acid
ii) General acid - base catalysis.

Q.2) (A) Answer any two of the following:

a i) What is the **BAC^2** mechanism of ester hydrolysis? Give its example. **4**
ii) Discuss the **SN^2** mechanism with a suitable example.

b Draw Frost - Musulin diagram for the cyclopentadienyl cation and cyclopropenyl cation. Show the distribution of electron in their MOs. **4**

c Discuss the mechanism of SN reaction involving neighbouring group participation by Aryl ring. **4**

d Explain the factors affecting SN^I and SN^2 reactions.

(B) Answer **any one** of the following;

a Write a short notes on **4**
i) Hard and soft nucleophiles.
ii) Aromaticity of Furan

b Explain SNAr mechanism with a suitable example. **4**

Q.3) (A) Answer any two of the following:

a Explain the chirality of allenes. Write the structure of pair of enantiomeric allenes with their configurational descriptors. **4**

b Explain the stereochemistry of tri and tetra coordinated sulphur compounds. **4**

c 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. **4**

d Explain the following terms with one example each **4**
1) Homotopic ligand and faces
2) Enantiotopic ligand and faces

(B) Answer **any one** of the following;

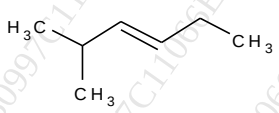
a 1) Explain the term principal axis with example **2**
2) Explain *syn-anti* system with suitable example. **2**

b Draw the structure of following. **4**
1) S- BINOL
2) S- 2,2'- dinitro biphenyl 6,6'- dicarboxylic acid

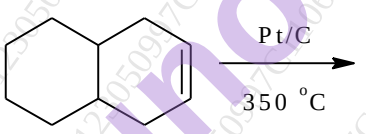
Q.4) (A) Answer any two of the following:

a Predict the product in the following reactions **4**

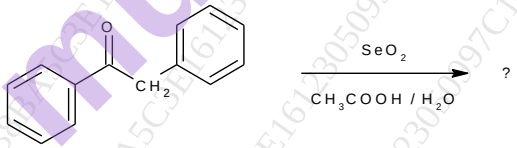
1)



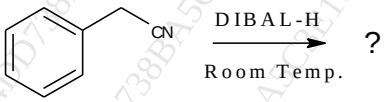
2)



3)

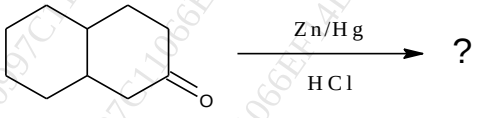


4)



b What is Oppenaur oxidation? Give its mechanism. **4**

c Complete the following reaction, name it and give its mechanism **4**

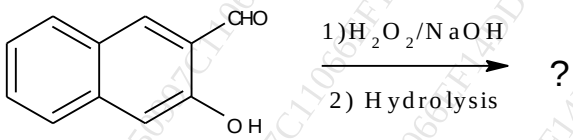


d What is Collin's reagent? Give two applications. **4**

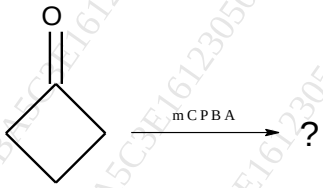
(B) Answer **any one** of the following;

a Complete the following reactions and name them. **4**

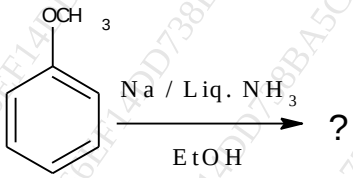
1)



2)



b Complete the following reaction, name it and give its mechanism **4**



Q.5) Answer **any four** of the following;

a What is specific catalysis? Explain its mechanism with a suitable example. **3**

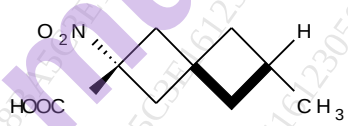
b Discuss use of trapping intermediates in determing the mechanism of reaction. **3**

c Explain the AAL^1 mechanism for ester hydrolysis. **3**

d What are homoaromatic compounds? Give two examples. **3**

e Write the configurational descriptor to the following molecules **3**

1)



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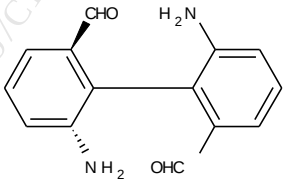
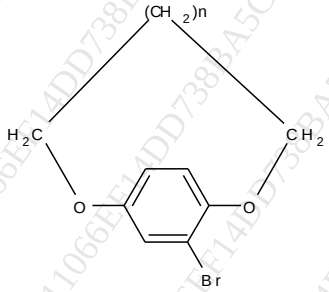


3)



f Explain the optical activity of cyclophanes. **3**

g What is Swern oxidation? Give two applications. **3**

h Write the mechanism of Wolf Kishner Reduction. **3**

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