[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 Why does Nitration of naphthalene give two different products at different temperature? Explain. **4**

b Explain the use of the following techniques as mechanistic evidence: **4**
i) Product analysis
ii) Kinetic studies

c Write a note on Curtin-Hammet Principle. **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: Phenol, o-nitrophenol, m-nitrophenol,p-nitrophenol. **4**

b Discuss the various factors that affects the acidity. **4**

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

a What is the $\mathbf{AAC^2}$ mechanism? Explain $\mathbf{AAC^2}$ mechanism for ester hydrolysis. **4**

b Explain
i) AAL^1 mechanism with a suitable example.
ii) Ipso and cine substitution.

c Draw Frost Musulin diagram for the cyclopentadienyl anion and show the distribution of electron in their MOs .Comments on its aromaticity. **4**

d Explain the mechanism of SN reaction involving neighbouring group participation by pi bond. **4**

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

a Write a short note on **4**
i) Antiaromatic compounds
ii) Aromaticity of Azulene

b What is SET? Explain SET mechanism with a suitable example. **4**

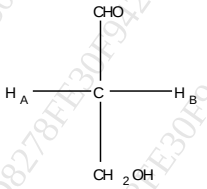
Q.3) (A) **Answer any two of the following:**

a Discuss the stereochemistry of biphenyls. Give one example with its configurational descriptor. **4**

b Explain the enantiomerism in the following with suitable examples. **4**
1) Quaternary phosphonium compounds
2) Silanes

c Define pseudoasymmetric centre. Draw structure of two isomeric structures containing pseudoasymmetric centre. Assign configurational descriptors to them. **4**

d Using substitution addition criterion, identify relationship between H_A and H_B. Write stereochemical descriptor to H_A and H_B. **4**



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

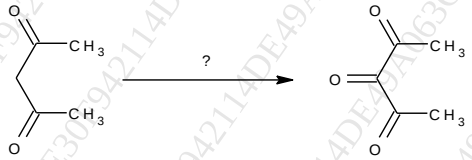
a Explain erythro-threo and *syn-anti* system of nomenclature with suitable examples. **2**

b Explain the following terms with one example each **2**
i) Enantiotopic ligand and faces
ii) Diastereotopic ligand and faces

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

a Write the reagent for the following reactions. **4**

1)



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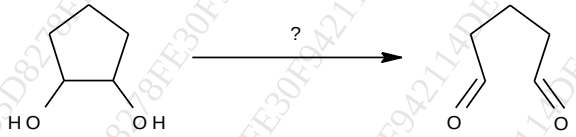

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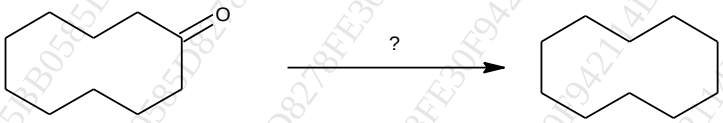
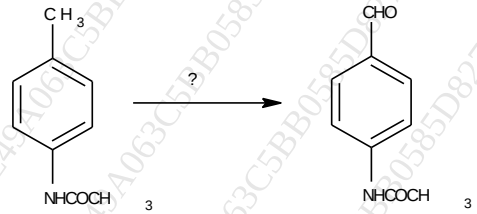
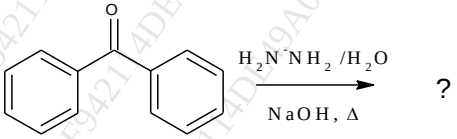


4)



b What is Baeyer Villiger oxidation? Give its mechanism. **4**

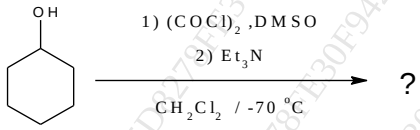
c Complete the following reaction, name it and give its mechanism. **4**



d What is Corey's reagent? Give two applications of it. **4**

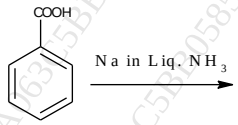
(B) Answer **any one** of the following;

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



b Complete the following reaction, and name them **4**

1)



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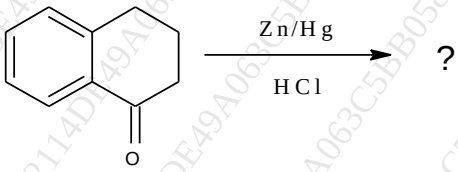


Q.5) Answer **any four** of the following;

a What is specific acid and base catalysis? Illustrate specific acid catalysis with a suitable example. **3**

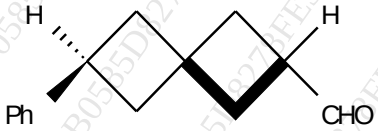
b Discuss use of trapping of intermediates in determine the mechanism of reaction. **3**

c Explain with example, SN^i mechanism. **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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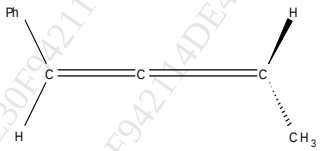

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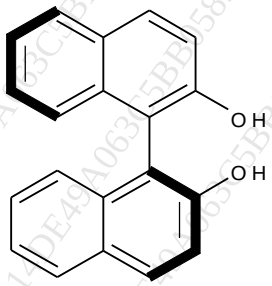

f Explain the optical activity of 'Ansa' compounds. **3**

g What is Oppenauer oxidation? Give its Mechanism. **3**

h Illustrate use of the following reagents in organic synthesis, with one example each. **3**

i) Red Al

ii) DIBAL-H

iii) L – Selectride

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