

[Time: 2 hours ]

[Total Marks: 50]

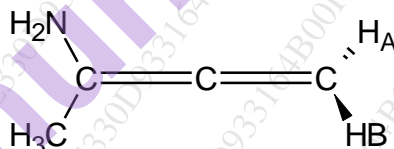
Please check whether you have the right question paper.

NB: 1. All the questions are compulsory.

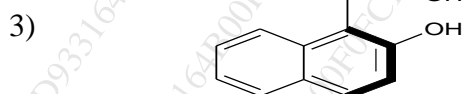
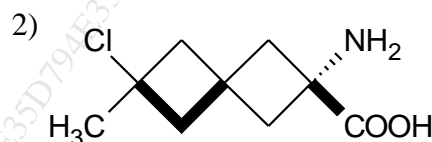
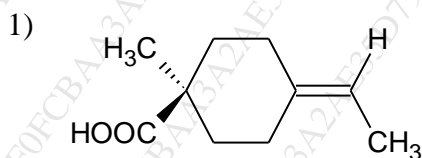
2. Figures to the right indicate full marks.

- 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<sub>A</sub> and H<sub>B</sub>. 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



**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



(I)

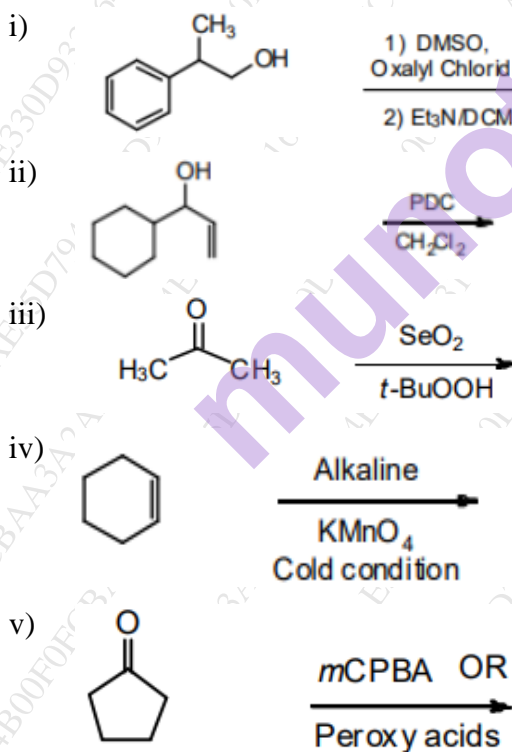


(II)

- b Explain aromatic nucleophilic substitution reaction in pyridine with suitable mechanism. 5
- c Explain acid catalyzed hydrolysis of ester using  $\text{A}_{\text{AC}}^2$  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



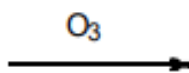
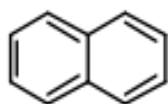
- d Illustrate use of the DIBAL-H and K-selectrids in organic synthesis, with two example each. 5

Q.5)

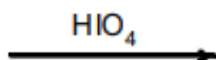
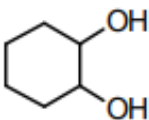
Answer **any FIVE** of the following:

- 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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