



# THE AMERICAN COLLEGE, MADURAI

(An Autonomous Institution Affiliated to Madurai Kamaraj University)  
Re-accredited (2<sup>nd</sup> Cycle) by NAAC with Grade "A", CGPA – 3.46 on a 4-point scale

## Backlog Arrear Examination, March 2021

CHE 2521/CHS 2511

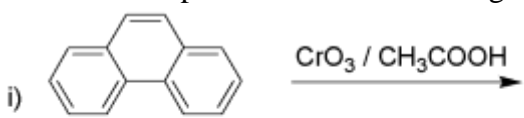
Organic Chemistry - II

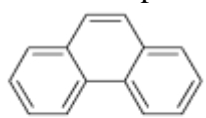
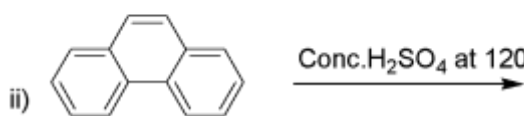
Duration: 3 Hrs

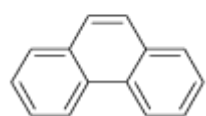
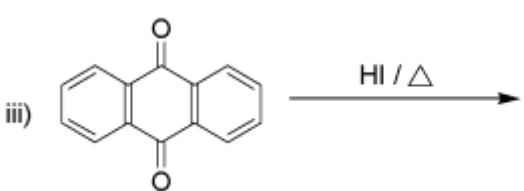
Marks: 75

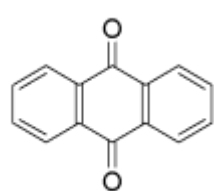
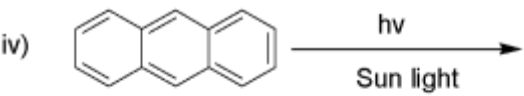
Answer any five questions

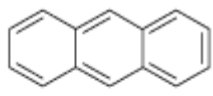
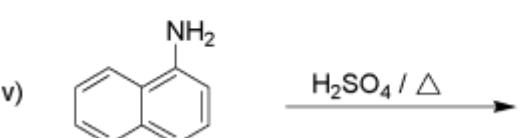
(5 x 15 = 75 marks)

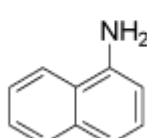
1. A. Substantiate the following (10)
- The aromatic electrophilic substitution reaction proceeds via two step mechanism.
  - The first step in aromatic electrophilic substitution reaction is relatively slower than the second step.
- B. Explain the resonance structure why nitro benzene is meta directing and aniline is o/p directing. Differentiate between the o/p directing and meta directing groups (5)
2. A. Give the mechanism for  $S_N^1$  and  $S_N^2$  reaction. Write the difference between  $S_N^1$  and  $S_N^2$  mechanism. (8)
- B. What do you mean by Benzyne mechanism? Discuss the steps involved in it with any three evidences in favour of this mechanism. (7)
3. A. Predict the products of the following reaction (10)
- 

i)   $\xrightarrow{\text{CrO}_3 / \text{CH}_3\text{COOH}}$
  - 

ii)   $\xrightarrow{\text{Conc. H}_2\text{SO}_4 \text{ at } 120^\circ\text{C}}$
  - 

iii)   $\xrightarrow{\text{HI} / \Delta}$
  - 

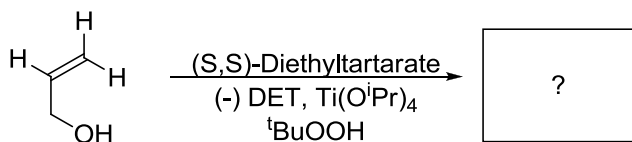
iv)   $\xrightarrow[\text{Sun light}]{h\nu}$
  - 

v)   $\xrightarrow{\text{H}_2\text{SO}_4 / \Delta}$
- B. Discuss the reduction reaction of  $\text{C}_{10}\text{H}_8$  under different conditions. (5)

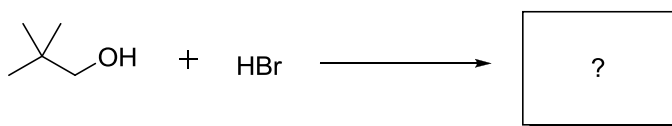
4. A. Explain the steps involved in synthesis of the following compounds in detail (10)
- Mercaptal
  - Mustard gas
  - Sulphone
  - Cyclohexane thiol
  - Thioethers

B. Using proper mechanism, identify the product and explain the steps involved in the conversion. (5)

(a)



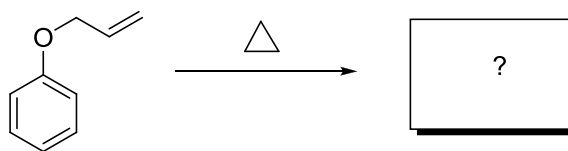
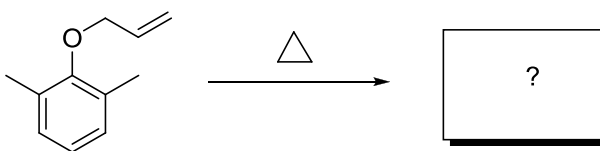
(b)



5. A. Explain the following reactions using proper mechanism. (7)
- Reimer Tiemann reaction
  - Gattermann synthesis

B. Discuss the effect of substituents on the acid strength of phenol. (8)

6. A. Identify the products and by suitable mechanism outline the rearrangement of the given reactions. (8)



B. Explain Hydroboration-oxidation with suitable example. (7)

7. A. Illustrate the Haworth synthesis of phenenathrene. (5)

B. Explain the relative acidity of  $1^\circ, 2^\circ, 3^\circ$  alcohols. (5)

C. Illustrate the Chloromethylation reaction of benzene. (5)