

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2018
(Second Semester)

Branch – CHEMISTRY

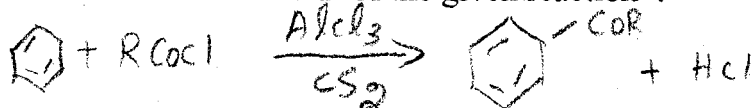
ORGANIC CHEMISTRY – II

Time : Three Hours

Maximum : 75 Marks

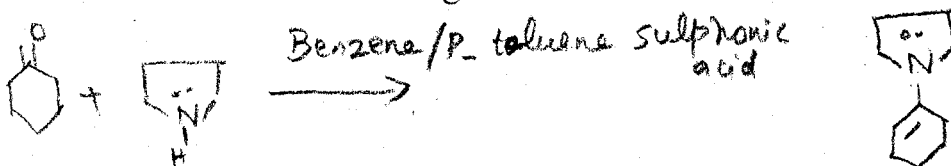
Answer ALL questions
ALL questions carry EQUAL marks (5 x 15 = 75)

- 1 a Discuss the mechanism of the given reaction :



- b Why is it necessary to use more than one mole of the catalyst ($AlCl_3$) per mole of the reagent? (3+2)

- c Predict the mechanism for the given reaction :



- d In the preparation of enamine why is it necessary to remove water from the reaction mixture?

- e Why is cyclic amine generally used as the secondary amine in the enamine synthesis?

- f How is water eliminated? (4+2+2+2)

OR

- g Halogens are ring deactivators but o, p directors. Explain. (3)

- h Why is nitration with acetyl nitrate accelerated by adding fluoroboric acid but retarded by adding hydrochloric acid? (3)

- i Benzenediazonium chloride does not couple with anisole whereas 2, 6-dinitro benzene diazonium chloride does? Give reason. (3)

- j Discuss the effect of solvent on SE^1 and SE^2 reactions. (4)

- k Distinguish between singlet and triplet carbenes. (2)

- 2 a Write $E1cB$ mechanism. Why is this mechanism designated as $E1cB$? Which substrates are very prone to react by this mechanism? Illustrate with suitable example. (6)

- b Neomenthyl chloride in the presence of base undergoes elimination faster than menthyl chloride by 200 times. Explain. (3)

- c 2-phenyl ethyl bromide undergoes $E2$ elimination about 10 times as fast as 1-phenyl ethyl bromide. Account for this difference. (3)

Cont...

- 2 Cont...
- d Illustrate Birch reduction with suitable mechanism. (3)
OR
- e Illustrate Hofmann and Saytzeff rules with suitable example. (6)
- f Discuss the synthetic utility of chromic acid and SeO_2 in organic synthesis. (6)
- g Illustrate any one pyrolytic elimination with suitable example. (3)
- 3 a Explain the difference in orientation in the addition of HBr to 1-butene with and without the presence of peroxide. (4)
- b Illustrate Michael addition reactions with suitable mechanism. (4)
- c What is hydroboration? Illustrate with suitable example. (3)
- d What is Wittig reaction? Illustrate with suitable mechanism. (4)
OR
- e Discuss the reactivity of double and triple bonds towards electrophilic substitution. (5)
- f Identify the product and predict the mechanism for the following reactions :
- (i) $2\text{C}_6\text{H}_5\text{CHO} \xrightarrow[\text{KCN}]{:\text{CN}} \text{product}$
- ii) $\text{CH}_3\text{CHO} + \text{H}_2\text{C} \begin{array}{l} \nearrow \text{COOC}_2\text{H}_5 \\ \searrow \text{COOC}_2\text{H}_5 \end{array} \xrightarrow{\text{Piperidine}} \text{product.}$ (8)
- g Claisen condensation is intra molecular rearrangement. Justify this statement with suitable example. (2)
- 4 a Discuss the uses of the following reagents in protein chemistry :
(i) carbobenzyloxy chloride (ii) p-nitrophenylester
(iii) ethylchloroformate (9)
- b Illustrate solid phase peptide synthesis with suitable example. (4)
- c What are nucleotides? (2)
OR
- d Distinguish between RNA and DNA. (3)
- e How are N-terminal and C-terminal amino acids protected? illustrate with suitable example. (6)
- f What are the factors influencing enzyme action? (3)
- g Distinguish between enzyme and coenzyme. (3)

- 5 a What are crown ethers? How is dibenzo – 18 – crown – 6 synthesised? Discuss the applications of crown ethers in oxidation, substitution and elimination reactions. (8)
- b What is Wilkinson's catalyst? How is it useful in oxidation decarboxylation and angular methylation reactions? (5)
- c Sodium borohydride is mild reducing agent than lithium aluminium hydride. Comment on it. (2)
- OR
- d Discuss the method of preparation and any two synthetic applications of the following reagents : (8)
- (i) 1, 3 - dithiane (ii) Gilman's reagent
- e Discuss the use of ozone in elucidating the structure of alkenes. (3)
- f Why does 1 – chlorooctane fail to undergo nucleophilic substitution by cyanide in the absence of PTC? What is the role of PTC in effecting the reaction? (4)

Z-Z-Z

END