

Roll No.

Total Pages : 5

337302

December, 2019

B.Sc. (H) Chemistry - III SEMESTER

Organic Chemistry-II (BCH-302)

Time : 3 Hours]

[Max. Marks : 75

Instructions :

- 1. It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
- 2. Answer any four questions from Part-B in detail.*
- 3. Different sub-parts of a question are to be attempted adjacent to each other.*

PART - A

1. (a) Why is it not possible to use conc. HCl or conc. HNO₃ in place of H₂SO₄ for carrying out dehydration of alcohols? (1.5)
- (b) Phenol does not give effervescence with sodium bicarbonate while trinitrophenol does so. Justify this observation. (1.5)

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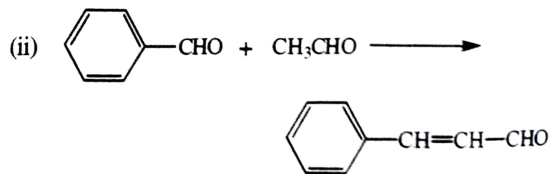
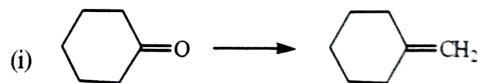
- (c) How will you prepare cinnamic acid from benzaldehyde? (1.5)
- (d) Arrange the following compounds in increasing order of their expected acidic strength and justify your answer : diethylmalonate, acetone, chloroacetone. (1.5)
- (e) Explain the structure of Carbonyl group. (1.5)
- (f) What happens when methyl magnesium bromide reacts with ethylene oxide. (1.5)
- (g) Why *o*-hydroxybenzoic acid is a stronger acid than *o*-methoxybenzoic acid? (1.5)
- (h) Why acetamide is amphoteric in nature? (1.5)
- (i) Predict the effect that increasing solvent polarity will have on the rate of an S_N2 reaction. (1.5)
- (j) Why are allyl halides more reactive than alkyl halides towards nucleophilic substitution reactions? (1.5)

PART - B

2. (a) Explain why does nucleophilic substitution reaction of chlorobenzene take place through benzyne mechanism and that of *p*-nitrochlorobenzene proceeds via addition-elimination mechanism? (5)

- (b) Discuss the mechanism of Pinacol-Pinacolone rearrangement. (5)
- (c) What happens when benzaldehyde react with KCN and also give the mechanism of this reaction. (5)

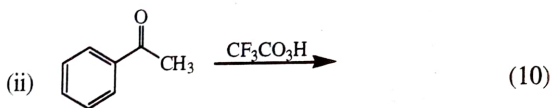
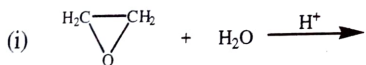
- 3 (a) Write the mechanism of :
 (i) Wolff-Kishner reduction.
 (ii) Reimer-Tiemann reaction. (10)
- (b) Discuss the mechanism of oxidative cleavage of 1,2-glycols with periodic acid. (5)
4. (a) Starting from Grignard reagent, how will you prepare
 (i) 2-Butanone.
 (ii) Ethanoic acid. (5)
- (b) Suggest the mechanism of following conversions and also give their names :



(10)

5. (a) Discuss the stereochemistry of S_N1 and S_N2 reactions. (4)
- (b) How will you prepare *n*-valeric acid using ethylacetoacetate. (4)
- (c) Write the mechanism of Hofmann-bromamide degradation. (5)

6. (a) Complete and give the mechanism of following reactions:



- (b) Write chemical equation for the reaction of chlorobenzene with ammonia in presence of sodamide at 190 K. (2)
- (c) Why do carboxylic acids behave as acids whereas alcohols don't although both have an -OH as a part of their structures? (3)

7. (a) Describe the acid catalysed and base catalysed aldol reaction and explain the difference in their mechanism. (7)
- (b) Discuss Sandmeyer reaction. (3)
- (c) Complete the following reaction and also give its mechanism :

