

**B.A. / B.Sc. SEMESTER 2 EXAMINATION, 2020**  
**FAKIR CHAND COLLEGE CENTRE (551)**

**INSTRUCTIONS FOR CANDIDATES**

**READ ALL THE INSTRUCTIONS CAREFULLY BEFORE WRITING ANSWERS**

1. Total **TIME OF EXAMINATION: 2 HOURS**
2. **Question Paper Comprises Of Three Separate Questions – Theoretical (25 Marks), Practical (15 Marks) And Internal Examination (10 Marks). Candidates Must Have To Answer All The Three Separately And Finally Have To Prepare A Single pdf File By Scanning All The Papers Clearly And Serially (According To Page Numbers).**
3. **ATTACH ANYONE PREVIOUS SEMESTER ADMIT CARD**As The Last Page Of Thepdf File
4. Use Only **WHITE PLAIN A4 PAPERS**For Writing Answers
5. Use **ONLY BLACK INK**For Writing Your Answers
6. Give **A TOP PAGE**With Clear Mention Of University **REGISTRATION NO. AND UNIVERSITY ROLL NO.**Of Anyone Previous Semester
7. **GIVE PAGE NO.** At The Top Right/Middle Of Each Page
8. Give **AT LEAST 1CM MARGINS** In All The Four Sides Of Each Page

**2020**  
**B.A. /B.Sc. Semester 2 Examination**  
**University of Calcutta**  
**CHEMISTRY – HONOURS**  
**THEORETICAL**  
**Paper : CC3**  
**F.M. 25**

**FAKIR CHAND COLLEGE CENTRE(551)**

**1. Answer ANY FOUR questions**

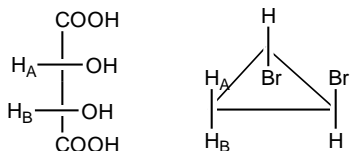
4x1= 4

- a) Give an example of axially chiral molecule indicating the chiral axis.
- b) What is atropisomerism?
- c) Which one is the better nucleophile of the following pair of oxyanions  $\text{OH}^-$  and  $\text{OOH}^-$ ?
- d) What do you mean by primary kinetic isotope effect?
- e) For phenol there is no evidence for the existence of keto form-Explain.
- f) Give one example of ambident nucleophile.
- g) Give one example of prostereogenic centre.

**Answer ANY THREE from Question Nos. 2 to 7.**

2(a) Identify  $\text{H}_\text{A}$  and  $\text{H}_\text{B}$  in each of the following structures as homotopic, enantiotopic or diastereotopic and explain.

4



(b) What will be the configuration of the product when  $\text{CH}_3\text{MgBr}$  attacks from the Re face of butan-2-one.

3

3(a) All the four ethyl halides,  $\text{C}_2\text{H}_5\text{X}$  ( $\text{X}=\text{F}, \text{Cl}, \text{Br}, \text{I}$ ) have almost the same conformational energy-Explain.

3

(b) Draw the potential energy diagrams for the rotation around C-C bond of 1,2-dichloroethane.

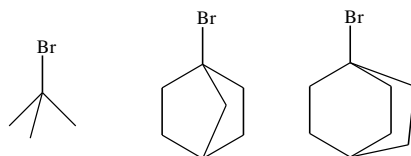
4

4 (a) Compare the nucleophilicity and basicity of methoxide and tertiarybutoxide ion.

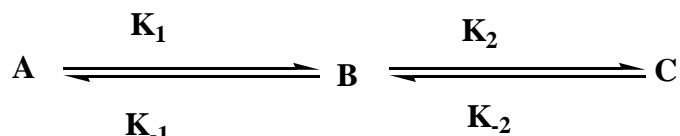
3

(b) Explain the relative rates of solvolysis (80% aq. Ethanol) for the following compounds.

4

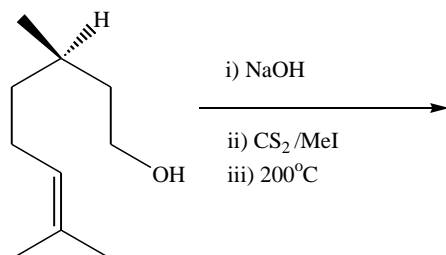


5.(a) Draw a reaction coordinate diagram for the following reaction in which 'C' is the most stable and 'B' is the least stable of the three species, and the transition state going from A to B is more stable than the transition state going from B to C. 4



- How many transition states are there?
- Which is the r.d.s. in the forward reaction?

(b) Predict the major product and suggest the mechanism. 3



6 (a) The  $S_N$  reaction of  $\text{EtSCH}_2\text{CH}_2\text{Cl}$  with ethanol proceeds at a rate many fold than  $\text{EtOCH}_2\text{CH}_2\text{Cl}$ - Explain. 3

(b) Treatment of alkyl iodide with  $\text{AgCN}$  yields alkyl isocyanides as major product whereas alkyl iodide gives alkyl cyanides mainly on treatment with potassium cyanide.-Explain. 4

7 (a) Between  $\text{CH}_3\text{CH}_2\text{CH}_2\text{Cl}$  and  $\text{CH}_3\text{OCH}_2\text{Cl}$ , which would react faster in  $S_N1$  solvolysis. 3

(b) Bromination ( $\text{Br}_2/127^\circ\text{C}$ , light) of isobutene gives 1% isobutyl bromide and 99% t-butylbromide but chlorination ( $\text{Cl}_2/25^\circ\text{C}$ , light) gives 67% of isobutyl chloride and 33% t-butylchloride-Explain the above observations. 4

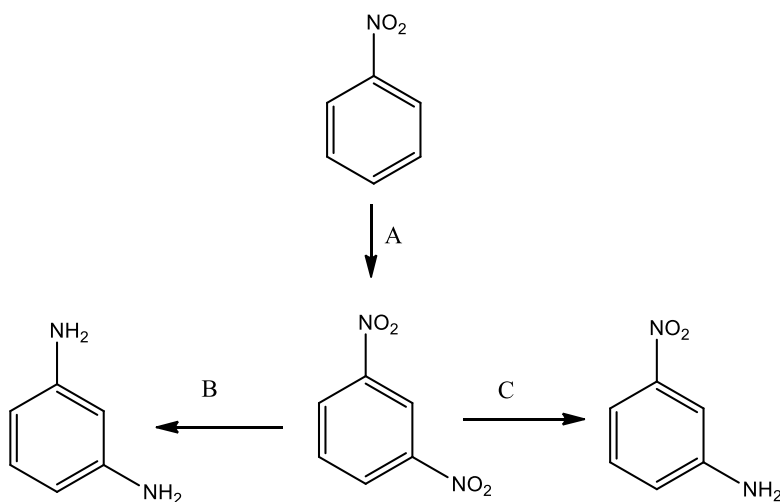
**2020**  
**B.A. /B.Sc. Semester 2 Examination**  
**University of Calcutta**  
**CHEMISTRY – HONOURS**  
**PRACTICAL**  
**Paper : CC3**  
**F.M. 15**

**FAKIR CHAND COLLEGE CENTRE(551)**

**Answer any 4 questions from 1 to 5**

3x4=12

1. What is condensation reaction? Give one example.
2. What is diazocoupling reaction? Give one example.
3. Write the mechanism of alkali hydrolysis of benzamide.
4. What is brine solution? Explain the use of this solution in benzoylation of amines.
5. Identify A and B and C for the following transformation.



6. Laboratory proficiency / Laboratory note book

3

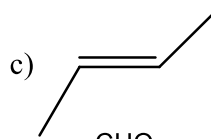
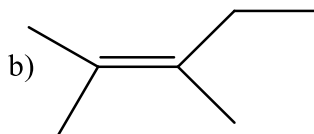
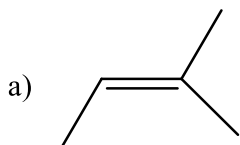
**2020**  
**B.A. /B.Sc. Semester 2 Examination**  
**University of Calcutta**  
**CHEMISTRY – HONOURS**  
**INTERNAL EXAMINATION**  
**Paper : CC3**  
**F.M. 10**

**FAKIR CHAND COLLEGE CENTRE(551)**

**Choose the correct option in each case and report (no need to write the answer in sentence):**

**1x10**

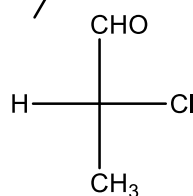
1. Most stable conformation of 1,2-difluoroethylene is  
 a) Staggered form b) gauche form c) eclipsed form d) none of these
2.  $S_N1$  reaction takes place with  
 a) Inversion of configuration b) retention of configuration c) racemisation d) resolution
3. Which reacts faster in  $S_N1$  reaction  
 a) Tertiary butyl chloride b) Isopropyl chloride c) Ethyl chloride d) Methyl chloride
4. Base catalysed dehydration of aldol undergoes the path  
 a)  $E_2$  b)  $E_1$  c)  $E_{1cb}$  d) None of these
5. Which reacts faster in  $S_N2$  Path ?  
 a)  $CH_3Br$  b)  $CH_3Cl$  c)  $CH_3F$  d)  $CH_3I$
6. Which is the correct topic face of acetone?  
 a) diastereotopic b) homotopic c) enantiotopic d) none of these
7. Which molecule shows geometrical isomer?



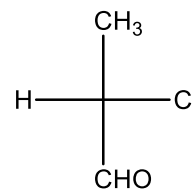
d) none of these

8. Relationship between the molecules

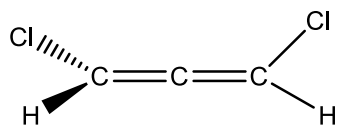
- a) Homomer b) Enantimer c) Diastereomer  
 d) None of these



and



9. The following molecule is an example of a) Symmetry allene b) Asymmetry allene  
 c) Dissymmetry allene d) None of these



10. Absolute configuration of the molecule is a) R b) S c) E d) Z

