B.A. / B.Sc. SEMESTER 4 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 The pdf 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 4 Examination
University of Calcutta
CHEMISTRY – HONOURS
THEORETICAL
Paper : CC8
F.M. 25

FAKIR CHAND COLLEGE CENTRE(551)

Answer ANY THREE from Question Nos. 1 to 5. Question No. 6 is COMPULSORY. Brief and to the point answer is desirable.

1. a) What do you mean by chromophore and auxochrome in terms of absorption of light for an organic molecule? Explain with suitable examples of one each. $1^1/_2+^1/_2+1^1/_2+^1/_2$

   b) Calculate λ_{max} during UV spectroscopy of CH_3-CH=CH-CH=CH-CHO using Woodward's rule. 3

2. a) In IR spectroscopy which type of vibration occurs in lower frequency range, stretching or bending? Why? $1^1/_2+2^1/_2$

   b) Discuss the effect of H-bonding in IR spectroscopy using a suitable example. 3

3. a) What do you mean by chemical shift in ^{1}H-NMR spectroscopy? Explain with suitable example. 2+2

   b) Discuss in brief the basic principle of ^{1}H-NMR spectroscopy (no illustration necessary). 3

4. a) Write short notes on synthon and synthetic equivalent (only definition with one example). 2+2

   b) What do you mean by illogical electrophile? Discuss with a suitable example. 3

5. a) Write a brief note on Beckmann Rearrangement. 3

   b) Discuss only schematically the separation procedure of amines by Hinsberg's method. 4

6. **Answer ANY FOUR:** 1+1+1+1

   a) Define enantioselectivity.

   b) What do you mean by umpolung? Answer using a suitable example.

   c) Write the outline of Lossen Rearrangement (mechanism not required).

   d) Write down the substrate and product of Orton Rearrangement.

   e) A ketone R_1R_2CO reacts in presence of a peroxyacid or peroxide to produce an ester R_1COOR_2. Give the name of this reaction.

   f) Define Bathochromic shift briefly.

2020

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University of Calcutta

CHEMISTRY – HONOURS

PRACTICAL

Paper : CC8

F.M. 15

FAKIR CHAND COLLEGE CENTRE(551)

Answer ANY FOUR from Question Nos. 1-5.

1. Phenolic –OH on reaction with Ferric Chloride solution produces a purple/green/wine red colour – Explain the change with proper reaction. Why alcoholic –OH does not give similar type of reaction with Ferric Chloride? 2+1
2. Give the principle of Mullikan-Barker reaction with aromatic nitro group (no reaction necessary). What is the basic difference of this method and the nitro group detection method using azo dye test (after reduction)? 2+1
3. Write down the reactions of azo dye test of aromatic primary amine (no illustration needed). What happens if ethylamine is used as substrate of this reaction instead of phenylamine? 2+1
4. Write down the reaction between a carbonyl group and Brady's reagent. Give the product when a carbonyl compound reacts with semicarbazide hydrochloride instead of 2,4-DNP. 2+1
5. What is Tollen's reagent? How is it prepared? 1+2
6. Laboratory Proficiency / Laboratory Notebook 3

2020
B.A. /B.Sc. Semester 4 Examination
University of Calcutta
CHEMISTRY – HONOURS
INTERNAL EXAMINATION
Paper : CC8
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):

1. The pH range of Brady's reagent is
   a) Alkaline b) Acidic c) Neutral
2. $RCONH_2$ reacts with $Br_2 / \overline{O}H$ to produce
   a) RNH_2 b) RCH_2NH_2 c) RCONHBr
3. The product of Arndt-Eistert synthesis with RCH_2COOH is
   a) RCOOH b) RCH_2CH_2COOH c) CH_3COOH
4. The illogical electrophile found by disconnection of $R_1COCH_2CH_2CH_2CH_2COR_2$ is
   a) $RCOCH_2CH_2\overline{C}H_2$ b) $RCOCH_2\overline{C}H_2$ c) Both (a) and (b)
5. R-N=C=O is the intermediate of
   a) Curtius rearrangement b) Schmidt rearrangement c) Both (a) and (b)
6. If we compare the O-H stretching frequency of 2-hydroxybenzoic acid and 4-hydroxybenzoic acid it is observed that
   a) the frequency is lower for 2-hydroxybenzoic acid
   b) the frequency is lower for 4-hydroxybenzoic acid
   c) the frequency is in the same range for both the compounds
7. The correct sequence of energy requirement for electronic excitation during UV spectroscopy is
   a) $\sigma \rightarrow \sigma^* > \pi \rightarrow \pi^* > n \rightarrow \pi^*$
   b) $\pi \rightarrow \pi^* > \sigma \rightarrow \sigma^* > n \rightarrow \pi^*$
   c) $\sigma \rightarrow \sigma^* > n \rightarrow \pi^* > \pi \rightarrow \pi^*$
8. During azo dye test of aromatic primary amine the pH range should be
   a) Basic b) Acidic c) does not depend on pH
9. The full name of 2,4-DNP.HCl is
   a) 2,4-Dinitrophenol hydrochloride b) 2,4-Dinitrophenylhydroxylamine hydrochloride
   c) 2,4-Dinitrophenylhydrazine hydrochloride
10. $C_6H_5NHCH_3$ in condition of diazotization produces
    a) diazonium salt b) Nitrosamine c) does not react