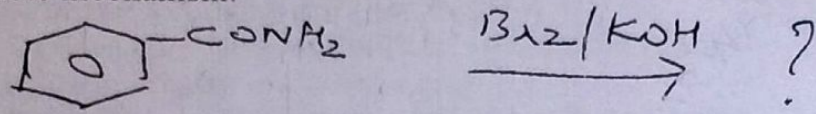


- N.B. : (1) All questions are compulsory.
(2) Figures to the right indicate full marks.
(3) Answers to the two sections should be written on separate answer-books and tied together.
(4) Use of log tables/non-programmable calculators is permitted.

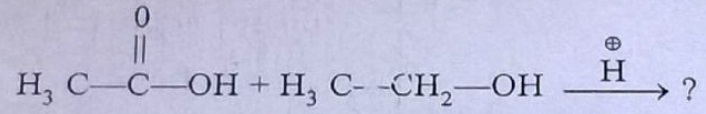
Section I

1. Answer any three of the following :—

- (A) Complete the following reaction, name the reaction involved and suggest a suitable mechanism. 5



- (B) (a) Give the mechanism involved in the formation of an acetal. 3
(b) Distinguish between nucleophilicity and basicity. 2
(C) What is Michael addition? Give an example and write its mechanism. 5
(D) Explain regioselectivity in elimination reaction with suitable examples. 5
(E) (a) Explain the mechanism involved in the following reaction : 3



- (b) Give a synthetic application of crossed Claisen condensation. 2
(F) (a) What is a thermodynamically controlled reaction? Give any two examples. 3
(b) Explain the stereochemistry of Beckmann rearrangement. 2

2. Answer any three of the following :—

- (A) Explain formation of Mannich base and Hantzsch synthesis of pyridine. 5
What are such syntheses called? Why?
(B) Write synthesis of the following:— 5
(a) Bifenox I
(b) Chiral synthesis of ibuprofen.
(C) Explain the use of microwaves in organic synthesis with any two examples. 5
(D) Give an account of electrophilic substitution reactions of furan. 5
(E) (a) Explain aromaticity of thiophene. 3
(b) Give Paal-Knorr synthesis of pyrrole. 2
(F) (a) Explain Hofmann exhaustive methylation followed by Hofmann elimination using piperidine as the starting compound. 3
(b) Write acid catalyzed ring opening reaction of furan. 2

[TURN OVER

3. (A) Complete the following statements by choosing the correct answer from the alternatives provided :— 4

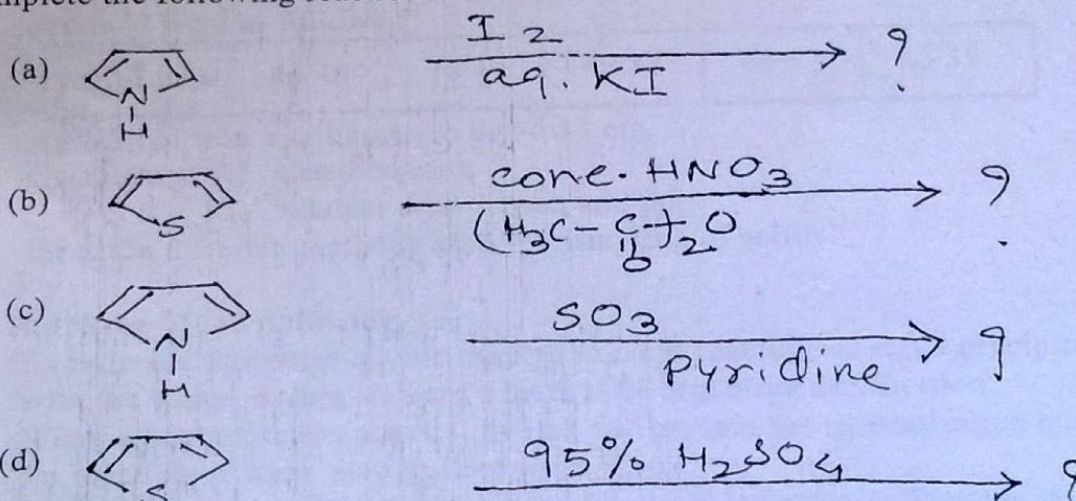
- (a) Addition of HBr to 1, 3-butadiene gives _____ product at -80°C
(1, 4 addition, 1, 2 addition, 2, 3 addition)
- (b) E2 reaction requires _____ conformation.
(synclinal, antiperiplanar, synperiplanar)
- (c) Saponification takes place through _____ mechanism.
(AAC¹, BAC¹, BAC²)
- (d) Lewis acids exhibit _____ character.
(nucleophilic, electrophilic, basic)

OR

(A) State whether the following are **true** or **false** :— 4

- (p) Tertiary alkyl halides prefer to undergo E1 reaction.
- (q) Electrophilicity is a kinetic property.
- (r) Sulphonation of naphthalene is kinetically controlled at high temperature.
- (s) In pinacol-pinacolone rearrangement, alkyl group migrates in preference to aryl group.

(B) Complete the following reactions. 4



OR

(B) Match the columns appropriately :— 4

Compounds	uses
(p) Vanillin	Hormone
(q) Bifenox I	Antibiotic
(r) L-ascorbic acid	Herbicide
(s) Paracetamol	Flavouring agent
	Antipyretic analgesic
	Vitamin

[TURN OVER

Section II

Answer any **three** of the following :—

(A) Discuss sourcewise classification of determinate errors with suitable examples of each class. 5

(B) pH of the water sample was determined at different intervals. The results obtained were as follows :— 5

Trial No.	1	2	3	4	5	6
pH	8.10	8.22	8.12	8.16	8.24	8.23

Calculate : (i) standard deviation.

(ii) relative average deviation from mean in pph and ppt.

(C) (a) Explain the terms : (i) bulk ratio (ii) size to weight ratio and give their significance in sampling. 3

(b) Define the terms : 2

(i) increment (ii) sampling unit

(D) What is sampling ? Discuss the sampling of heterogeneous liquids. 5

(E) Six samples of an iron ore were analysed for its iron content. The results obtained were as follows : 5

mg of iron	46.46	46.40	46.32	46.42	46.39
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Amount of iron was known to be 46.38 mg.

Calculate : (i) absolute error

(ii) relative error in pph and ppt.

(F) Describe different methods used for sampling of solids. 5

5. Answer any **three** of the following :— 15

(A) Explain the various methods used to prevent reaction of AgCl precipitate with the titrant during Volhard's method of argentimetric titration.

(B) What is neutralisation curve ? Sketch and explain the neutralisation curve for titration of weak acid against weak base.

(C) With reference to UV-visible spectroscopy, explain the calibration curve method. Describe the applications of UV-visible spectroscopy in qualitative analysis.

(D) Describe the construction and working of single beam spectrophotometer with the help of a neat labelled diagram.

(E) For an acid base titration involving 10 cm³ of 0.1M HCl with 0.1 M NaOH, Calculate the pH.

(i) in the beginning of titration

(ii) after addition of 5 cm³ of NaOH

(iii) after addition of 10 cm³ of NaOH.

(F) What are argentimetric titrations ? Discuss the use of adsorption indicators in detecting end point in argentimetric titrations.

[TURN OVER

(A) Fill in the blanks :

4

- (a) Selection of sample in a definite sequence at regular intervals is called _____ sampling.
- (b) Sample is collected with help of _____.
- (c) The errors whose cause cannot be located are called _____ errors.
- (d) The errors in which absolute error is independent of sample size are _____ errors.

OR

4

(A) State true or false :

- (p) High precision is not the guarantee of high accuracy.
- (q) Precision represents reliability of the result.
- (r) Ambient sampling is sampling of air.
- (s) Fluxes are used for decomposition of samples.

3

(B) Fill in the blanks :

- (a) Any acid-base titration essentially involves _____ reaction.
- (b) The indicator used in Mohr's method is _____.
- (c) Prisms and gratings are used as _____ in UV-visible spectrophotometer.

OR

3

(B) State true or false :

- (p) A photocathode is capable of emitting electrons due to light incident on its surface.
- (q) A single beam spectrophotometer is advantageous than a double beam spectrophotometer.
- (r) Eosin is used as an indicator in acid base titration.

—————v—————