Chem - II
Org. Any.
8/10

QP Code : **12778**

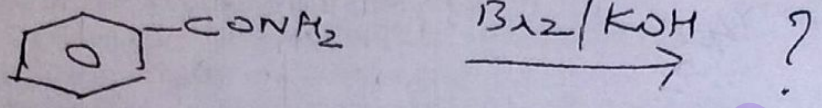
(2½ Hours) [Total Marks : 75

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

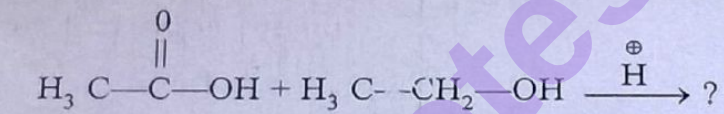


(B) (a) Give the mechanism involved in the formation of an acetal. 3
(b) Distinguish between nucleophilicity and basicity. 2

(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 reaciton : 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. What are such syntheses called ? Why ? 5

(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 compond. 3
(b) Write acid catalyzed ring opening reaction of furan. 2

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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.
(AAC^1, BAC^1, BAC^2)

(d) Lewis acids exhibit _____ character.
(nucleophilic, electrophilic, basic)

OR

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

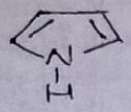
(p) Tertiary alkyl halides prefer to undergo E1 reaction.

(q) Electrophilicity is a kinetic property.

(r) Sulphonation of naphthalene is kinetically controlled at high temperature.

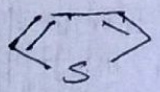
(s) In pinacol-pinacolone rearrangement, alkyl group migrates in preference to aryl group.

(B) Complete the following reactions. 4

(a)  $\xrightarrow[aq.\ KI]{I_2}$?

(b)  $\xrightarrow[(H_3C-\overset{O}{\overset{\|}{C}}-)_2O]{conc.\ HNO_3}$?

(c)  $\xrightarrow[Pyridine]{SO_3}$?

(d)  $\xrightarrow{95\%\ H_2SO_4}$?

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

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

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 cm^3 of 0·1M HCl with 0·1 M NaOH, Calculate the pH.
(i) in the beginning of titration
(ii) after addition of 5 cm^3 of NaOH
(iii) after addition of 10 cm^3 of NaOH.

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

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(A) Fill in the blanks :

(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.

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