Total No. of Printed Pages—8

4 SEM TDC CHM M 3

2023

(May/June)

CHEMISTRY

(Major)

Course : 403

(Organic Chemistry)

Full Marks : 48

Pass Marks : 14

Time : 2 hours

The figures in the margin indicate full marks for the questions

1. Choose the correct answer from the following : 1×5=5

(a) Anthracene may be synthesized by

(i) Haworth method

(ii) Elbs method

(iii) Both *(i)* and *(ii)*

(iv) None of the above

(b) The poisonous alkaloid isolated from poison hemlock is

(i) piperine

(ii) coniine

(iii) nicotine

(iv) hygrine

(c) Which of the following amino acids is optically inactive?

(i) Glycine

(ii) Alanine

(iii) Phenylalanine

(iv) Lysine

(d) Chichibabin reaction of pyridine gives

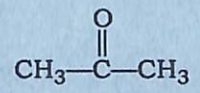
(i) 3-aminopyridine

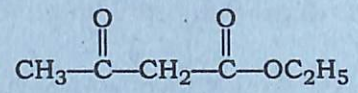
(ii) 2-aminopyridine

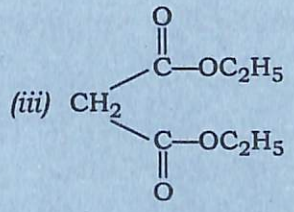
(iii) 4-aminopyridine

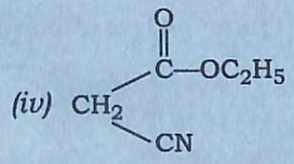
(iv) piperidine

(e) Which of the following has the highest K_a value?

(i) 

(ii) 

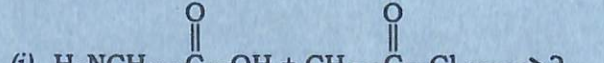
(iii) 

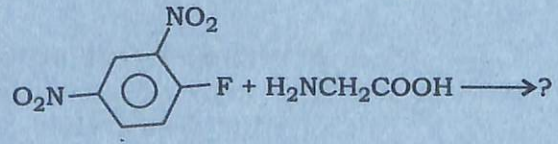
(iv) 

2. Answer any *five* from the following : 2×5=10

(a) How will you prepare uracil from ethylacetoacetate?

(b) Complete the following reactions : 1+1=2

(i) 

(ii) 

(c) What happens when 1°, 2° and 3° amines react with HNO_2?

(d) How can phenanthrene be synthesised by Bardhan-Sengupta method?

(e) Discuss Paal-Knorr synthesis method for the preparation of five membered heterocyclic compounds.

(f) Aniline cannot be prepared by Gabriel phthalimide synthesis. Explain.

(g) Write a short note on classification of alkaloids.

UNIT—I

3. (a) Starting from diethylmalonate, how will you prepare an α, β-unsaturated carboxylic acid? 1

(b) Give mechanism : 2

$$CH_3COOC_2H_5 \xrightarrow[H^{\oplus}]{C_2H_5ONa} CH_3-\overset{O}{\overset{\|}{C}}-CH_2-\overset{O}{\overset{\|}{C}}-OC_2H_5$$

(Ethyl acetoacetate)

Or

What is keto-enol tautomerism? Write down the keto and enol tautomeric forms of ethyl acetoacetate. 1+1=2

UNIT—II

4. (a) Complete the following reactions (any *three*) : 1×3=3

(i) $(CH_3)_2NH + HNO_2 \longrightarrow$

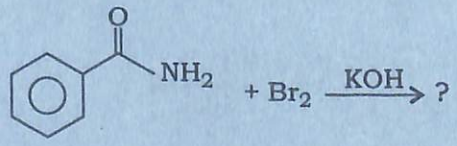
(ii) $RNC \xrightarrow[HgO]{[O]}$

(iii) $C_6H_5COCH_3 + HCHO + (CH_3)_2NH \longrightarrow$

(iv) $CH_2N_2 \xrightarrow{CH_3-\overset{O}{\overset{\|}{C}}-CH_3}$

(b) What happens when an alcoholic solution of KOH and $CHCl_3$ is heated with aniline? 1

(c) Name the following reaction and give mechanism : 1+2=3



UNIT—III

5. (a) How will you prepare alanine by Strecker's synthesis? What happens when alanine reacts with ninhydrin? 1½+1½=3

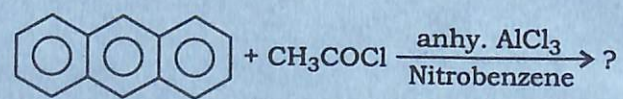
Or

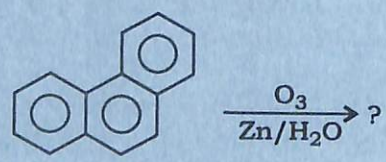
What is isoelectric point of amino acid? Explain briefly about the electrophoresis of amino acids. 1+2=3

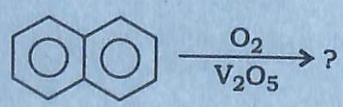
(b) Explain briefly about the tertiary structure of protein. 2

UNIT—IV

6. *(a)* Complete the following reactions (any *two*) : 1×2=2

(i) 

(ii) 

(iii) 

(b) Convert the following (any *one*) : 2

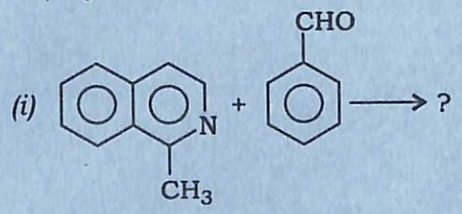
(i) Naphthalene to anthracene

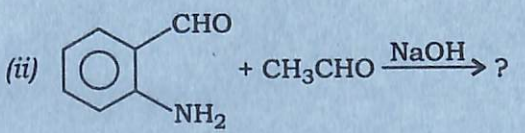
(ii) Anthracene to alizarin

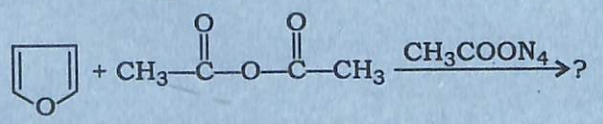
UNIT—V

7. *(a)* Pyrrole shows aromatic character and gives electrophilic aromatic substitution reactions. Explain why. 2

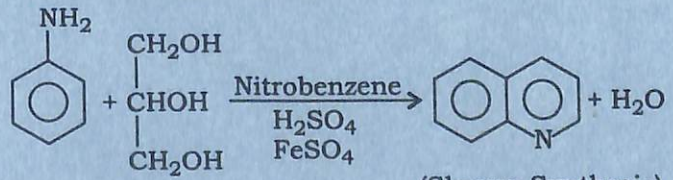
(b) Complete the following reactions (any *two*) : 1×2=2

(i) 

(ii) 

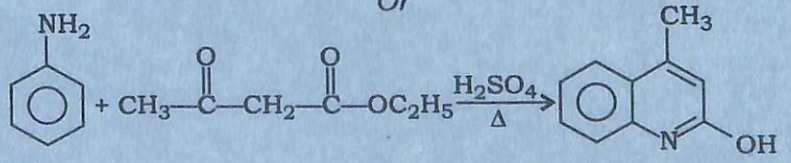
(iii) 

(c) Give mechanism : 3



(Skraup Synthesis)

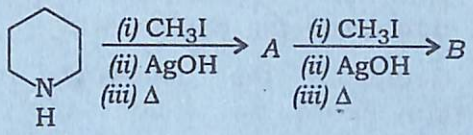
Or



(Knorr Synthesis)

UNIT—VI

8. *(a)* Complete : 2



(b) Discuss the relevance of Hofmann exhaustive methylation method in structure elucidation of nicotine. 2

Or

Discuss the Spath and Bretschneider's synthesis of nicotine.

(c) Explain Emde's modification in case of alkaloids with the help of an example. 2

(d) Write one medicinal use of either reserpine or cocaine. 1

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