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4 SEM TDC CHMH (CBCS) C 9

2024

(May/June)

CHEMISTRY

(Core)

Paper : C-9

(Organic Chemistry)

Full Marks : 53

Pass Marks : 21

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

1. Choose the correct answer from the following : 1×4=4
- (a) When acetamide is converted to methanamine, the name of the reaction is
- (i) Curtius reaction
 - (ii) Michael reaction
 - (iii) Hofmann reaction
 - (iv) Hinsberg reaction

(2)

(b) Which of the following is not an aromatic compound?

(i) Furan

(ii) Pyrrole

(iii) Piperidine

(iv) Pyridine

(c) Which one out of the following is not an alkaloid?

(i) Nicotine

(ii) Ephedrine

(iii) Adrenalin

(iv) Quinine

(d) How many isoprene units are there in diterpene?

(i) 1

(ii) 2

(iii) 3

(iv) 4

(3)

2. Answer any *four* of the following questions :

2×4=8

(a) How will you convert aniline into *m*-dinitrobenzene? Give the chemical equation.

(b) Discuss the basicity of 1°, 2° and 3° amines in aqueous system.

(c) Out of pyrrole and furan, which is more aromatic?

(d) Thiophene is more aromatic in nature than furan. Explain.

(e) What is the difference between terpenes and terpenoids?

UNIT—I

3. Answer any *three* of the following questions :

3×3=9

(a) Discuss the influence of nitro group upon the basicity of substituted aniline.

3

(4)

(b) Write short notes on any two of the following : $1\frac{1}{2} \times 2 = 3$

(i) Gabriel phthalimide synthesis

(ii) Schotten-Baumann reaction

(iii) Hinsberg test for 1°, 2° and 3° amines

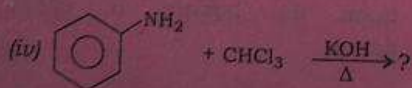
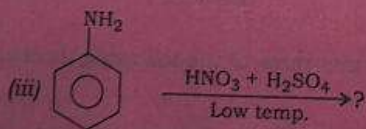
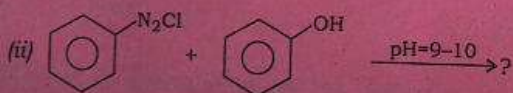
(c) Complete the following reactions : $1\frac{1}{2} \times 2 = 3$

(i) *N*-nitroso-*N*-methyl aniline from *N*-methylaniline

(ii) Benzoic acid from aniline

(d) Complete the following reactions (any three) : $1 \times 3 = 3$

(i) $\text{CH}_3\text{COCH}_2\text{CH}_3 + \text{CH}_2\text{O} + (\text{CH}_3)_2\text{NH} \longrightarrow ?$



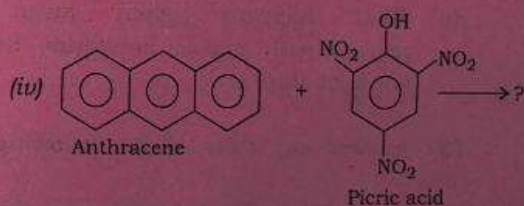
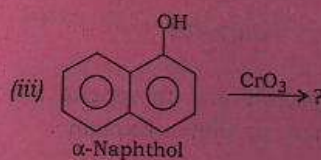
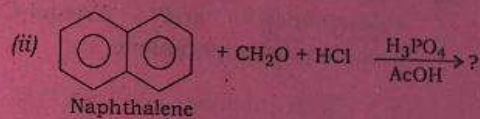
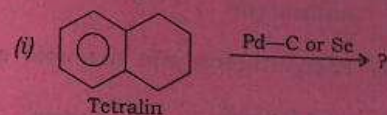
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(5)

UNIT—II

4. Answer any three of the following questions : $3 \times 3 = 9$

(a) Complete the following reactions (any three) : $1 \times 3 = 3$



(b) Explain why, electrophilic substitution of naphthalene takes place mainly at α -position (C-1).

(6)

- (c) How will you convert any *two* of the following? $1\frac{1}{2} \times 2 = 3$
- (i) Naphthalene into Decalin
- (ii) Anthracene into 9-formyl-anthracene
- (iii) Phenanthrene into diphenic acid
- (d) Describe the orientation of sulphonation and Friedel-Crafts acylation in naphthalene. $1\frac{1}{2} \times 2 = 3$

UNIT—III

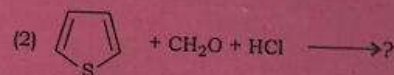
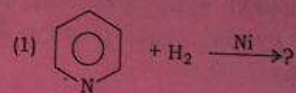
5. (a) Furan, pyrrole and thiophene are less basic than pyridine. Explain. 2
- (b) What happens when furan is reacted with maleic anhydride under sunlight (hv)? 2
- (c) Answer any *three* of the following : $2 \times 3 = 6$
- (i) Prepare pyrrole from acetylene.
- (ii) What happens when furfural is treated with acetic anhydride and sodium acetate?

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(Continued)

(7)

- (iii) Complete the following reactions : $1 \times 2 = 2$



- (iv) Convert the following : $1 \times 2 = 2$
- (1) Pyrrole from furan
- (2) Pyridine from piperidine

- (d) Pyridine, though aromatic like benzene, can undergo nucleophilic substitution easily, while benzene cannot. Explain. 2
- (e) What happens when furoic acid is heated up to 200 °C–205 °C? 1

UNIT—IV

6. (a) What are alkaloidal reagents? 1
- (b) Explain Hofmann elimination and Emde degradation. How will you differentiate between these two? 2

Or

How will you convert nicotin into hygrinic acid?

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- (c) How will you establish that in nicotine *N*-methyl pyrrolidine ring is attached to pyridine at position-3 via its α -position? 2

UNIT—V

7. (a) What is isoprene rule? Explain with suitable example. 1
- (b) Establish the structure of citral. Give its synthesis. 2

Or

Discuss the structure of α -Terpineol.

- (c) How will you synthesize of the following (any one)? 2
- (i) α -Terpineol from α -pinene
- (ii) Nerol from Neral
