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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)

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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

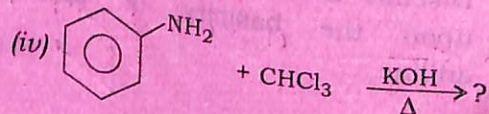
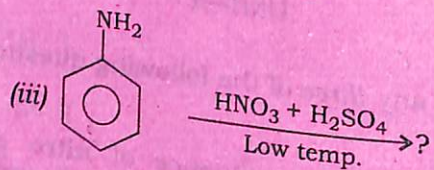
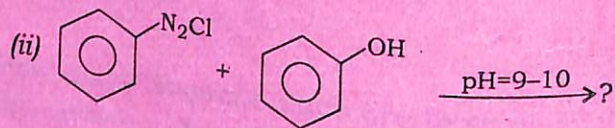
(c) Complete the following reactions : $1\frac{1}{2} \times 2 = 3$

(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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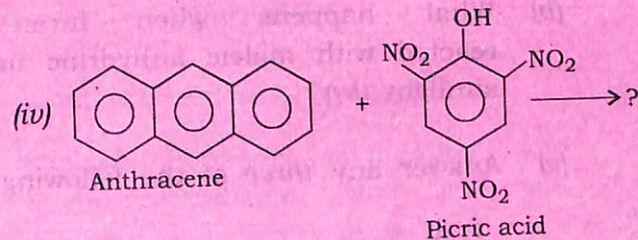
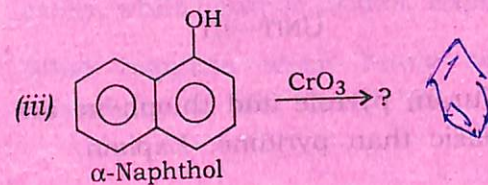
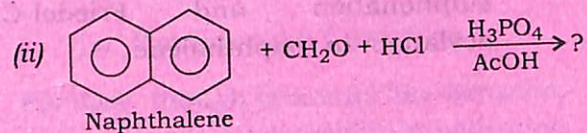
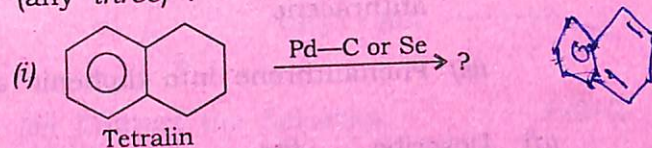
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(5)

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).

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(Turn Over)

(6)

(c) How will you convert any *two* of the following?
1½×2=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.
1½×2=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 (*hν*)? 2

(c) Answer any *three* of the following :
2×3=6

(i) Prepare pyrrole from acetylene.

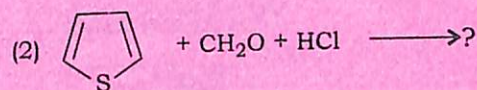
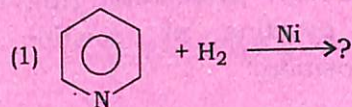
(ii) What happens when furfural is treated with acetic anhydride and sodium acetate?

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(7)

(iii) Complete the following reactions :
1×2=2



(iv) Convert the following : 1×2=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 nicotine into hygrinic acid?

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(Turn Over)

- (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

