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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 methan-amine, 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

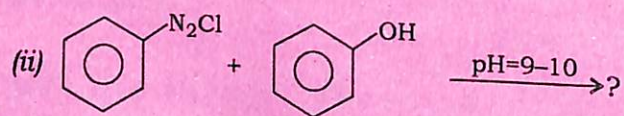
(c) Complete the following reactions : $1\frac{1}{2} \times 2 = 3$

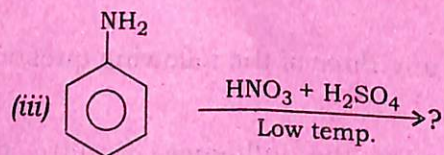
(i) *N*-nitroso-*N*-methyl aniline from *N*-methylaniline

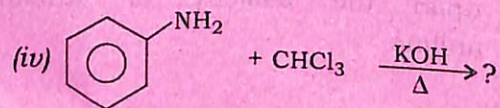
(ii) Benzoic acid from aniline

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

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

(ii)  $\xrightarrow{\text{pH}=9-10} ?$

(iii)  $\xrightarrow[\text{Low temp.}]{\text{HNO}_3 + \text{H}_2\text{SO}_4} ?$

(iv)  $\xrightarrow[\Delta]{\text{KOH}} ?$

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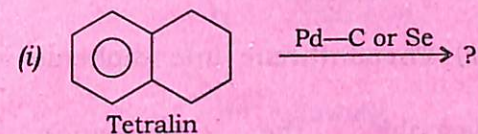
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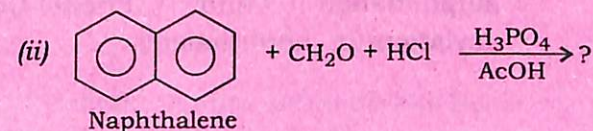
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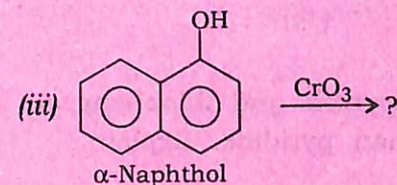
UNIT—II

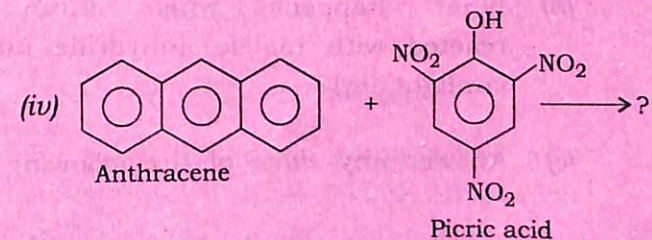
4. Answer any *three* of the following questions : $3 \times 3 = 9$

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

(i)  $\xrightarrow{\text{Pd-C or Se}} ?$
Tetralin

(ii)  $\xrightarrow[\text{AcOH}]{\text{H}_3\text{PO}_4} ?$
Naphthalene

(iii)  $\xrightarrow{\text{CrO}_3} ?$
α-Naphthol

(iv)  $\longrightarrow ?$
Anthracene
Picric acid

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

3

24P/1280

(Turn Over)

(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 (*h\nu*)? 2

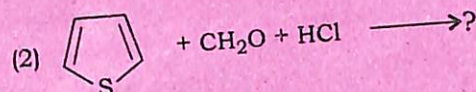
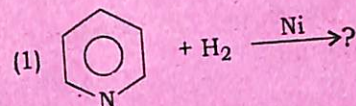
- (c) Answer any *three* of the following : $2 \times 3 = 6$

(i) Prepare pyrrole from acetylene.

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

(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?

(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
