

**4 SEM TDC CHMH (CBCS) C 9**

**2 0 2 2**

( June/July )

**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) Naphthalene when reduced with sodium and isoamyl alcohol gives

(i) 1,4-Dialin

(ii) 1,2-Dialin

(iii) tetralene

(iv) decalene

(b) The hybridization of nitrogen atom in piperidine is

- (i)  $sp$
- (ii)  $sp^2$
- (iii)  $sp^3$
- (iv) unhybridized

(c) The fundamental unit in terpenes is

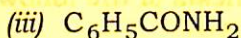
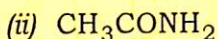
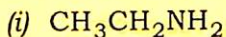
- (i) 1,3-Butadiene
- (ii) 2-Methyl-1,3-butadiene
- (iii) allene
- (iv) 1,2-Butadiene

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

- (i) Nicotine
- (ii) Ephedrine
- (iii) Adrenaline
- (iv) Quinine

2. Answer any *four* questions from the following : 2×4=8

(a) Explain and arrange the following in increasing order of basicity :



(b) How will you prepare benzenediazonium chloride? What happens when benzenediazonium chloride is treated with KCN?

(c) Explain why naphthalene is more reactive than benzene.

(d) Why is the electrophilic substitution in furan and other five-membered heterocycles are not carried in acidic medium?

(e) What is the structural formula of nicotine and hygrine?

UNIT—I

3. Answer any *three* questions : 3×3=9

(a) How would you distinguish among  $1^\circ$ ,  $2^\circ$  and  $3^\circ$  amines with the help of Hinsberg test? 3

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

(i) Gabriel phthalimide synthesis

(ii) Mannich reaction

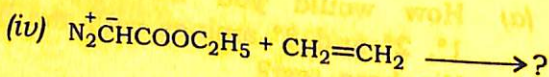
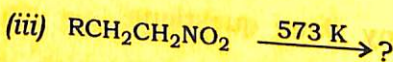
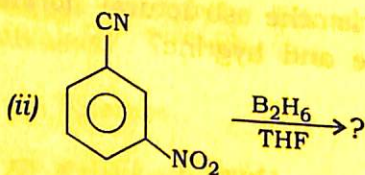
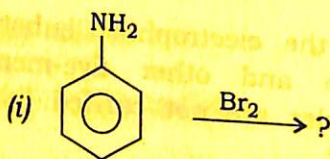
(iii) Carbylamine reaction

(c) Discuss the synthesis of the following :  $1\frac{1}{2} \times 2 = 3$

(i) Phenol from benzenediazonium chloride

(ii) *p*-Bromotoluene from *p*-toluidine

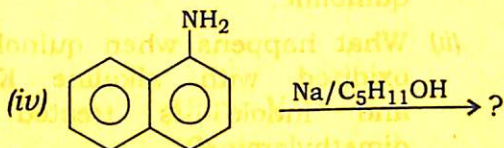
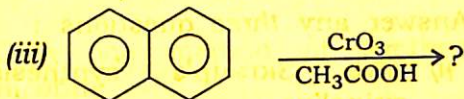
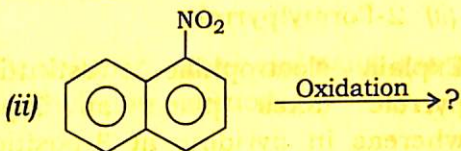
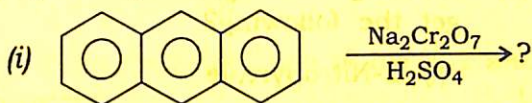
(d) Complete the following reactions (any *three*) :  $1 \times 3 = 3$



## UNIT—II

4. Answer any *three* questions : 3×3=9

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



(b) Explain why,  $\alpha$  substitution in naphthalene is more suitable than  $\beta$  substitution on monosubstitution. 3

(c) How will you convert any *two* of the following? 1½×2=3

(i) Benzene into naphthalene

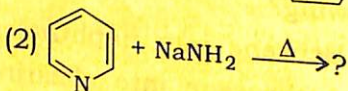
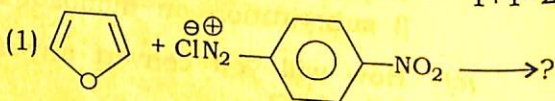
(ii) Anthracene into alizarin

(iii) Naphthalene into  $\beta$ -naphthol

(d) Write one method for the preparation of  $\alpha$ -naphthol. How does it react with ammonia? 2+1=3

## UNIT—III

5. (a) Which is more basic, pyrrole or pyridine? Explain. 2
- (b) Starting with pyrrole, how will you get the following? 1+1=2
- (i) 2-Nitropyrrole
- (ii) 2-Formylpyrrole
- (c) Explain electrophilic substitution in pyrrole takes place at 2-position whereas in pyridine at 3-position. 3
- (d) Answer any *three* questions : 2×3=6
- (i) Give Skraup's synthesis of quinoline.
- (ii) What happens when quinoline is oxidized with alkaline  $\text{KMnO}_4$  and indole is treated with dimethylamine? 1+1=2
- (iii) Complete the following reactions : 1+1=2



- (iv) Convert the following : 1+1=2
- (1) Thiophene from *n*-Butane
- (2) 3-Nitropyridine from pyridine

UNIT—IV

6. (a) What are alkaloidal reagents? Give examples. 1+1=2

Or

Give the medicinal use of hygrine and reserpine. 1+1=2

- (b) Describe in detail Hofmann exhaustive methylation method. 3

Or

Give one method of synthesis of nicotine. 3

UNIT—V

7. What is isoprene rule? Explain with example. Outline the synthesis of citral. 1+1+3=5

Or

What are terpenoids? How are they classified? Outline the synthesis of  $\alpha$ -terpineol. 1+1+3=5

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