

B.Sc./6th Sem/CEM/26(NEP)

2026

6th Semester Examination (CCFUP : NEP)

CHEMISTRY

Paper : MJ 13-T

(Single Core Major)

(Organic Chemistry-V)

Full Marks : 40

Time : Two Hours

The figures in the margin indicate full marks.

*Candidates are required to give their answers
in their own words as far as practicable.*

Group - A

Answer any *five* questions : $2 \times 5 = 10$

1. Naphthalene when reduced with H_2 and Ni gives two isomeric products. What are they? Write down their structures and conformations.
2. Compare the aromatic characters of thiophene, furan and pyrrole.
3. Define synthon and synthetic equivalent with examples.
4. What happens when *cis*- and *trans*-isomers of 3-hydroxycyclohexane carboxylic acid are heated separately?

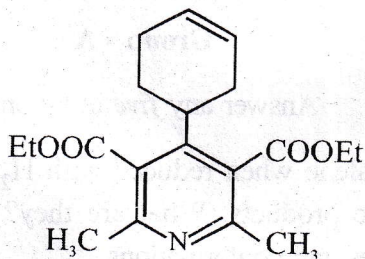
P.T.O.

5. Show the base pairings present in DNA.
6. Suggest a method for N-terminal determination of peptides.
7. Explain why NaOH is an unsuitable base for the deprotonation of diethyl malonate in alkylation reactions.
8. Why is pyridine referred to as π -deficient in comparison to benzene?

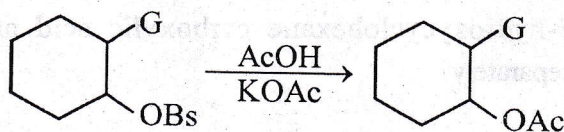
Group - B

Answer any **four** questions : 5×4=20

9. (i) Synthesize the following pyridine derivative using suitable disconnection approach :

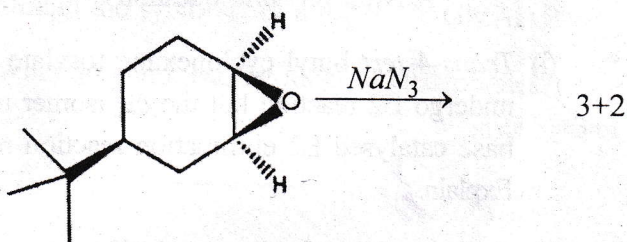


- (ii) What will happen when quinoline is treated with alkaline KMnO_4 followed by hydrolysis? 3+2
10. (i) How do you account for the following relative rates of acetolysis of 2-substituted cyclohexyl brosylates?



G	$K_{\text{trans}} / K_{\text{cis}}$
Cl	3.6
Br	833
I	2.7×10^6

- (ii) Write down the major product formed in the following reaction —



11. (i) Synthesize methionine following Strecker synthesis of amino acids.
- (ii) What is Dakin-West reaction? Illustrate your answer with suitable reaction mechanism. 2+3
12. (i) What is Fries rule? Explain with examples.
- (ii) What product will be formed when 2-naphthol is treated with $\text{C}_6\text{H}_5\text{N}_2^+\text{Cl}^-$ in alkaline medium? Explain with mechanism. 2+3
13. (i) How will you prepare glutaric acid ($\text{HOOC}-\text{CH}_2\text{CH}_2\text{CH}_2-\text{COOH}$) starting from diethyl malonate?

P.T.O.

- (ii) Write down the Bardhan-Sengupta synthesis of phenanthrene. 2+3

14. (i) How furfural is manufactured from pentosan?

- (ii) During Hantzsch synthesis of pyrrole, some furan derivative is formed. Explain how it is formed? 2+3

Group - C

Answer any *one* question : 10×1=10

15. (i) *Trans*-4-*tert* butyl cyclohexane tosylate does not undergo E2 reaction but the *cis* isomer undergoes base catalysed E2 elimination reaction readily — Explain.

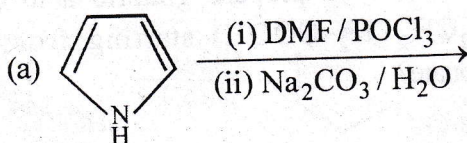
(ii) Convert : Naphthalene → Anthracene

(iii) Amino acids are weaker than carboxylic acids. — Explain.

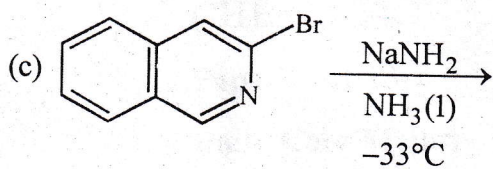
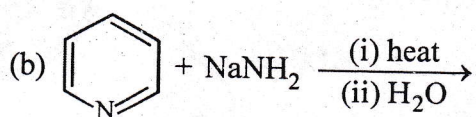
(iv) Write down the enzymatic method for the resolution of D, L-amino acids.

(v) Proline and hydroxyproline give yellow colour with ninhydrin. Explain. 2+2+2+2

16. (i) Write down the products of the following reactions with suitable mechanism :



(5)



(ii) Design the synthesis of a tripeptide Gly.Ala.Phe.

(iii) What do you mean by illogical electrophiles?

(2×3)+3+1
