

[4]

- ii) [1,3]-Sigmatropic shift of hydrogen is thermally forbidden but photochemically allowed.
- iii) [4+2]-cycloaddition is thermally allowed process.
2. a) Write down the Haworth projection of α -D-glucopyranose and β -D-fructofuranose. 2
- b) What is mutarotation? Explain with an example. 2
- c) Give two different methodologies of chemical synthesis of α -amino acid. 2
- d) How do you synthesize the dipeptide given below:
Z-(L)-Val-(L)-Ala-OH 2
- e) What are nucleoside and nucleotide? Write down the chemical structures of four nucleobases of DNA. 2

Ex/SC/CHEM/UG/CORE/TH/12/2024(S)

**B. SC. CHEMISTRY (SPECIAL SUPPLEMENTARY)
EXAMINATION, 2024**

(5th Semester)

CHEMISTRY (CORE)

PAPER: CORE/CHEM/TH/12

Time : Two Hours

Full Marks : 40

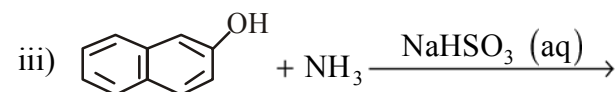
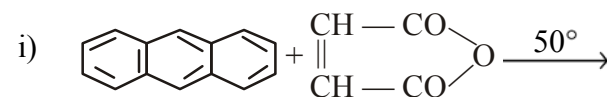
(20 marks for each unit)

Use a separate answer script for each unit.

The figures in the margin indicate full marks.

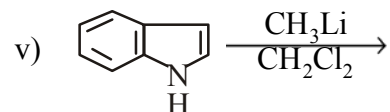
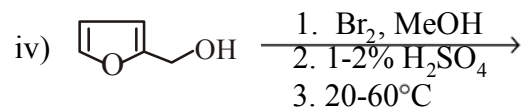
UNIT - 5121-O

1. a) Following the Haworth sucinylation, write the steps mentioning the reagents for the synthesis of 7-chloro-1-ethylnaphthalene. 2
- b) Predict the product(s) in the following reactions with plausible mechanism (*any four*): $1\frac{1}{2} \times 4$



[Turn over

[2]



c) Justify the following statement (any **one**) : 2

i) Pyridine N-Oxide undergoes both electrophilic and nucleophilic attacks at the same position.

ii) Naphthalene contains two benzene rings, fused together at the ortho positions.

2. a) Predict the product(s) formed when *cis*-2-quininocyclo-hexanol in dilute hydrochloric acid is treated with sodium nitrite. Give appropriate mechanistic and stereochemical explanations. 3

b) Compare with justification the rates of saponification of two diastereomeric ethyl 4-butyl cyclohexane-carboxylates. $2\frac{1}{2}$

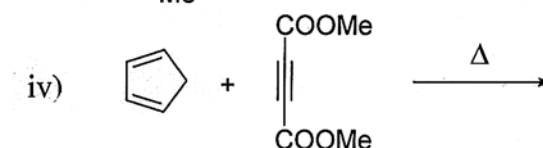
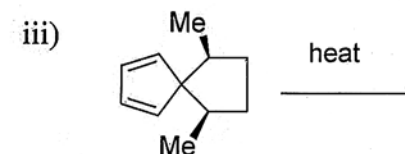
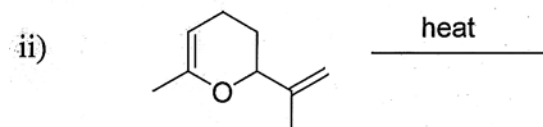
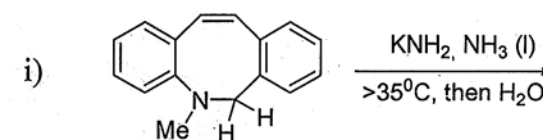
c) Draw the boat and twist-boat conformations of cyclohexane. Which one between these two is more stable one? Explain your answer. $2\frac{1}{2}$

d) Describe schematically resolution of racemic 2-hydroxypropanoic acid via formation of diastereomeric salts. Give also the chemical reaction(s) involved.

[3]

UNIT - 5122-O

1. a) Predict the product with proper stereochemistry of the following pericyclic reactions. Explain their formation on the basis of FMO approach with mechanism (any **three**) : 2×3



b) With the help of FMO analysis, explain the following statement (any **two**) : 2×2

i) *cis*-3,4-Dimethylcyclobutene on heating gives (2*Z*, 4*E*)-2,4-hexadiene while on photochemical condition the product is (2*E*, 4*E*)-2,4-hexadiene.

[Turn over