



UNIVERSITY OF NORTH BENGAL
B.Sc. Honours 3rd Semester Examination, 2020

CC6-CHEMISTRY

ORGANIC

Full Marks: 40

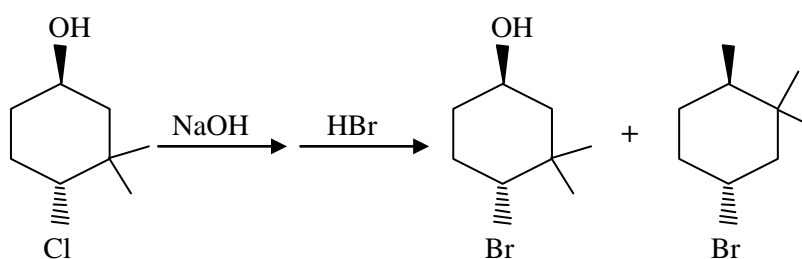
ASSIGNMENT

*The figures in the margin indicate full marks.
All symbols are of usual significance.*

Answer any four questions from the following

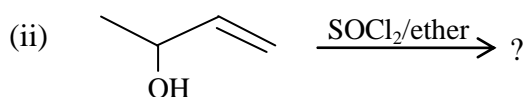
10×4=40

1. (a) Neopentyl chloride cannot be hydrolysed under normal conditions. — Explain. 2+2
What happens if drastic conditions are applied?
- (b) Provide a mechanistic rationalisation for the following reaction: 3

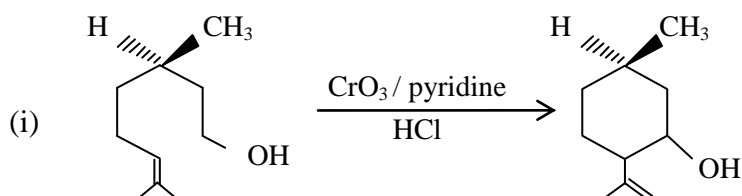


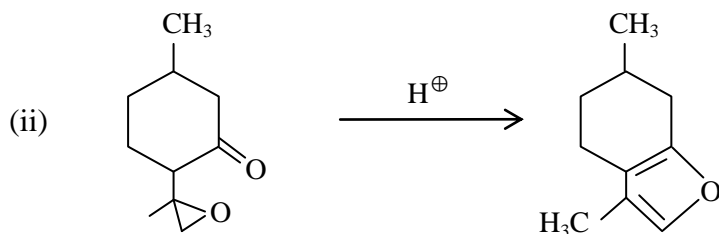
- (c) Anhydride used in Perkin reaction must have two α -hydrogens. Justify the statement. 3

2. (a) Predict the products and explain with mechanism: $2\frac{1}{2} \times 2$

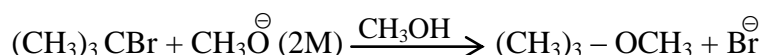
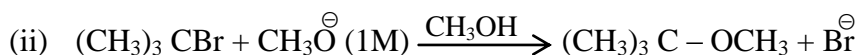
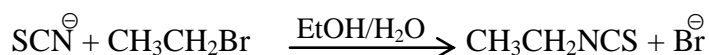


- (b) Give mechanism of each of the following transformations: $2\frac{1}{2} \times 2$

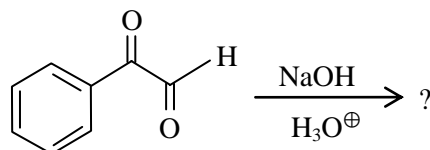




3. (a) Which reaction in each pair is expected to take place at a faster rate? — Why? 2+2



(b) Predict the major product with mechanism: 2



(c) Can you synthesize $(\text{CH}_3)_3\text{C}-\text{O}-\text{C}(\text{CH}_3)_3$ by Williamson's synthesis? If not, then how will you proceed? 2+2

4. (a) Acetals and Ketals are stable in alkali but susceptible to acid hydrolysis. — Explain. 3

(b) An alkyl halide reacts with OH^- to produce an alcohol but the reverse reaction does not occur. — Explain. Under what condition can an alcohol be transformed into alkyl halide? 2+2

(c) Explain why alkyl halides give cyanides with ethanolic KCN but isocyanides with AgCN . 3

5. (a) Give experimental evidence for the following mechanisms: 2+2

(i) $\text{A}_{\text{AL}}1$

(ii) $\text{A}_{\text{AC}}1$

(b) Ethers like ROR can be cleaved by conc. HI but not by HCl. — Explain. 2

(c) The condition for formation of methyl ester of mesitoic acid is different from the condition of formation of methyl ester of benzoic acid. Explain mechanistically. 3

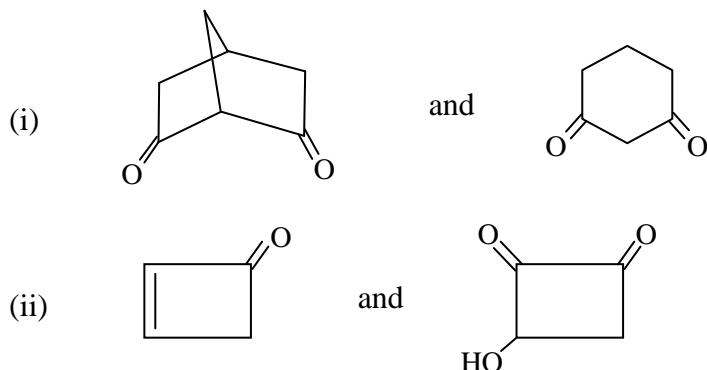
(d) Define tautomerism. 1

6. (a) What will be the product(s) if R_3COH is treated with H_2O_2 and H^+ ? Explain mechanistically. 2 $\frac{1}{2}$

(b) Several $\text{S}_{\text{N}}1$ reactions give complete racemization while in several cases there is typically 5-20% inversion. — Explain. 2 $\frac{1}{2}$

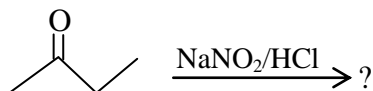
- (c) Predict the two isomeric products obtained from the reaction of methyl benzyl ketone and methyl vinyl ketone. Explain mechanistically. 2
- (d) During the synthesis of benzilic acid, one has taken furil by mistake. Does the reaction proceed in the forward direction? If so, what product do you expect? Write the reaction mechanism. 3

7. (a) Which compound in each of the following pairs would be more extensively enolised? — Why? 2+2



- (b) Synthesize CH_3CDO from CH_3CHO . 2
- (c) Esters like ethyl isobutyrate cannot be made to undergo Claisen condensation using NaOEt . — Why? What is the alternative? 2+2

8. (a) Predict the product mechanistically: 2



- (b) Explain why we cannot synthesize 3-methylhexan-2-ol by Clemmensen reduction of 4-methyl-5-hydroxyhexan-3-one. 2
- (c) Prepare the following starting from ethyl acetoacetate. 2×3=6
- (i) 4-oxopentanoic acid, (ii) cinnamic acid, (iii) 3-pentanone.

—x—