



WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 3rd Semester Examination, 2021-22

CEMACOR07T-CHEMISTRY (CC7)

ORGANIC CHEMISTRY-III

Time Allotted: 2 Hours

Full Marks: 40

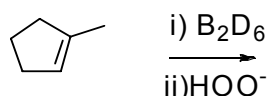
*The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.*

Answer any four questions taking one from each unit

UNIT-I

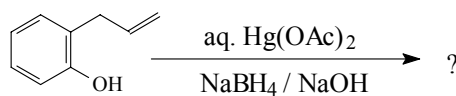
1. (a) Explain showing the mechanism why methyl vinyl ketone readily epoxidizes in presence of alkaline hydrogen peroxide than in presence of a peroxy acid? 2

- (b) Predict the product and explain mechanistically 2

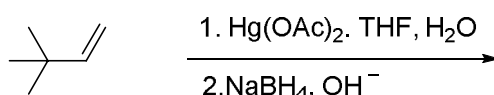
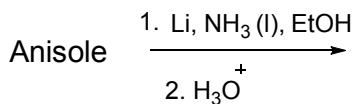


- (c) Starting from *E*-butene, discuss the method of preparation of *meso*-butane-2,3-diol and *dl*-butane-2,3-diol separately? Mention the reagents and stereochemistry of the reactions in each case. 3

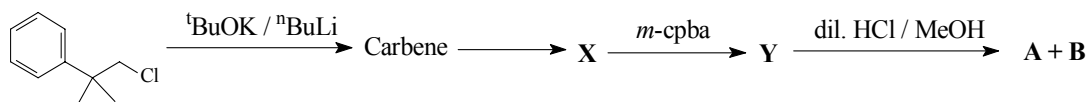
- (d) Predict the product with mechanism indicating the major one in the following reaction: 3



2. (a) Predict the product (with mechanism) of the following reactions 2+2



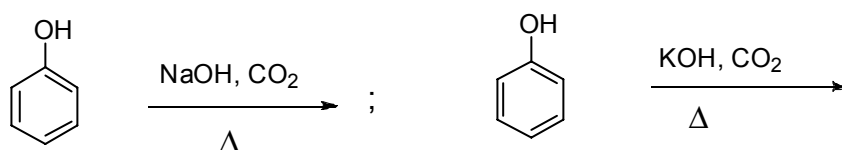
- (b) Complete the reaction sequences and write down the proper structures of **X**, **Y**, **A** and **B**. 4



- (c) Treatment of $\text{Me}_3\text{C-CH=CH}_2$ and $\text{Me}_3\text{C-CH(OH)CH}_3$ with conc. HCl gives the same two isomeric alkyl chloride. Explain. 2

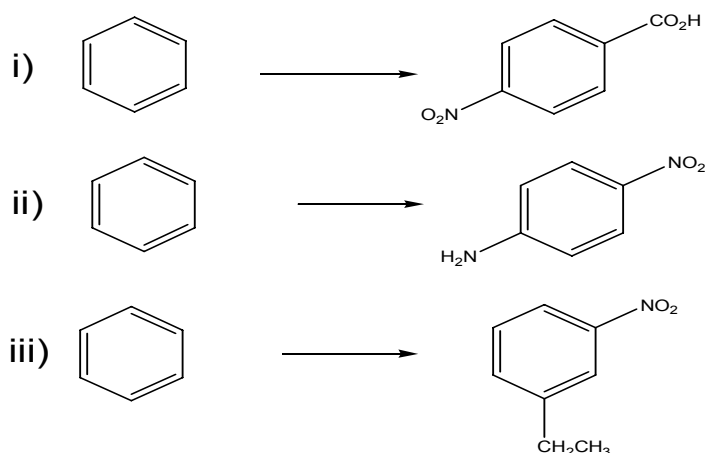
UNIT-II

3. (a) Both phenol and aniline give very poor yield in Friedel-Crafts reaction though OH and NH_2 both are activating groups. 2
- (b) Predict the product(s) of the following reactions with explanation 2



- (c) Both *o*-bromoanisole and *m*-bromoanisole give same product when treated with Na / liq. NH_3 . Give reason for this observation. 2

4. (a) Carry out the following conversions: (any *two*) 2+2



- (b) Chlorobenzene on heating with aq. NH_3 at 200°C in presence of catalyst results in formation of aniline. Whereas the same on reaction with NaNH_2 , NH_3 (l) even at (-33°C) gives the aniline. Explain mechanistically. 2

UNIT-III

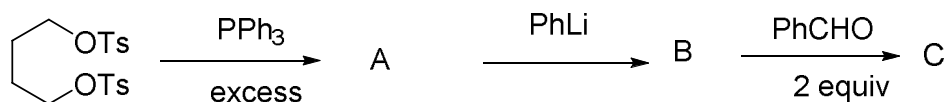
5. (a) It is often necessary to adjust the reaction medium to the right pH in nucleophilic addition to C=O . Explain. 2
- (b) Acetylation with acetylchloride requires dry condition but benzoylation is carried out in aq. alkaline solution. Explain. 2
- (c) Draw the mechanism of Claisen condensation reaction taking the example of ethylacetate. Between Claisen condensation and aldol condensation which one 3

requires larger amount of base? Explain.

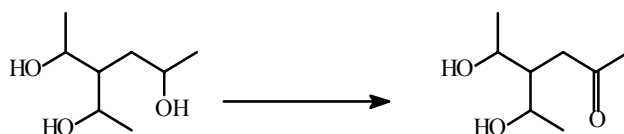
(d) Arrange the following substrates according to their reactivity towards nucleophiles: 2
Me-CO-NMe₂, Me-CO-Cl, Me-CO-SMe, Me-CO-OMe.

(e) Cyclopropanone gives stable hydrate but propanone does not — Why? 2

(f) Identify A, B, and C in the following reaction with mechanism 3

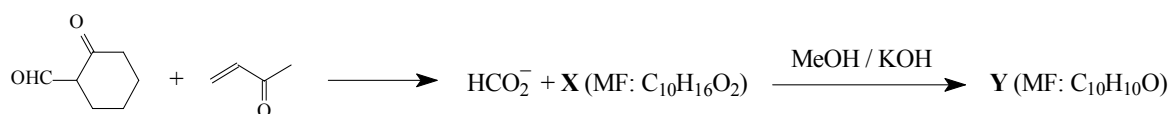


(g) Mention two criteria for a good protecting group. Using protecting / deprotecting group technique outline the following conversion: 2+2



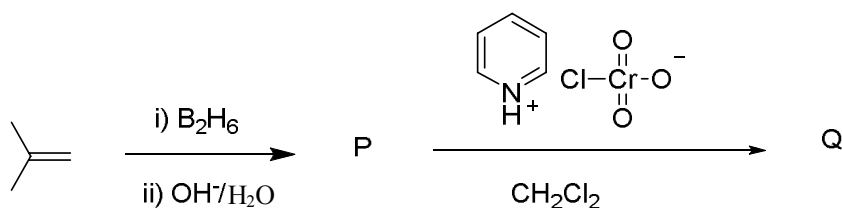
6. (a) Rate of reduction of a ketone by LiAlH₄ decreases when crown ether (12-Crown-4) is added to the reaction mixture — Explain. 2

(b) Identify X and Y in the following reaction sequence and offer mechanistic explanation in support of your answer: 4

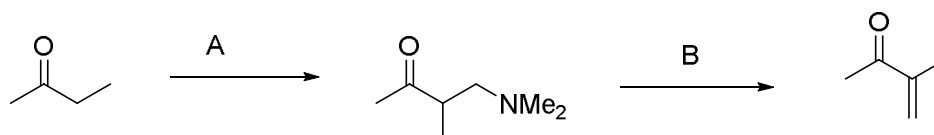


(c) Optically active PhCOCH(Et)Me is racemised on base treatment but PhCOCH₂CH(Et)Me does not — Explain. 2

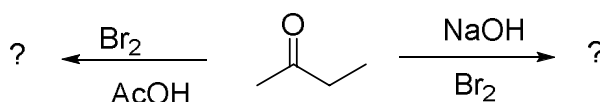
(d) Write down the products P and Q of the following reactions 2



(e) Mention the reagent A and B of the following reaction 2



(f) Predict the products in the following. 2

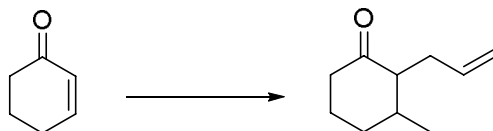


- (g) A solution of $\text{Ph}_3\text{CCO}_2\text{H}$ in cold conc. H_2SO_4 affords MeOCPh_3 when poured in methanol — Explain. 2
- (h) Which of the following compound undergoes decarboxylation reaction more readily? Explain. 2

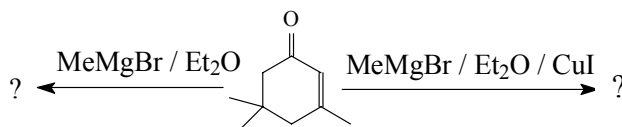


UNIT-IV

7. (a) How would you prepare ethane utilizing Corey house reagent? 2
- (b) Outline the scheme for the following transformation using appropriate organometallic reagent 2



- (c) How could you prepare the acid $\text{R}_3\text{C-CO}_2\text{H}$ from R_3COH ? 2
8. (a) Give the products with proper explanations: 2



- (b) Mention one synthetic application of TMSCN in organic synthesis. 2
- (c) Outline the steps involved for the synthesis of β -phenylethyl alcohol starting from phenyl magnesiumbromide. 2

N.B. : Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.

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