U.G. 3rd Semester Examination - 2021

CHEMISTRY

Course Code: BCEMCCHC303

Course Title: Organic Chemistry

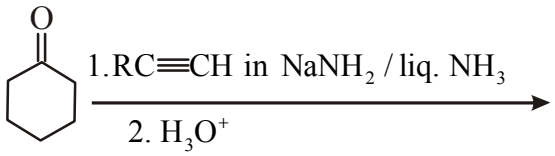
Full Marks : 30 Time : 2 Hours

The figures in the right-hand margin indicate marks.

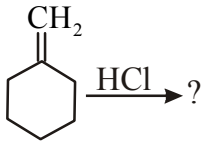
Candidates are required to give their answers in their own words as far as practicable.

1. Answer any **ten** questions: 1×10=10

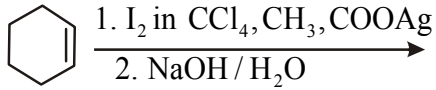
a) Predict the product of the following reaction:



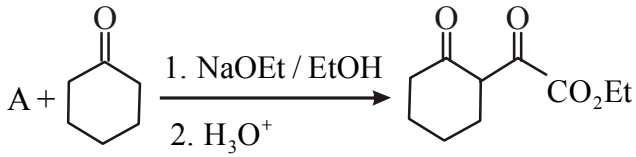
b) Complete the following reaction:



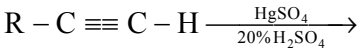
c) Predict the product of the following reaction:



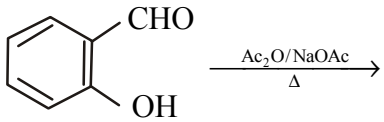
d) What is A in the following reaction?



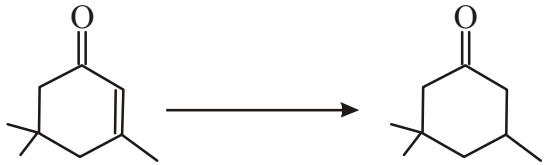
e) Write the product for the following reaction:



f) Predict the product of the following reaction:



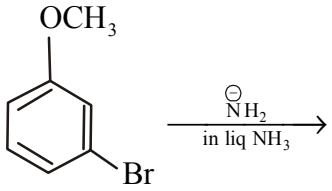
g) Suggest a suitable reagent for the following transformation:



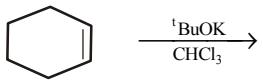
h) What is 'A' and 'B' in the given reaction?

i) Synthesize R_3COH using Grignard reagent and other compound so that all the alkyl groups come from the Grignard reagent.

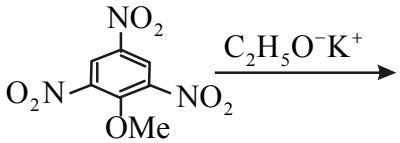
j) Give the product of the following reaction:



k) Write down the structure of the product with proper stereochemistry:

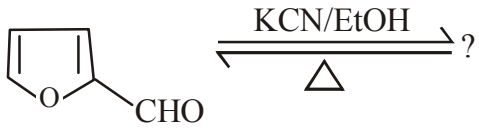


l) Write the product(s) of the following reaction:

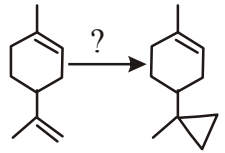


m) Give an example of stable gem-diol compound.

n) What is the expected product in the following reaction?



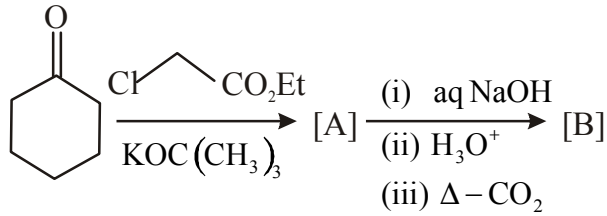
o) Give the missing reagent:



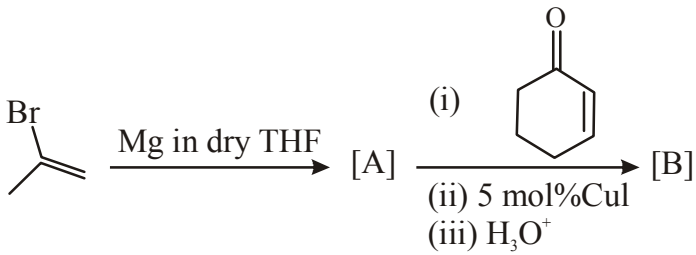
2. Answer any **five** questions from the following: 2×5=10

a) What are the products when a mixture of CH_3CHO and HCHO is treated with $Al(OEt)_3$?

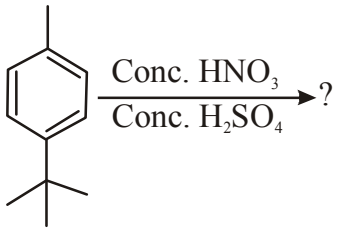
b) Identify A and B in the following reaction:



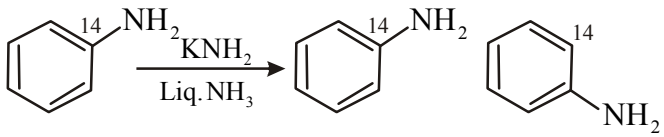
c) Predict the product and discuss the mechanism of the following reaction:



d) Predict the product of the following reaction with plausible meachnism:

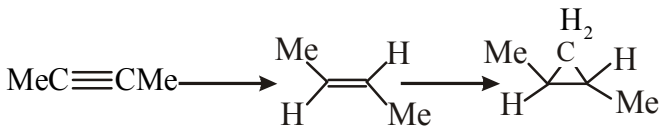


e) Explain the following transformations by proposing suitable mechanism:



f) What are the active electrophiles in Houben-Hoesch and Reimer-Tiemann reaction?

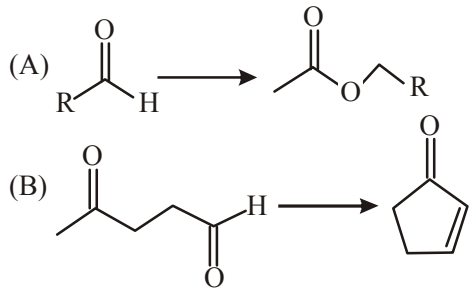
g) Give appropriate reagents to carry out the following transformations. Explain your answer.



h) When a solution of $Ph_3C–COOH$ in conc. H_2SO_4 is poured into methanol, it yields Ph_3COCH_3– explain.

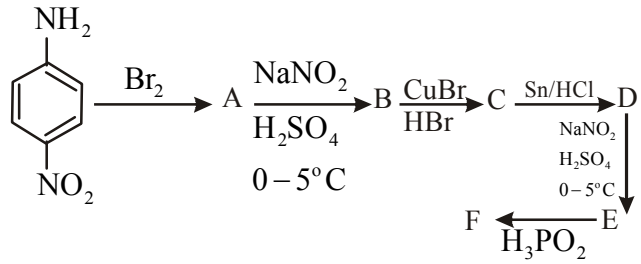
3. Answer any **two** questions from the following: 5×2=10

a) i) Carry out the following conversions with suitable mechanism:



ii) Synthesize propanoic acid from Diethylmalonate. 3+2=5

b) i) Complete the following conversion:



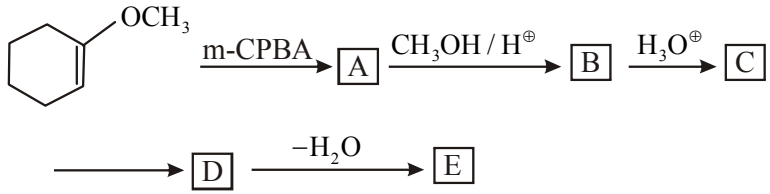
ii) Explain the following observation:

Methyl chlorocetate $(ClCH_2COOCH_3)$

undergoes alkaline hydrolysis (B_{AC}^2) at a much faster rate than methyl acetate $\left(CH_3COOCH_3\right)$. 3+2=5

c) i) Among alkyllithium and alkylmagnesium bromide which one is more reactive reagent and why?

ii) Complete the following reaction sequence (with mechanism) and identify the products: 2+3=5



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