U.G. 3rd Semester Examination - 2020

CHEMISTRY

Course Code: BCEMCCHC303

Course Title: Organic Chemistry III

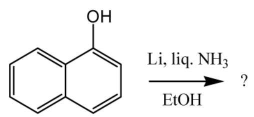
Full Marks : 30 Time : 2 Hours

The figures in the right-hand margin indicate marks.

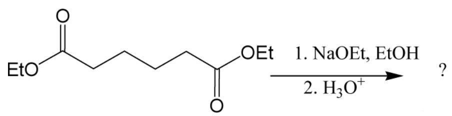
Candidates are required to give their answers in their own words as far as practicable.

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

a) Predict the product of the following reaction



b) Which is the main product of the following reaction?

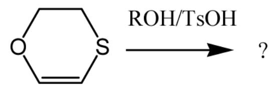


c) Name the compound A in the following reaction

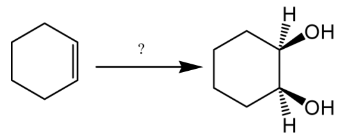
$$C_6H_6 + A \xrightarrow{AlCl_3} C_6H_5\,CH_2CH_2OH$$

d) Give an example of Green Michael condensation reaction.

e) Complete the following reaction



f) Suggest appropriate reagent(s) for the following reaction



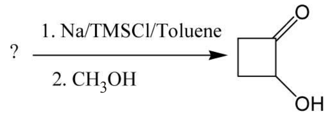
g) An acetoacetic ester synthesis of a ketone proceeds by alkylation of the enolate of the acetoacetic ester followed by ester hydrolysis and decarboxylation of the β-ketoacid. Which of the following methyl ketones is difficult to prepare by this method?

i) $CH_3\underset{\underset{O}{\|}}{C}CH_2CH(CH_3)_2$

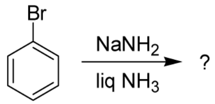
ii) $CH_3\underset{\underset{O}{\|}}{C}CH_2CH_2Ph$

h) Name the starting material and reagents used in Kolbe-Schmidt reaction.

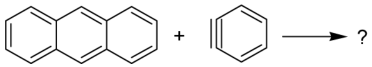
i) Provide missing strating material in the following reaction



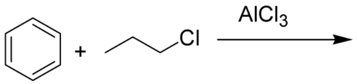
j) Predict the product formation of the following reaction



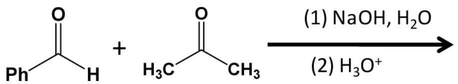
k) Complete the following reaction



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



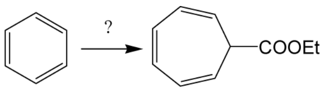
m) Complete the following reaction



n) Predict the product of the following reaction

$$\text{Z-2-Butene} \xrightarrow[\text{2. } H_2O_2/\text{aq. NaOH}]{\text{1. } B_2H_6 \text{ in THF}}$$

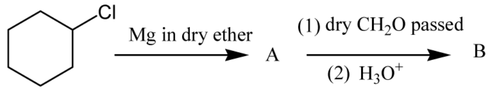
o) Give the missing reagent (along with the reaction condition)



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

a) Methyl phenyl ketone is treated with SeO$_2$ and the product is heated with concentrated alkali. Give the products formed in these reactions.

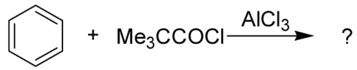
b) Predict the product and discuss the mechanism of the following reaction



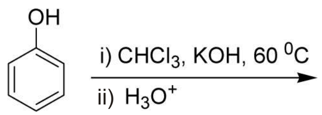
c) Carry out the following conversion

Benzene $\rightarrow$ m-ethylaniline

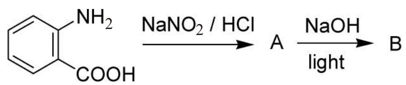
d) Predict the product of the following reaction



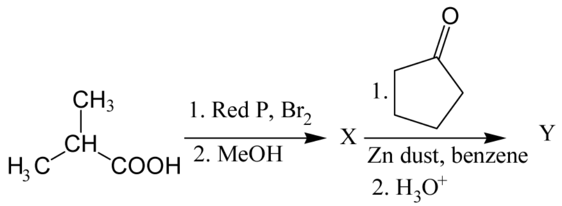
e) Write the product with detail reaction mechanism



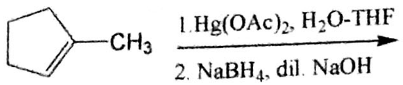
f) Complete the reaction scheme



g) Identify X and Y

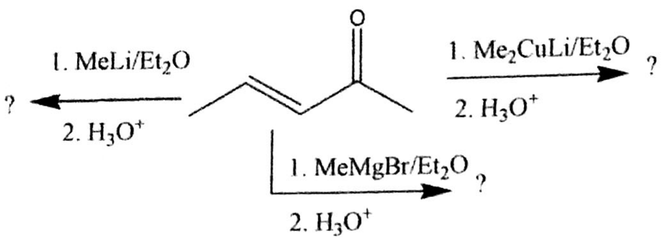


h) Predict the product of the following reaction and provide suitable mechanism



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

a) i) Identify the product/products formed in the following reaction, indicating the major product offer explanation



ii) Carry out the following conversion with suitable mechanism

Oct-l-yne $\rightarrow$ Oct-2-yne.

b) i) How would you convert 3-hexyne to meso-3, 4 dibromohexane? Give the mechanism and stereochemical course for the last step of this conversion. 2

ii) Explain the following observations:

2, 4, 6-Trimethylbenzoic acid (mesitoic acid) does not undergoes esterification under ordinary acid-catalysis conditions (A^2_{AC} mode), whereas in concentrated sulphuric acid it undergoes quantitative esterification. 3

c) i) Discuss briefly about contra-thermodynamic isomerisation of alkene. 2

ii) Sulphonation of naphthalene at 80°C yields mainly α-naphthalenesulphonic acid, whereas at 1 60°C the chief product is β-naphthalenesulphonic acid. Explain these observations. 3