B.Sc. 3rd Semester (Honours) Examination, 2021, (CBCS)

Subject: Chemistry

Course Title: Organic Chemistry-III

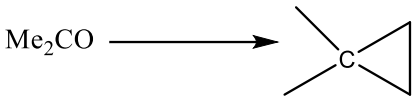
Course Code: CC-7

Time: 2 Hrs. **Full Marks: 40**

Answer any **eight** questions from the following. **5 × 8 = 40**

1. (A) Transform Acetylene to *Cis*- and *Trans*-2-butene.

(B) Carry out the following conversion.

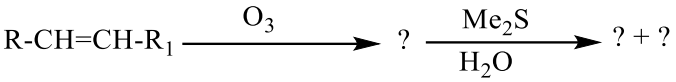


2. (A) What are the precautions to be taken in MPV reduction to shift the equilibrium towards right side? Cite an example where an aldehyde can be converted to an ester by a single reagent.

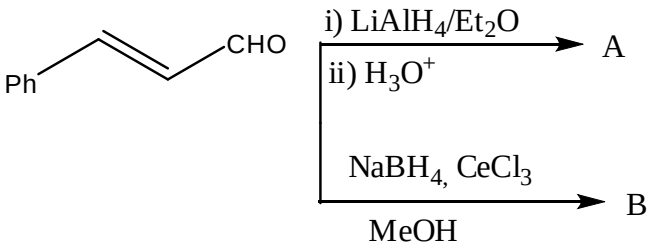
(B) Why acetylene is less reactive than olefins in electrophilic addition?

3. (A) Outline the synthesis of Coumarin from Phenol. Briefly discuss the steps involved.

(B) Identify the products of each step.



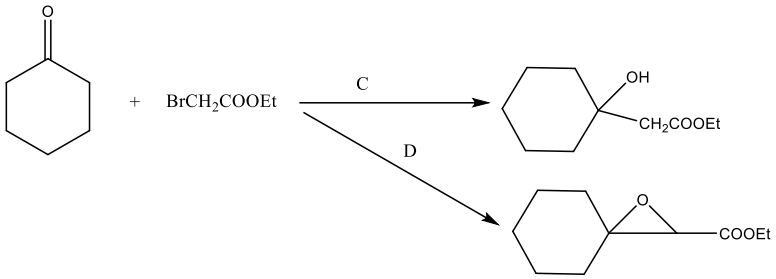
4. (A) Write the structure of the products A and B.



(B) Compare the energy profile diagram for the sulfonation reaction of C_6H_6 and C_6D_6. Indicate the rate limiting step of the reaction.

5. (A) How would you synthesize PhCOCOOH from PhCHO?

(B) Supply the missing reagents C and D and the names of the reactions involved.

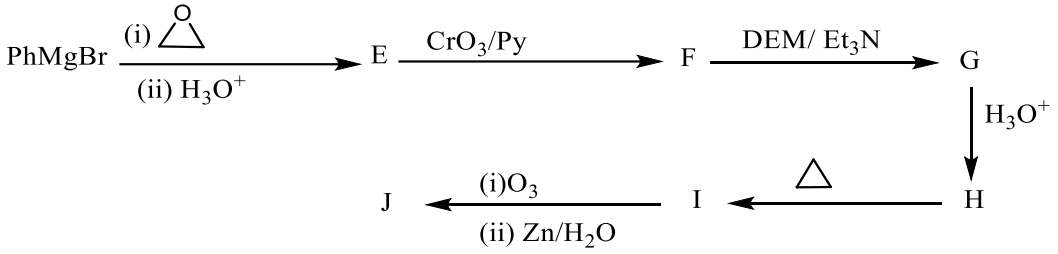


6. Explain why

(A) Acetals are quite stable to hydrolysis by base.

(B) *Para*-nitrobenzaldehyde and *para*-dimethylamino benzaldehyde do not undergo Benzoin Condensation.

7. Identify E to J.

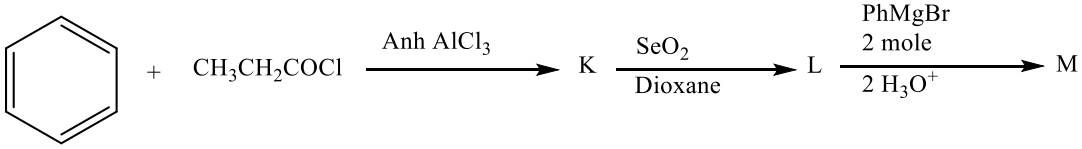


8. (A) Give the mechanism of desulfonation of benzenesulfonic acid. It is an example of what type of reaction?

(B) Acetals and ketals regenerate the corresponding carbonyls upon treatment with an aq. acid but 1,3-Dithianes are stable in acid. Explain.

9. (A) 2,4,6-trimethylbenzoic acid does not undergo esterification under ordinary acid catalyzed condition A_{AC}^2 mode, whereas in conc. Sulphuric acid, it undergoes quantitative esterification.

(B) Identify K to M in the following reaction sequence.



10. A) Butanone on bromination in presence of NaOH produces $CH_3CH_2COCBr_3$ whereas in the case of brominationin acetic acid medium the major product is $CH_3CHBrCOCH_3$. Explain the observation with mechanistic details.

B) Explain what happens when *p*-hydroxy benzoic acid is treated with bromine water?