

**B.Sc. 3<sup>rd</sup> Semester (Honours) Examination, 2020 (CBCS)**

**Subject: Chemistry**

**Paper: CC-7**

**(Organic Chemistry-III)**

**Time: 2 Hours**

**Full Marks: 40**

*Candidates are required to give their answers in their own words*

Answer **any eight** questions from the following:

**5 × 8 = 40**

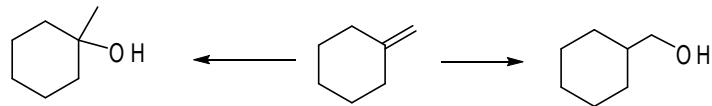
(1) Nitrobenzene is used as a good solvent for Friedel-Craft reaction – why?

Predict the product (A) of the following reaction with plausible mechanism.



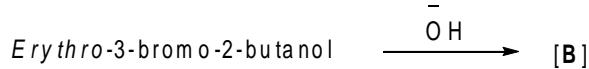
(2) Benzoin Condensation is an example of Umpolung reactivity- explain. Explain why Benzoin condensation fails when electron donating and electron withdrawing groups are present at *ortho*- or *para*- position with respect to aldehyde.

(3) Carry out the following conversions:



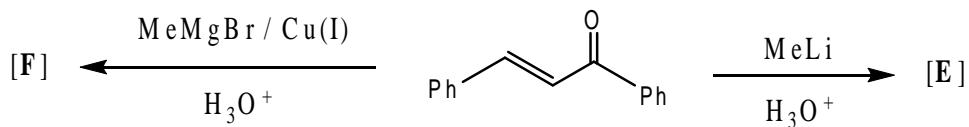
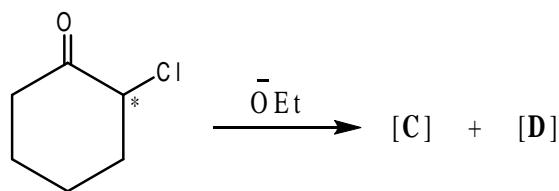
Name a reagent other than cyanide ion which can be used as catalyst in Benzoin condensation.

(4) Identify the product [B] and comment on the optical activity of it.

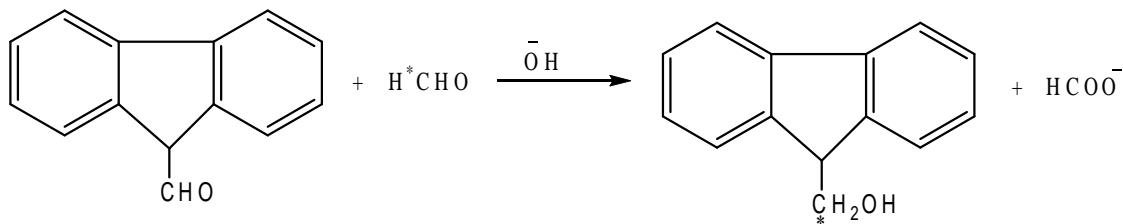


Convert: PhCHO → PhCDO and C<sub>6</sub>H<sub>6</sub> → C<sub>6</sub>H<sub>5</sub>D

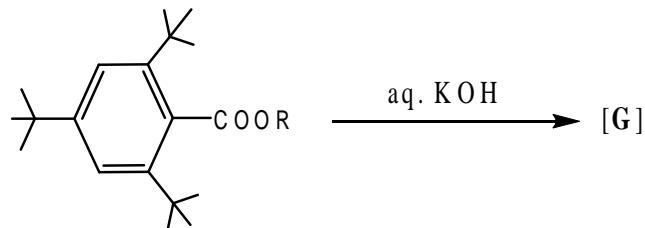
(5) Identify the products [C] to [F] in the following reactions with plausible mechanism.



(6) Explain why  $\text{Me}_2\text{CHCOOEt}$  fails to undergo Claisen condensation in presence of  $\text{NaOEt}$ . Explain the following reaction with mechanism.

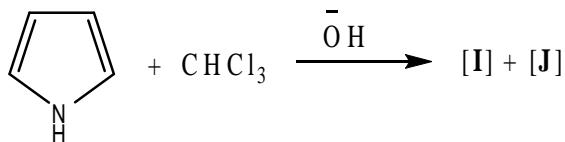
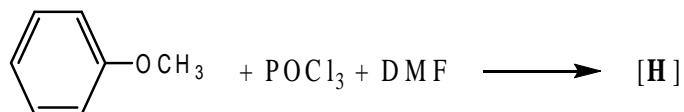


(7) Organomagnesium compounds are not used in Reformatsky reaction – explain why. Predict the product  $[\text{G}]$  with proper mechanism and explanation. How can you symbolically represent the mechanism?

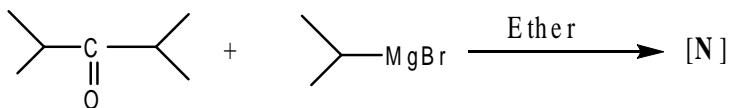
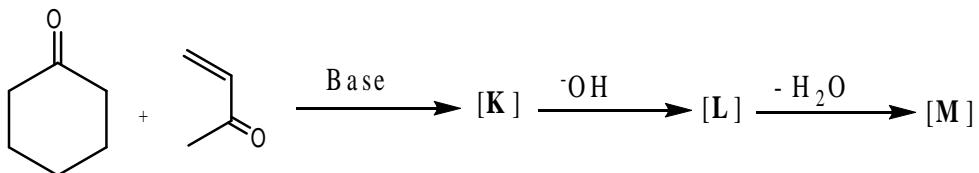


(8) Give an example of aromatic sulfonation reaction where both kinetically controlled and thermodynamically controlled products can be formed under different conditions. Explain with energy profile diagram.

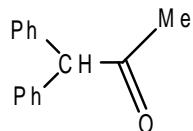
Identify the products  $[\text{H}]$  to  $[\text{J}]$  in the following reactions.



(9) Identify the products [K] to [N] with plausible mechanism in the following reaction sequences.



How can you prepare the following compound by Darzenes Glycidic ester condensation?



(10) What do you mean by stabilized ylides and unstabilized ylides? Explain the difference in stereoselectivity when they are treated with an aldehyde. Explain the formation of the product [O] with stereochemistry.

