

Name of the Student: \_\_\_\_\_

Max. Marks : 10 Marks

Time : 10 Minutes

Q1.

The mechanism for the reaction of methane with fluorine is a free-radical substitution similar to the chlorination of methane.

- (a) Outline the following steps in the mechanism for the reaction of methane with fluorine to form fluoromethane,  $\text{CH}_3\text{F}$

*Initiation step*

\_\_\_\_\_

*First propagation step*

\_\_\_\_\_

*Second propagation step*

\_\_\_\_\_

*A termination step*

\_\_\_\_\_

(4)

- (b) Write an overall equation for the reaction of fluorine with fluoromethane to form tetrafluoromethane.

\_\_\_\_\_

(1)

(Total 5 marks)

Q2.

Chlorination of ethane follows a free-radical substitution mechanism. This mechanism is similar to that which occurs when methane is chlorinated. The overall equation for the reaction of ethane to form chloroethane is given below.



State the conditions and outline a mechanism for this reaction. Show how butane can be formed in this reaction.

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(Total 5 marks)