

**Question 22** (6 marks)

A student prepared the compound methyl propanoate in a school laboratory.

- (a) Give a common use for the class of compounds to which methyl propanoate belongs. 1

..... Esters..... such..... as..... methyl propanoate.....  
..... are..... used..... in..... perfumes.....

- (b) In the preparation of this compound a few drops of concentrated sulfuric acid were added to the starting materials. The mixture was then refluxed for a period of time. 2

Why was it necessary to reflux the mixture?

..... Reflux occurred because of the.....  
..... use of volatile reagents in esterification.....  
..... As the reagent <sup>become</sup> vapour readily, refluxing.....  
..... force ~~it~~ the vapour back into the reaction.....  
..... mixture to allow heating to continue for a long time.....

- (c) Name the TWO reactants used in preparing the methyl propanoate and draw their structural formulae. 3

..... propanoic acid.....

