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MATRIC NO: 19/MHS01/407

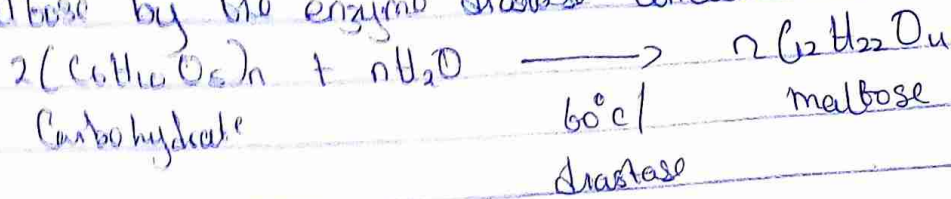
### Chem 102 Assignment

- 1a) Based on the number of hydrogen atoms attached to the carbon atoms containing the hydroxyl group. If the number of hydrogen atoms attached to the carbon atom bearing the hydroxyl group are three or two, it is called primary alcohol. If it's one it is called secondary alcohol and if no hydrogen atom is attached to the carbon atom, it is called tertiary alcohol. Examples methanol, propan-2-ol and methyl propan-2-ol.
- b) Based on the number of hydroxyl group they possess. Monohydric alcohols possess one hydroxyl group while trihydric alcohols or triols have three hydroxyl groups present in the structure of the alcohol. Examples are propanol, Ethane-1,2-diol, propan-1,2,3-triol.

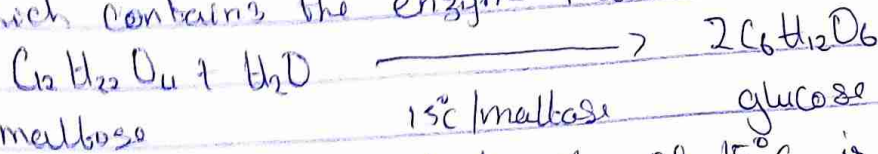
2) Lower alcohols with up to three carbon atoms in their molecules are soluble in water because these lower alcohols can form hydrogen bond with water molecules. The water solubility of alcohols decreases with increasing relative molecular mass. All monohydric alcohols are soluble in organic solvents. The solubility of simple alcohols and polyhydric alcohols is largely due to their ability to form hydrogen bonds with water molecules.

3) Carbohydrates such as starch are major group of natural compounds that can be made to yield ethanol by the biological process of fermentation. The biological catalysts, enzymes found in yeast break down the carbohydrate molecules into ethanol to give a yield of 95%. The starch containing materials include molasses, potatoes, cereals, rice and on warming with malt to  $60^{\circ}\text{C}$  for a specific period of time are converted into

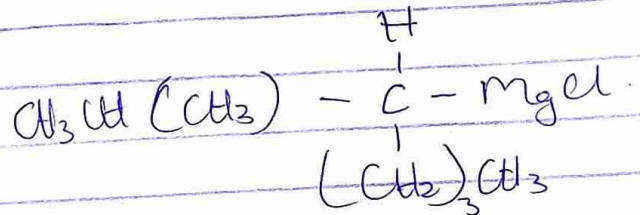
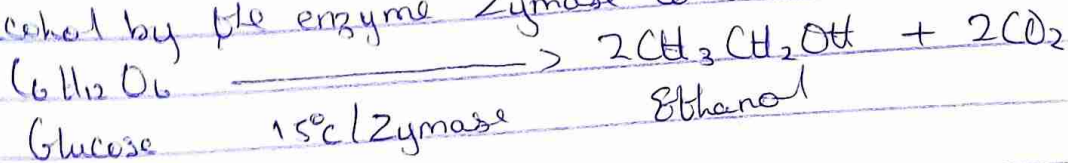
maltose by the enzyme diastase contained in the malt.



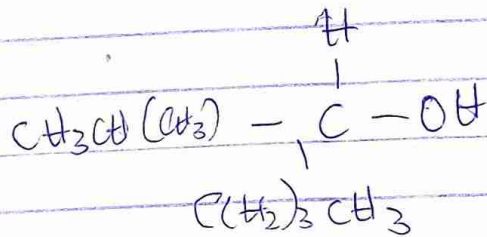
The maltose is broken down into glucose on addition of yeast which contains the enzyme maltase and at a temp. of  $15^\circ C$ .



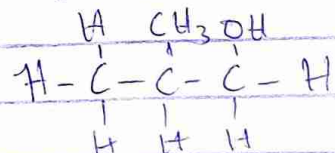
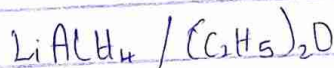
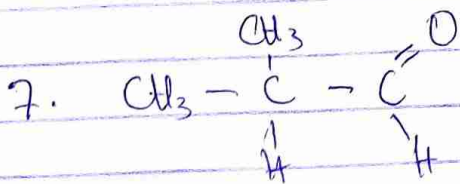
The glucose at constant temp. of  $15^\circ C$  is then converted into alcohol by the enzyme Zymase contained also in yeast.



hydrolysis  $\downarrow H^+$



(2-methyl heptan-3-ol)



2-methyl propanol





Dehydrate propanol by using conc.  $\text{H}_2\text{SO}_4$ .

