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**COLLEGE/DEPARTMENT- MEDICAL LABORATORY SCIENCE**

**MATRIC NUMBER- 19/MHS06/014**

**COURSE CODE- CHM 102**

**QUESTION 1**

1. Primary Alkanols- It is an alcohol which has the hydroxyl group connected to a primary carbon atom. It is a molecule containing a “-CH2OH” group. Examples
2. Butanol- CH3CH2CH2CH2OH
3. Ethanol- CH3CH2OH
4. Secondary Alkanols- It is the one in which the hydroxyl group [-OH] is attached to a carbon with only one hydrogen atom attached. It will have two R groups attached to the carbon-hydroxyl group. It has a formula “-CHROH”. Examples
5. Butan-2-ol- CH3CH2CHOHCH3
6. Propan-2-ol- CH3CHOHCH3

**QUESTION 2**

In the first stage, the Grignard reagent adds across the carbon-oxygen double bond.

CH3CH2MgBr + CH3CH2CH2CH2C=OCH2CH2CH3 → CH3CH2CH2CH3

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CH3CH2 ‒ C – O ‒MgBr

ǀ

CH2CH2CH3

Dilute acid is then added to this to hydrolyze it.

CH3CH2CH2CH3

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CH3CH2 – C – O – MgBr + H2O → CH3CH2CH2CH2CH3 + Mg [OH] Br

ǀ H3O⁺ ǀ

CH2CH2CH3 CH3CH2 – C– OH

ǀ

CH2CH2CH3

**QUESTION 3**

From starchy foodstuff- Like rice, maize rare the main source of ethanol. The starch granules are first extracted by crushing and pressure cooking the material. They are then extracted with malt at 50 to 60 °C for an hour, the malt contains the enzyme, diatase and the starch is converted by this enzyme into maltose.

2[C6H10O5] n(s) + nH2O (l)  → n C12H22O11 (aq)

Starch water diatase maltose

60°C

Yeast is then added at room temperature which contains two enzymes; maltase which converts the maltose to glucose and zymase which then decomposes the glucose into ethanol and carbon [IV] oxide.

C12H22O11 (aq) + H2O (l) → 2C6H12O6 (aq)

Maltose water maltase glucose

15°C

C6H12O6 (aq) → 2C2H5OH (aq) + 2CO2

Glucose zymase ethanol carbon [IV] oxide

15°C

**QUESTION 4**

Reducing agents like lithium tetrahydridoaluminate [III] - (LiAlH4) and lithium tetrahydridoborate [III] – (LiBH4) dissolves in ethoxyethane while sodium tetrahydridoborate [III] – (NaBH4) dissolves in water or methanol.

CH3CHO → CH3CH2OH

Ethanal reduction ethanol

LiAlH4/ [C2H5]2O

The LiAlH4 reduces ethanal to ethanol.

[CH3]2CO → [CH3]2CHOH

Propanone reduction Propan-2-ol

NaBH4/ [C2H5]2O

NaBH4 reduces propanone to propan-2-ol.