1. Haloalkane A is treated with sodium hydroxide
   (a) Predict the 2 possible products arising from OH- carrying out a substitution or elimination
   mechanism, draw the structures and name them. (4 marks)

2. State the role of OH- in the mechanisms leading to these products (2 marks)

3. How do the reaction conditions change in order to select one product over the other one? (2 marks)

4. If you wanted to regenerate A from the elimination product, what reagent would you use and what
   mechanism would it proceed by? (2 marks)
5.3.2

1. (a) Substitution
   - butan-1-ol

\[
\begin{array}{c}
\text{H} \\
\text{H} \\
\text{C} \text{=C} \\
\text{H} \\
\text{H} \\
\text{OH} \\
\end{array}
\quad \text{H} \quad \text{C} \quad \text{H} \quad \text{H} \quad \text{Br} \\
\quad \text{H} \quad \text{H} \quad \text{H} \\
\quad \text{H} \quad \text{H} \\
\quad \text{H} \\
\end{array}
\]

Elimination
- the OH acts as a base

\[
\begin{array}{c}
\text{H} \\
\text{H} \\
\text{C} \text{=C} \\
\text{H} \\
\text{H} \\
\text{H} \quad : \text{OH} \\
\end{array}
\quad \text{CH}_3\text{CH}_2 \quad \text{H} \\
\quad \text{C} \quad \text{=C} \\
\quad \text{H} \quad \text{H} \\
\end{array}
\]

2. Substitution – the OH- acts as a nucleophile
   Elimination – the OH- acts as a base

3. Substitution – aqueous NaOH
   Elimination – ethanolic NaOH

4. H-Br, electrophilic addition

5.3.3

1. C + E
2. A + B
3. A, B, D, E, F, G

5.3.4

1. Glucose
   - (1 mark)

\[
\begin{array}{c}
\text{H} \\
\text{H} \\
\text{C} \text{=C} \\
\text{H} \\
\downarrow \text{H}_2\text{O, heat} \\
\end{array}
\quad \text{H}_2\text{SO}_4 \\
\quad \text{Ethanol} \\
\quad \text{CH}_3\text{CHO} \\
\quad \text{K}_2\text{Cr}_2\text{O}_7 \\
\quad \text{CH}_3\text{COOH} \\
\end{array}
\]

\[
\begin{array}{c}
\text{B} \\
\text{Yeast} \\
\end{array}
\]