Question 30 (8 marks)

(a) Compare the process of polymerisation of ethylene and glucose. Include relevant chemical equations in your answer. **3**

$n\ C_2H_4 \rightarrow -[C_2H_4]_n-$

$n\ C_6H_{12}O_6 \rightarrow -[C_6H_{10}O_5]- + n\ H_2O$

polymerisation of ethylene is not a condensation polymerisation like the polymerisation of glucose, shown by the water produced.

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Question 30 (continued)

(b) Explain the relationship between the structures and properties of THREE different polymers from ethylene and glucose, and their uses. **5**

LDPE has a lot of chain branching and therefore a lower density as the molecules cannot be packed close together, this is used for CD cases and other packaging
HDPE has very little chain branching and thus has a high density as the molecules can pack close together. This is used for strong childrens toys
Cellulose is a long chain of alternating glucose molecules and is a plants main way of storing energy and can be used to create fabrics.

End of Question 30