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**Question 30** (8 marks)

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

Ethylene - the initialisation where the breaking of the ~~the~~ double bond providing it with free radical sites on either ends  $\cdot(\text{C}-\text{C})\cdot$ . then addition where other hydrocarbon chains with radical sites are joined up and then the end termination where it terminates the radical ends. Glucose are polymerised similar but due to its bulky structure ~~the~~ they join by having  $\text{H}_2\text{O}$  as a by product.

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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: ~~ethylene~~ Structure: ~~High pressure~~ <sup>so</sup> side branching

Properties: ~~strong~~ fragile, flexible

<sup>PVC</sup>  
HDPE: Structure: ~~strong~~ linear, no side branches

Properties: strong, hard.

P.H.B. Structure: linear.

Properties: strong.

They are all made from ethylene and glucose, relation is that it can come from crude oil which is non renewable resource or cellulose which is made from renewable resource.

End of Question 30