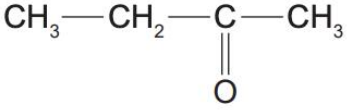
Question 33 **(12 marks)**

Organic molecules have a hydrocarbon skeleton and can contain functional groups that are responsible for the molecules' characteristic chemical properties.

Complete the following tables by

(i) writing the structural formula of each compound listed
(ii) writing the structural formula of the organic product from the reaction
(iii) naming the organic product from the reaction.

When writing the structural formula, show the bonds between carbon atoms and within any functional group e.g. 

Name of compound		Structural formula of compound
pent-2-ene		
Reacts with $Br_2(aq)$	**Structural formula of organic product**	
	Name of organic product	

<table>
<tr><th colspan="2">Name of compound</th><th>Structural formula of compound</th></tr>
<tr><td colspan="2">ethanal</td><td></td></tr>
<tr><td rowspan="2">Reacts with $KMnO_4(aq)$ / $H^+(aq)$</td><td>Structural formula of organic product</td><td></td></tr>
<tr><td>Name of organic product</td><td></td></tr>
</table>

Name of compound		Structural formula of compound
butanoic acid		
Reacts with $Na_2CO_3(aq)$	**Structural formula of organic product**	
	Name of organic product	