Question 34 (Answer: **C**)

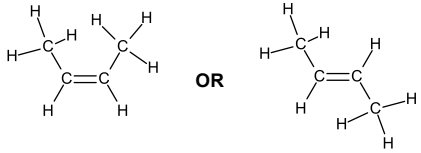
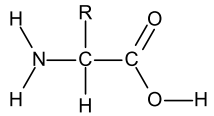
- Structural isomers must have the *same* molecular formula but a different arrangement of atoms.
- So count the carbons and hydrogens in each structure before comparing anything.
- Only structures with identical formulae can be isomers; the difference between them is the branching.

Question 37 (Answer: **C**)

- Members of a homologous series share the same functional group and the same general formula.
- So identify the functional group in each structure before comparing them.
- Two alkanes belong together; an alkene or an alcohol belongs to a different series.

5(a)	**M1** (have a) general formula of C_nH_{2n+2} **M2** differ from one member to the next by a $–CH_2–$ unit
5(b)(i)	increases
5(b)(ii)	**M1** physical property **M2** change as chain length increases
5(c)	all carbon–carbon bonds are single (bonds)
5(d)(i)	ultraviolet light
5(d)(ii)	**M1** $CH_3CH_2CH_2Cl$ **M3** 1-chloropropane **M2** $CH_3CHClCH_3$ **M4** 2-chloropropane
5(d)(iii)	(compounds with) the same molecular formula but different structural formulae or structure

6(a)	correctly circled ester link (including 2 C atoms and 2 O atoms)
6(b)	ethyl butanoate
6(c)	C_3H_6O
6(d)(i)	**M1** butanoic acid **M2** ethanol
6(d)(ii)	acid
6(e)	4
6(f)	$2C_5H_{10}O_2 + 13O_2 \rightarrow 10CO_2 + 10H_2O$

6(a)	**M1** C 50(.00) ÷ 12 H 5.56 ÷ 1 O 44.44 ÷ 16 OR 4.17:5.56:2.78 **M2** fractions shown dividing all by smallest OR 1.5:2:1 OR 3:4:2 **M3** $C_3H_4O_2$
6(b)	$C_4H_4O_4$
6(c)(i)	water
6(c)(ii)	acid
6(c)(iii)	**M1** propanoic acid **M2** butan-1-ol
6(d)(i)	addition
6(d)(ii)	polymers are of indefinite length
6(d)(iii)	3 / three
6(d)(iv)	**M1** C = C **M2** displayed formula of but-2-ene 
6(e)(i)	 **M1** $–NH_2$ displayed **M2** –COOH displayed functional groups can be on either side
6(e)(ii)	one circle around either amide linkage
6(e)(iii)	proteins

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Question 33 (Answer: **B**)

- Methyl ethanoate is $C_3H_6O_2$, and a structural isomer must have exactly that formula.
- Ethyl methanoate and propanoic acid are both $C_3H_6O_2$, so both qualify.
- Propane-1,3-diol is $C_3H_8O_2$ – two hydrogens too many, so it is not an isomer.

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Question 34 (Answer: **A**)

- Members of a homologous series share the same functional group and the same general formula.
- Their physical properties change gradually along the series as the chain lengthens.
- So their physical properties are *not* the same – only the trend is shared.

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6(a)	**M1** (have a) general formula of C_nH_{2n} **M2** (have a) C=C functional group
6(b)	compounds made of C and H only
6(c)	$2C_3H_6 + 9O_2 \rightarrow 6CO_2 + 6H_2O$ **M1** $CO_2 + H_2O$ as only products **M2** correct equation
6(d)	CH_2
6(e)	but-2-ene
6(f)	displayed formula of but-1-ene
6(g)(i)	only one product is formed
6(g)(ii)	orange to colourless
6(g)(iii)	2,3-dibromobutane
6(h)(i)	displayed formula of ethanoic acid
6(h)(ii)	ethanoic acid
6(h)(iii)	$CH_3CH=CHCH_3 + 2O_2 \rightarrow 2CH_3COOH$