

Answers to examination-style questions

Answers	Marks	Examiner's tips
<p>1 (a) (i) <i>any two from:</i></p> <ul style="list-style-type: none"> • show a gradual change in physical properties or a gradual change in, for example, melting point • differ by CH₂ • react in similar way • have the same functional group <p>(b) (i) the molecular formula gives the actual number of atoms of each element in a molecule</p> <p>(ii) C₁₄H₃₀ only</p>	<p>2</p> <p>1</p> <p>1</p>	<p>Don't say they have the same molecular formula or empirical formula. Their formulae go up by CH₂ each time.</p> <p>Learn this definition. Do not confuse with amount of atoms or ratio of atoms.</p> <p>The general formula is C_nH_{2n+2}</p>
<p>2 (a) (i) molecule or compound which consists of hydrogen and carbon only</p> <p>(ii) C_nH_{2n+2}</p> <p>(iii) C₆H₁₄</p> <p>(b) <i>any two from:</i></p> <ul style="list-style-type: none"> • chemically similar / react in same way • differ by CH₂ • same functional group • gradation in physical properties or specified trend, e.g. b.p. <p>(c) (i) same molecular formula and different structural formula</p> <p>(ii) 2-methylpentane 2,2-dimethylbutane</p> <p>(iii)</p> <p>Isomer 3 either order Isomer 4</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> $\begin{array}{c} \text{CH}_3 \\ \\ \text{CH}_3\text{CH}_2-\text{CH}-\text{CH}_2\text{CH}_3 \end{array}$ </div> <div style="text-align: center;"> $\begin{array}{c} \text{CH}_3 \\ \\ \text{CH}_3-\text{CH}-\text{CH}-\text{CH}_3 \\ \\ \text{CH}_3 \end{array}$ </div> </div> <p>(d) (i) % by mass of H = 7.70% mol H = 7.70 / 1 = 7.70 mol C = 92.3 / 12 = 7.69 ratio 1 : 1 → CH</p> <p>(ii) CH has empirical mass of 13 and $\frac{78}{13} = 6 \rightarrow \text{C}_6\text{H}_6$</p>	<p>1</p> <p>1</p> <p>1</p> <p>2</p> <p>1</p> <p>1</p> <p>1</p> <p>2</p> <p>1</p> <p>1</p> <p>1</p>	<p>Don't get confused with M_r</p> <p>Always draw stick pictures when structures are asked for.</p>
<p>3 (a) dichlorodifluoromethane</p> <p>(b) tetrachloromethane</p> <p>(c) 1,1,2,2-tetrachloroethane</p>	<p>1</p> <p>1</p> <p>1</p>	

Answers to examination-style questions

Answers	Marks	Examiner's tips
4 (a) <i>any two from:</i> <ul style="list-style-type: none">• appropriate structure for pent-2-ene• appropriate structure for 2-methylbut-2-ene• appropriate structure for 3-methylbut-1-ene (b) Y = 2-bromo-2-methylbutane	2 1	Draw 'stick' pictures showing all the bonds. Remember to number the longest chain and then give the substituents the lowest numbers.
5 (a) (i) $\begin{array}{c} \text{CH}_3 \\ \\ \text{CH}_3 - \text{CH} \\ \\ \text{CH}_3 \end{array}$ $\text{CH}_3\text{CH}_2\text{CH}(\text{Br})\text{CH}_3$	1 1	
(ii) 2-bromo-2-methylpropane	1	The groups added on are put in alphabetical order so bromo comes before methyl.