

Mark Scheme - 1

1.

Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
(a)	1	horse C			
(b)	1	no, none have a spot corresponding to caffeine	no samples match caffeine		
(c)	2	<p>3 (1) R_f value = 0.3 (1)</p> <p>correct answer only (cao) – 2 marks</p> <p>ft incorrect 'distance moved' only if value given divided by 10 i.e. correct distance moved by solvent – 1 mark</p>			

2.

Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
(a)	1	purple and yellow both needed			
(b)	2	<p>0.4×10 (1)</p> <p>4 (1)</p> <p>award (2) for correct answer only (cao)</p> <p>no error carried forward (ecf)</p>			
(c)	1	(food colourings are) soluble (in water) / (food colouring) dissolve (in water)			

3.

Mark	Answer
6	<p>Indicative content: how it is carried out – spot of each ink on pencil line and dip end of paper in water, leave for water to rise up paper what happens – water dissolves ink and carries the components different distances according to their solubilities, appear as spots/streaks on paper / as chromatogram results – if inks contain the same pigments, the pattern of spots would be identical; different pattern if inks contain different pigments</p> <p>5-6 marks: The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.</p> <p>3-4 marks: The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.</p> <p>1-2 marks: The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.</p> <p>0 marks: The candidate does not make any attempt or give a relevant answer worthy of credit.</p>

4.

Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
(a)			1	a compound containing hydrogen and carbon only			mixture
(b)			1	each fraction collected across a range of temperatures / several compounds have similar boiling points		melting points	
(c)	(i)		1	(catalytic) cracking			
	(ii)		1	polymerisation			
(d)			2	double bond breaks / turns in to single bond (1) molecules join together to form (long) chains (1)			
(e)			1	non-biodegradable / increased use of landfill / depletion of raw materials produce toxic / harmful gases when burned	can harm wildlife	'harmful' – unless linked to burning	

5.

Mark	Answer
6	<p>Indicative content appropriate apparatus required, measured amount of alkali (or acid) in conical flask, add indicator <i>e.g. phenolphthalein</i>, add acid (alkali), drop-wise near end point/colour change, record volume of acid (alkali) added, repeat without indicator adding recorded volume of acid (alkali), boil off some of the water, leave solution to evaporate, dry crystals obtained</p> <p><i>Credit awarded for sequenced labelled diagrams as part of the response.</i></p> <p>5-6 marks The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.</p> <p>3-4 marks The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.</p> <p>1-2 marks The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.</p> <p>0 marks The candidate does not make any attempt or give a relevant answer worthy of credit.</p>

6.

Mark	Guidance
6	<p>Indicative content: This method of separation is called fractional distillation. Crude oil is a mixture of hydrocarbons. The crude oil is heated and vaporised before entering the column. Smaller/lower boiling hydrocarbons will rise in the column and condense higher up the column. Hydrocarbons with similar boiling points condense at the same level in the column. (Boiling point depends on the size of the molecule – larger molecules have higher boiling points.)</p> <p>5-6 marks: The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.</p> <p>3-4 marks: The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.</p> <p>1-2 marks: The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.</p> <p>0 marks: The candidate does not make any attempt or give a relevant answer worthy of credit.</p>

7.

Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
(a)	(i)		1	condenser			
	(ii)		1	chromatography			
(b)			1	C	distillation		

8.

Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
(a)	(i)		1	lakes / rivers / streams / aquifers / groundwater		surface water / rain / wells / springs	seawater sewers
	(ii)		1	1	sedimentation		
	(iii)		1	chlorination			
(b)			1	stop washing cars/ windows stop watering gardens/ using a hose pipe don't run water when washing teeth/ low flush toilets/ dual flush toilets/ only run washing machine once a week/ only run washing machine with a full load/ shower instead of bath use waste water to flush toilets / clean car		don't wash don't use water collect rainwater use bottled water	

9.

Mark	
6	<p>Indicative content: a description of the reaction between the carbonate and the acid – apparatus named, effervescence, exothermic, the formation of blue coloured copper sulfate solution and the addition of excess of the copper carbonate. The removal of the excess copper carbonate by filtration. Obtaining the crystals by evaporation. Either allowing the solution to evaporate at room temperature or by heating the solution and allowing the remaining solution to evaporate naturally to dryness. Credit to be given for word/symbol equation.</p> <p>5 – 6 marks: The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.</p> <p>3 – 4 marks: The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.</p> <p>1 – 2 marks: The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.</p> <p>0 marks: The candidate does not make any attempt or give a relevant answer worthy of credit.</p>