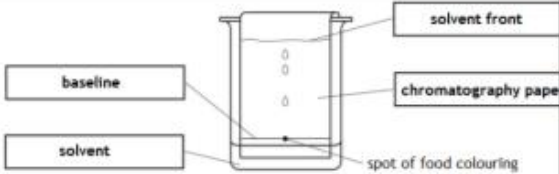


**Chromatography Past Paper Answers IGCSE Edexcel**

1.

Question number	Answer	Notes	Marks
1 (a)		<p>Four correct scores 3</p> <p>Two correct scores 2</p> <p>One correct scores 1</p>	3
(b) (i)	<p><b>C</b> (R)</p> <p>The only correct answer is C because food colouring R produces one spot so contains only one dye</p> <p><i>A is not correct because food colouring P produces four spots so does not contain only one dye</i></p> <p><i>B is not correct because food colouring Q produces three spots so does not contain only one dye</i></p> <p><i>D is not correct because food colouring S produces two spots so does not contain only one dye</i></p>		1
(ii)	<p><b>C</b> (Q, R and S)</p> <p>The only correct answer is C because food colourings Q, R and S have one dye in common as they all produce one spot which has travelled the same distance</p> <p><i>A is not correct because P, Q and R do not all produce one spot which has travelled the same distance</i></p> <p><i>B is not correct because P, R and S do not all produce one spot which has travelled the same distance</i></p> <p><i>D is not correct because P, Q, R and S do not all produce one spot which has travelled the same distance</i></p>		1

Question number	Answer	Notes	Marks
1 (b) (iii)	<p><b>M1</b> P</p> <p><b>M2</b> largest number of/four spots (in the chromatogram)</p>	<p><b>ALLOW</b> "four dyes"</p> <p><b>ALLOW</b> blobs / dots / marks / points for spots</p> <p><b>M2</b> DEP on <b>M1</b></p>	2

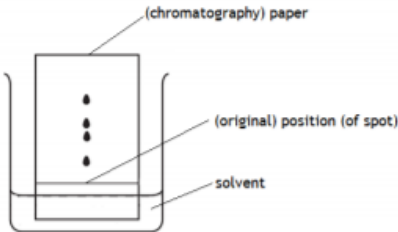
**Total for Question 1 = 7 marks**

2.

Question number	Answer	Notes	M
(a)	pencil/it won't dissolve (in water/solvent)	<p>ACCEPT ink/pen would/might dissolve (in water/solvent)</p> <p>ALLOW pencil won't separate (in the water)</p> <p>ALLOW ink would mix with the food colourings/water</p> <p>ALLOW ink would smudge/run/separate (in the water)/interfere with the results</p>	
(b) (i)	<p><b>D</b> contains only one colouring</p> <p><b>A</b> is incorrect as drink A contains three colourings</p> <p><b>B</b> is incorrect as drink B contains two colourings</p> <p><b>C</b> is incorrect as drink C contains three colourings</p>		
(ii)	<p><b>M1</b> C</p> <p><b>M2</b> spot moved the furthest/greatest distance</p>	<p>ACCEPT has a spot nearest to water/solvent front</p> <p>ALLOW blob/dot/mark/point/colour/dye for spot</p> <p><b>M2</b> dep on <b>M1</b> correct or missing</p>	

Question number	Answer	Notes	Marks
(iii)	M1 A <u>and</u> C  M2 have spot at same level/travelled same distance	ALLOW spots align/have same $R_f$ values ALLOW blob/dot/mark/point/colour /dye for spot M2 dep on M1	2

3.

Question number	Answer	Notes	Marks
3 (a)	<b>D</b> (filtration)		1
(b) (i)		<p>award one mark for each correct label</p> <p>solvent: ALLOW label line to any point under the solvent level</p> <p>paper: ALLOW label line to paper, including under solvent level</p> <p>original spot: has to be in the centre of the baseline i.e. below the visible spots</p>	3
(ii)	<u>Four</u> because there are <u>four</u> spots/dots (above the baseline in the chromatogram)	ALLOW blobs / marks / colours IGNORE refs to different heights	1

4.

Question number	Answer	Notes	Marks
a i	to prevent spots/them dissolving/mixing (in the solvent) / OWTTE	Accept substance(s)/pigment(s)/dye(s) for spots Ignore references to diffusion/absorption Ignore references to spots smudging/running Accept spots would be washed off/away Ignore water for solvent	1
ii	Any two from:  M1 evaporation /loss of solvent / OWTTE  M2 risk of fire  M3 fumes may be toxic/poisonous	Accept water for solvent Ignore gas escaping  Ignore it is flammable only  Ignore harmful/dangerous  Ignore references to substances entering tank/spillage Ignore references to reaction with air	2
b	M1 cross in box A (chlorophyll is <b>not</b> present in carrots, sweet potatoes or tomatoes)  M2 cross in box C (both beta-carotene and lycopene are present in sweet potatoes)  M3 cross in box E (Both carrots and tomatoes contain a pigment <b>other than</b> beta-carotene, chlorophyll and lycopene)	If more than three answers given mark on list principle: eg four answers given with 3 correct and 1 incorrect scores 2 marks eg all five answers given so 3 correct and 2 incorrect scores 1 mark	3
c	M1 (distance between start line and solvent front) = 6(.0)  M2 correct evaluation of $R_f$ value $1.3/6.0 = 0.22$	Accept answer to 1 or more dp, eg 0.2, 0.217,  Accept 0.216recurring Reject 0.216  correct answer with no working scores 2  M2 CQ on M1	2
d	(there is a substance in sweet potatoes that) does not dissolve/is insoluble (in the solvent)	Ignore mix Ignore water for solvent Reject not very soluble/partially soluble	1

5.

Question number	Answer	Notes	Marks
i (a)	<b>M1</b> – C		1
	<b>M2</b> – (it) has a spot in line with/at the same height as (the spot produced by) bute/an illegal drug	Accept references to travelling same distance / having same $R_f$ value  <b>M2</b> dep on <b>M1</b>	1
(b)	a substance/liquid that dissolves a solute/solid/another substance	Accept it forms a solution with a solute/solid/substance	1
(c)	<b>M1</b> <u>correctly measured distance for lasix spot</u> correctly measured distance of solvent front	Lasix spot 62-64 mm / 6.2-6.4 cm Solvent front 84 mm / 8.4 cm	1
	<b>M2</b> – any value in range 0.73 – 0.77	Minimum of 2 dp correct answer with no working scores 2  <b>M2</b> csq on <b>M1</b>	1
(d)	the more soluble the substance the further it will travel	Allow distance increases with (increasing) solubility ignore any reference to proportionality	1

6.

Question number	Answer	Notes	Marks
a i	B (2)		1
b	FR AND FG	Choice can be indicated by ticks or other marks or Yes	1
	FR and FG/they/colourings/dyes/spots/OWTTE AND line up/match/correspond with/travel same distance(s) as / have same $R_f$ values as AND SR and SG/safe colourings/red and green colourings	<b>M2</b> DEP on <b>M1</b> correct or missing Ignore references to FB unless incorrect  Ignore references to FR and FG containing/being the same as SR and SG	1

7.

Question number	Answer	Accept	Reject	Marks
(a) (i)	D	d		1
(ii)	A	a		1
(b)	<b>M1</b> – B	b		1
	<b>M2</b> – the spots do not line up (with any of the blue, red or yellow spots)  <b>M2</b> dependant on <b>M1</b>	the colours do not match (with any one of blue, red or yellow) the spots are not the same (as those for blue, red or yellow)	contains other colours	1