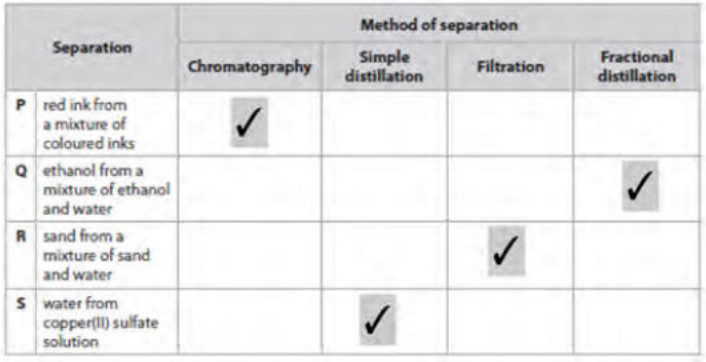
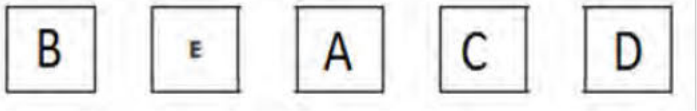
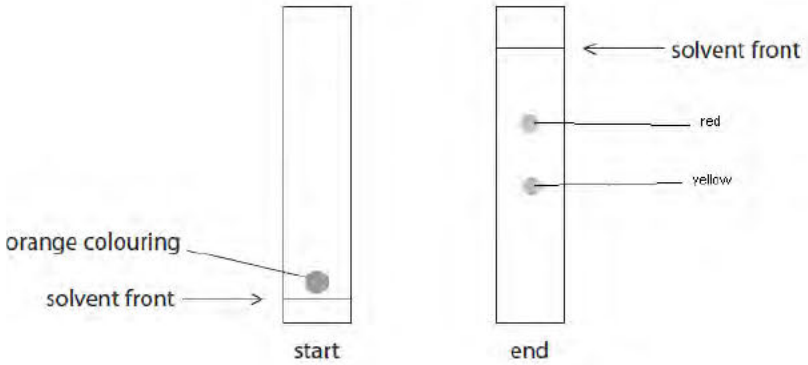
Question number	Answer	Notes	Marks
1 (a)	to stop the dyes from {dissolving / running / going / mixing} into water / smudging OWTTE	Ignore refs to correct statements eg "to allow water to rise up paper". Do not penalise refs to inks. Accept reverse argument based on what happens if water level is above dyes. Reject ref to reaction	1
(b) i) (ii)	C and D insoluble	 Accept does not dissolve in water Reject ref to reaction Reject ref to not enough dye	1 1
(c)	52-55 67-68 0.76-0.82(1)	Penalise use of cm once only in M1 + M2 Do not penalise more than 2sf in M1 – M3 Accept 1sf in M3 M3 CQ on M1 + M2, even for $R_f > 1$	1 1 1

Total 6 marks

Question number	Answer	Notes	Marks
2 a i	tick for P = chromatography tick for Q = fractional distillation tick for R = filtration tick for S = simple distillation 		1 1 1 1
ii	R	Accept (sand from a mixture of) sand and water	1
b		M1 for B in first box AND D in last box M2 for A in box 3 AND C in box 4 M2 dependent on M1 correct	1 1
			Total 7 marks

Question number	Answer	Accept	Reject	Marks
3	**M1** dissolve			1
	M2 solution			1
	M3 evaporate			1
	M4 crystals			1
	M5 filter			1
			Total	**5**

Question number	Answer	Accept	Reject	Marks
4 (a) (i)	the (orange) colouring dissolves in ethanol / does not dissolve in water **OR** the (orange) colouring is more soluble in ethanol (than water) **OR** ethanol is a better solvent (than water) **IGNORE** petals dissolve			1
(ii)	water bath / electric heater / isomantle	description of water bath hot water/steam		1
(iii)	filter / decant / pour off the liquid	use a sieve		1
(b)	**M1** 2 spots/dots/circles drawn at <u>different</u> heights above the original orange spot <u>and</u> <u>below</u> the solvent front **M2** one spot labelled red AND one spot labelled yellow i.e.  	one spot level with the orange spot		1 1
			Total	**5**

Question number				Answer	Notes	Marks
5	a		M1	beaker	Accept phonetic spellings	1
			M2	water		1
			M3	glass rod		1
			M4	funnel		1
			M5	conical flask		1
			M6	water		1
	b	i	M1	(filter) paper	Accept phonetic spellings Ignore alternatives to filter, such as kitchen / chromatography - the essential word is paper	1
		ii	M1	sand	Accept phonetic spellings	1
	c		M1	cross in box 4		1
			M2	cross in box 5		1

Total 10 marks