CAMBRIDGE
INTERNATIONAL EXAMINATIONS

JUNE 2002

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK : 60

SYLLABUS/COMPONENT : 0652/6

PHYSICAL SCIENCE
(ALTERNATIVE TO PRACTICAL)

UNIVERSITY of CAMBRIDGE
Local Examinations Syndicate

Q. No.	Marking Scheme Details	Part Mark
1.	(a)(i) d_1 = 40(cm)	1
	(a)(ii) d_2 = 40(cm)	1
	(a)(iii) l =40(g)	1
	~~(b)(i) 30 x 40 = 1200 [1]~~	~~1~~
	m x 10 = 1200 [1]	1
	m = 120(g) [1]	1
	Some working must be shown to score all 3 marks. Answer alone with no working scores 1. Correct working with incorrect final answer scores 2.	
	(b)(ii) length = 4(cm)	1
	volume = 64 (cm^3)	1
	(c)(i) Arrow shows movement of load to the right/towards the pivot.	1
	(c)(ii) because the load is lighter in water (OWTTE)	1

Q. No.	Marking Scheme Details	Part Mark
2.	(a) Potassium carbonate is more soluble ***because*** it dissolved completely in cold water/produced a colourless solution in cold water. (accept converse statement related to potassium hydrogencarbonate). Answer **MUST** also give explanation to gain mark.	1
	~~(b)(i) pH = 9/10~~	~~1~~
	(b)(ii) pH increases/gets higher	1
	(c) Carbon dioxide (accept CO_2)	1
	(d) Ammonia (accept NH_3) (do NOT accept ammonium or NH_4)	1
	(e) The acid reacts with carbonates/hydrogencarbonates giving carbon dioxide[1] / sulphates do not give off a gas (CO_2) with acid. sulphates would give a white precipitate not a colourless solution[1]	2
	(f) Record temperature of acid ***before and after*** adding powder[1] Add white powder to hydrochloric acid [1] If temperature rises it is potassium carbonate / if temperature falls it is potassium hydrogencarbonate [1]	3

Q. No.	Marking Scheme Details	Part Mark
3.	(a) The coloured substance dissolves better in ethanol than water.	1
	(b) (i) diagram shows closed vessel[1] containing solvent [1] with level of solvent below start line [1]	3
	(b) (ii) diagram shows ***TWO*** spots [1] vertically (by eye) in line [1]	2
	(c) add filtrate to ***named*** acid to see if there is a colour change[1] add filtrate to ***named*** alkali to see if there is a colour change[1]	2

Q. No.	Marking Scheme Details	Part Mark
4.	(a) Readings **78** (mA) [1] **57** (mA) [1] **47** (mA) [1] } Tolerance ± 1mA	3
	(b) All points plotted correctly [1] ~~(Allow ecf from (a))~~	
	suitable line drawn [1] (Allow ecf from (b))	2
	(c) 18mA (Tolerance ± 2mA) (Allow ecf from candidate's graph)	1
	(d) Resistance = 1.5 / 18 x 1000 = 83.3 ohms (Allow ecf from (c))	1
	(e) Circuit drawn showing ammeter in series with the cell and the voltmeter in parallel with the variable resistor [1]	
	Explanation : vary resistance and record current and p.d. each time [1]	
	Plot graph of V against A producing straight line passing through the origin [1]	3

Q. No.	Marking Scheme Details	Part Mark
5.	(a) initial temperature = **19**°C (no tolerance)	1
	final temperature = **84**°C (no tolerance)	1
	(b) rise in temperature = **65**°C (or ecf from Candidate's values from (a))	1
	(c) Heat gained by water = 0.25 x 4200 x 65 = **68250** Joules Calculation must be done i.e. no mark for substitution alone (or ecf from Candidate's value calculated using temp. rise from (b)	1
	(d) Rate = 68250 / 3 = **22750** Joules/min (or ecf from answer to (c) / 3)	1
	(e) No [1] Because heat is lost to surroundings/beaker etc.[1] These marks are NOT independent	2
	(f) Because the temperature would stop rising [1]so that further heat gain could not be measured [1] (OWTTE) Do NOT allow – 'because it will affect the results'	2

Q. No.	Marking Scheme Details	Part Mark
6.	(a) Oil Y – 33 secs (no tolerance)	1
	Oil Z – 49 secs (no tolerance)	1
	(b) Gravity / gravitational force	1
	(c) Oil X because it was slowest/took the longest time (correct oil ***and*** explanation required for the mark)	1
	(d) To ensure that the experiment was fair / so that the conditions were the same each time (OWTTE)	1
	(e) Times would have been longer [1] ***because*** speed depends on mass (OWTTE)[1]	2
	Answers are NOT independent	
	(f) Repeat the readings / obtain results from other students etc.	1

Q. No.	Marking Scheme Details	Part Mark
7.	(a) ANY TWO FROM:- gas evolved was carbon dioxide / CO_2 [1] mixture contained a carbonate / hydrogen carbonate / CO_3^{2-} / HCO_3^{2-} [1] mixture contained **copper** compound / ions / Cu^{2+} [1] (**NOT** contained ***copper***) ∴ mixture contained ***copper carbonate*** would score both marks *Do NOT accept one solid was soluble in acid*	2
	(b) a ***green*** solid in/part of the mixture was insoluble *Do NOT accept 'one solid was soluble and the other was not' – i.e. answer must identify the green solid as insoluble.*	1
	(c) mixture contained a (soluble) chloride (Cl^- ions) *<u>Allow</u> white precipitate was silver chloride*	1
	(d) green solid was a compound of copper / mixture contained a compound of copper Do NOT allow mixture contained ***copper***	1