

JUNE 2002

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK : 60

SYLLABUS/COMPONENT : 0652/6

**PHYSICAL SCIENCE
(ALTERNATIVE TO PRACTICAL)**



Page 1	Mark Scheme	Syllabus	Paper
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Q. No.	Marking Scheme Details	Part Mark	
1.	(a)(i) $d_1 = 40(\text{cm})$	1	
	(a)(ii) $d_2 = 40(\text{cm})$	1	
	(a)(iii) $l = 40(\text{g})$	1	
	(b)(i) $30 \times 40 = 1200$ [1]	1	
	$m \times 10 = 1200$ [1]	1	
	$m = 120(\text{g})$ [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 = $64 (\text{cm}^3)$	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	

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2.	<p>(a) Potassium carbonate is more soluble <i>because</i> it dissolved completely in cold water/produced a colourless solution in cold water. (accept converse statement related to potassium hydrogencarbonate).</p> <p>Answer MUST also give explanation to gain mark.</p>	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 <i>before and after</i> 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

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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 <i>TWO</i> spots [1] vertically (by eye) in line [1]	2
	(c) add filtrate to <i>named</i> acid to see if there is a colour change [1] add filtrate to <i>named</i> alkali to see if there is a colour change [1]	2

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4.	<p>(a) Readings 78 (mA) [1] 57 (mA) [1] 47 (mA) [1] } Tolerance $\pm 1\text{mA}$</p>	3
	<p>(b) All points plotted correctly [1] (Allow ecf from (a)) suitable line drawn [1] (Allow ecf from (b))</p>	2
	<p>(c) 18mA (Tolerance $\pm 2\text{mA}$) (Allow ecf from candidate's graph)</p>	1
	<p>(d) Resistance = $1.5 / 18 \times 1000 = 83.3 \text{ ohms}$ (Allow ecf from (c))</p>	1
	<p>(e) Circuit drawn showing ammeter in series with the cell and the voltmeter in parallel with the variable resistor [1]</p> <p>Explanation : vary resistance and record current and p.d. each time [1]</p> <p>Plot graph of V against A producing straight line passing through the origin [1]</p>	3

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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 = $0.25 \times 4200 \times 65 = 68250$ Joules	1
	Calculation must be done i.e. no mark for substitution alone	
	(or ecf from Candidate's value calculated using temp. rise from (b))	
	(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]	2
	These marks are NOT independent	
(f) Because the temperature would stop rising [1] so that further heat gain could not be measured [1] (OWTTE)	2	
Do NOT allow – 'because it will affect the results'		

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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 <i>and</i> 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] <i>because</i> speed depends on mass (OWTTE)[1]	2
	Answers are NOT independent	
(f) Repeat the readings / obtain results from other students etc.	1	

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Q. No.	Marking Scheme Details	Part Mark
7.	<p>(a) ANY TWO FROM:-</p> <p>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 <i>copper</i>)</p> <p>\therefore mixture contained <i>copper carbonate</i> would score both marks</p> <p><i>Do NOT accept one solid was soluble in acid</i></p> <p>(b) a <i>green</i> solid in/part of the mixture was insoluble</p> <p><i>Do NOT accept 'one solid was soluble and the other was not' – i.e. answer must identify the green solid as insoluble.</i></p> <p>(c) mixture contained a (soluble) chloride (Cl^- ions)</p> <p><u>Allow</u> white precipitate was silver chloride</p> <p>(d) green solid was a compound of copper / mixture contained a compound of copper</p> <p>Do NOT allow mixture contained <i>copper</i></p>	<p>2</p> <p>1</p> <p>1</p> <p>1</p>