Cambridge Assessment International Education

Cambridge IGCSE™

PHYSICS **0625/62**

Paper 6 Alternative to Practical **March 2020**

MARK SCHEME

Maximum Mark: 40

Published

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Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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[Turn over

Question	Answer	Marks
1(a)(i)	l = 4.5 (cm) and d = 2.0 (cm)	1
	both to 1 decimal place	1
1(a)(ii)	method outlined /	1
	how diameter determined accurately e.g. use of string wrapped round rod <u>and</u> measured / several turns <u>and</u> calculate diameter from circumference, OR use of rod between two blocks and measure gap / in at least 2 places and <u>take average</u>, OR means of measuring diameter across ends / at several places and <u>take average</u>, OR use of micrometer, (vernier) callipers / at various points (along length or across ends) and <u>take average</u>	1
1(b)	m present <u>and</u> ρ_1 = 0.55 / ecf	1
	correct unit (g / cm^3)	1
1(c)	V_1 = 144 (cm^3) <u>and</u> V_2 = 152 (cm^3)	1
1(d)	ρ_2 = 0.57 / ecf	1
	ρ_1 and ρ_2 to consistent 2 or consistent 3 significant figures	1
1(e)	straight arrow perpendicular to measuring cylinder	1

Question	Answer	Marks
1(f)	suitable source of inaccuracy e.g.: measuring cylinder scales less precise / accurate, water lost on transfer / droplets on clay, wood might absorb water	1

Question	Answer	Marks
2(a)	θ_R = 21 (°C)	1
2(b)(i)	s, °C both correct in heading	1
2(b)(ii)	suitable precaution e.g.: line of sight perpendicular to scale wait until reading stops rising (at start) stir before reading keep thermometer at same depth	1
2(c)(i)	x_1 = 0.18	1
2(c)(ii)	unit °C / s, seen in **(c)** and not contradicted	1
2(c)(iii)	x_3 = 0.07 and x_2 = 0.12	1
2(d)(i)	cooling rate decreases (over time) and justified by comparative values of cooling rate over suitable periods of time	1
2(d)(ii)	$\theta_F = \theta_R$	1

Question	Answer	Marks
2(e)(i)	suggestion matching results	1
	explanation matching suggestion: EITHER: SUGGESTION: smaller cooling rates (at equivalent times) EXPLANATION: reference to cooling rate being smaller at lower temperatures and values stated OR SUGGESTION: smaller difference(s) in cooling rates (between equivalent times) EXPLANATION: clear reference to ($x_2 - x_3$) being smaller than ($x_1 - x_2$)	1
2(e)(ii)	suitable control: (same) volume of water, (same) material of beaker, (same) duration of experiment, (same) room temp / named appropriate environmental condition	1

Question	Answer	Marks
3(a)(i)	V = 2.1 (V) and I = 0.26 (A)	1
3(a)(ii)	R_0 = 8.1 / ecf	1
3(b)	1 / I = 2.86	1

Question	Answer	Marks
3(c)	graph:	
	• axes labelled with quantity and unit	1
	• appropriate scales (plots occupying at least ½ grid)	1
	• plots all correct to ½ small square and precise plots	1
	• well judged line and thin line	1
3(d)(i)	*G* present and triangle method seen on graph line	1
3(d)(ii)	*E* in range 2.0 (V) to 2.9 (V)	1
3(e)	l = 30(.0) cm	1
	reference to ammeter forming greater proportion of total resistance	1

Question	Answer	Marks
4	**MP1** **circuit diagram:** ammeter in series with resistor and circuit correct	1
	MP2 **apparatus:** ammeter and means of measuring candidate's independent variable if other than air speed e.g. (metre) rule if distance is independent variable, protractor if angle of air flow is independent variable	1

Question	Answer	Marks
4	**MP3** **control variable** (one from)**:** speed of fan (if distance / angle varied) or distance / angle between fan and turbine (if fan speed varied), height of fan / turbine, angle of air flow	**1**
	MP4 **method:** measure / record independent variable (allow turbine to turn and) measure / record current,	**1**
	MP5 repeat for different value of independent variable	**1**
	MP6 **analysis:** compare readings (in a table) to see if change in independent variable produces change in current / plot line graph (with correct axes specified)	**1**
	MP7 **additional point** (one from)**:** at least 5 sets of data taken, repeat each measurement and take average, 2nd valid control variable stated, repeat for different resistor and compare pattern preliminary experiment to determine suitable range for independent variable measure air speed at same point each time	**1**