Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

PHYSICS **0625/63**

Paper 6 Alternative to Practical **October/November 2017**

MARK SCHEME

Maximum Mark: 40

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2017 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

Question	Answer	Marks
1(a)	units ALL correct (symbols or words)	**1**
	t values all present (0, 30, 60, 90, 120, 150 and 180)	**1**
1(b)	**two** appropriate precautions, e.g.: avoidance of parallax(only if explained), wait until reading stops rising at start, ensure thermometer not touching beaker	**2**
1(c)(i)	conclusion matching results	**1**
	correct mention of comparative temperature change over 180 s	**1**
1(c)(ii)	any suitable improvement relating to comparison: e.g. same volume of water, same initial temperature, insulate sides, use plastic beaker, stand on mat, use a thicker / more insulated lid,	**1**
	matching explanation: e.g. lid only factor changed, cooling more rapid for higher temperatures, cooling different for different volumes, thermal energy only escapes from surface, less transfer of thermal energy by sides, effect of lid more marked	**1**
1(c)(iii)	any appropriate similarity: e.g. both cool more rapidly at the start	**1**
1(d)(i)	23 (°C)	**1**
1(d)(ii)	any suitable suggestion with a valid explanation greater temperature at end as cannot fall below room temperature, lower rate of cooling as temperature difference between water and room is smaller	**1**

Question	Answer	Marks
2(a)	correct voltmeter symbol in parallel with **X**	**1**
2(b)	I_S = 0.18 (A)	**1**
2(c)(i)	V_X = 1.2 (V) AND V_Y = 2.3 (V)	**1**
2(c)(ii)	correct units (A, V) seen in **(b)** and **(c)**	**1**
2(c)(iii)	statement matching readings	**1**
	justification, with use of values seen, matching readings and statement e.g: '3.5 V and 3.7 V are within limits of expt accuracy'	**1**
2(d)	correct calculation of *R*s (20.6)	**1**
	2 / 3 sig figs and unit(Ω)	**1**
2(e)(i)	resistors in parallel with correct symbol	**1**
	rest of circuit correct	**1**
2(e)(ii)	valid suggestion AND explanation consistent with results	**1**

Question	Answer	Marks
3(a)(i)	F = 0.75	**1**
3(a)(ii)	any reliable method e.g. equal distances between rule and bench in at least two places, line up with named horizontal surface, use of set-square between stand and rule	**1**
3(b)	graph:	
	axes labelled with quantity and unit	**1**
	appropriate scales (plots occupying at least ½ grid and scales starting at 0,0)	**1**
	plots all correct to ½ small square AND precise plots	**1**
	Well-judged line AND thin line	**1**
3(c)(i)	F_0 correct from graph	**1**
3(c)(ii)	W_R in range 0.90 to 1.4	**1**
	2 / 3 sig figs and unit (N)	**1**
3(d)	statement matching plotted points AND explanation referring to line and scatter of data	**1**
3(e)	repeat all readings and take average	**1**

Question	Answer		Marks
4	**MP1**	**additional apparatus:** screen AND (metre) rule	**1**
	MP2	**diagram:** suitable arrangement of apparatus with *u* & *v* labelled correctly	**1**
	MP3	**method:** obtain (clear focused) image AND measure *u*, *v*	**1**
	MP4	repeat for other values of *u*	**1**
	MP5	**one precaution for clear, focused image:** move screen slowly / backwards and forwards, object AND lens AND screen perpendicular to bench / vertical, object and lens at same height (from bench), use of dark room / bright light	**1**
	MP6	**one precaution with measurements:** clamp rule / fix to bench, mark centre of lens on holder avoidance of parallax explained and specific	**1**
	MP7	**one additional point:** additional precaution, calculate *f* <u>from given equation</u> at least 3 values obtained, calculate average, mention of at least one appropriate *u* value, mention of preliminary expt to obtain rough *f* value (e.g. light from window)	**1**