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IGCSE Physics 4420 03 4437 09
Mark Scheme (Results)
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IGCSE

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IGCSE PHYSICS 4420-03 / 4437 09 MARK SCHEME

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
1 (a)	55 (g)		any other answer	**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
1 (b)(i)	measuring cylinder	graduated cylinder	just 'cylinder'	**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
1 (b)(ii)	68 (cm^3)		64	**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
1 (b)(iii)	18 (cm^3)	allow candidate's answer to (b)(ii) – 50 example (64 – 50 =) 64 (cm^3)		**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
1 (c)(i)	3.1	or correct to 2 sig. fig. from candidate's answer to (b)(iii) and mass shown as any value other than 68 or correct calculation = 3.06 or from candidate's answer to (b)(iii) and mass shown as any value other than 68		**2** **1** **(2)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
1 (c)(ii)	readings (of mass / volume) (only) to 2 sig. fig. (so) the calculation/density cannot be more accurate (than this)			**1** **1** **(2)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
1 (d)(i)	density is the same the stones are the same type/rock /material /substance	or 'mass is (directly) proportional to volume'(2) marks or 'volume is (directly) proportional to mass' (2) marks		**1** **1** **(2)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
1 (d)(ii)	no because results not particularly precise e.g. she read the volume to the nearest 5 g e.g the mass of stone P is really between 29.5 and 30.5 e.g. the density of stone P could be 30.5 ÷ 10.5 (= 2.9 g/cm^3 to 2 sig. fig.)	or words to that effect accept any reasonably qualified comment or any other similar example	do not credit 'yes' or just 'no'	**1** **1** **(2)**

(Total 12 marks)

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
2 (a)(i)	torch <u>with slit</u> /ray box/ laser/light box /ray projector		just 'torch' just 'lamp'	**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
2 (a)(ii)	mark two points (with a pencil) (and connect with a ruler)		just 'use a ruler'	**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
2 (a)(iii)	22 (degrees)		any other response	**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
2 (b)	17 (degrees)		any other response	**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
2 (c)(i)	appropriate headings <u>all</u> in order unit given as degrees	description of x e.g. angle between start and new position of mirror description of y e.g. angle between incident ray and reflected ray seen anywhere at least once and no contradiction example *x* measured in ˚ *y* measured in 6 39 11 49 17 57 19 65 23 73 25 77		**1** **1** **1** **(3)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
2 (c)(ii)	both axes labelled *x* on the X axis **and** *y* on the Y a all points plotted correctly i.e. to within 1 mm 17,57 identified as anomalous/ unexpected straight line for the <u>other</u> point	 incorrect (-1) each dow to (0) for points a 'blob' (more than half a small square across is incorrect do not give consequential credit for mistakes		**1** **1** **3** **1** **1** **(7)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
2 (c)(iii)	67 (degrees)	correct reading from candidate's gr to within 1 mm (half a small square)		**(1)**

(Total 15 marks)

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
3 (a)	to reduce heat loss (from the (small) beaker)	allow 'to stop/prevent heat loss' or to insulate the beaker	do not credit any suggestion of electrical insulation or prevention of breakage	**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
3 (b)	(gently) stir (the water before taking the temperature)			**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
3 (c)(i)	5.4 6.8	5.40… 6.80…		**1** **1** **(2)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
3 (c)(ii)	ammeter	ameter ametre	ampmeter a meter current meter	**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
3 (c)(iii)	voltmeter	volt meter	Voltameter voltage meter	**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
3 (c)(iv)	23 (˚C) <u>and</u> 31 (˚C) 8 (˚C)	or correct difference between candidate's readings. e.g. 37 and 49 to give 12		**1** **1** **(2)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
3 (d)	Any two (2) each appropriate point (1) amplification or linked point (1)	**examples** heat loss (1) by evaporation / from the surface of the water (1) readings would not be constant / would change(1) because of increase / change in resistance(1) some heating taking place while the variable resistor being adjusted(2) (very) difficult to ensure identical mass of water (1) because some drops remain in measuring cylinder(1) (very) difficult to ensure identical starting temperature (1) because room temperature not constant (1) temperature will not exceed 100 ^{o}C (1) when water boils (1)	do **not** accept responses such as 'the thermometer/ timer may not be accurate'	**2** **2** **(4)**

(Total 12 marks)

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
4 (a)	straight line drawn **and** instructions followed **and** point D marked			**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
4 (b)	instruction followed			**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
4 (c)	instructions followed	must be labelled 'normal' and must point to 'l a' in the words 'oil and' or must be at 90^{o} to the surface		**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
4 (d) (i)	60 (degrees)	in the range 59 ↔ 61		**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
4 (d) (ii)	35 (degrees)	in the range 34 ↔ 36		**(1)**

Question Number	Correct Answer	Acceptable Answers	Reject	Mark
4 (e)	any two (3) each relevant problem identified (1) appropriate solution indicated (1) explanation/expansion (of either) (1) scope for a wide variety of responses the examples show the principles of the mark scheme	**examples** difficult to see the path of the light (1) through some kinds of oil (1) so use a (very) transparent oil (1) difficult to mark the path of the light (1) so use a transparent container of oil (1) lift up so you can see where the light arrives on (the inside of) the bottom of the container (1) difficult to measure the angles (1) use a 360˚ protractor (1) held so that the 0˚ - 180˚ line is along the surface of the oil (1)		**3** **3** **(6)**

(Total 11 marks)

PAPER TOTAL 50 MARKS