Temperature Mark Scheme 2

Level		International A	Level	
Subject		Physics		
Exam Board		CIE		
Торіс		Temperature		
Sub Topic				
Paper Type		Theory		
Booklet		Mark Scheme 2		
Time Allowed:	32 minutes			
Score:	/26			
Percentage:	/100			
A* A	В	C D)N -E	U
>85% '77.5%	70%			- 4 5 0/

(a e e a	e.g. two objustment same m e.g. tempera from hig e.g. when so heat inp my two, M1	ects of different masses at same temperature naterial would have different amount of heat ature shows direction of heat transfer gh to low regardless of objects ubstance melts/boils but but no temperature change 1 + A1 each, max 4	(M1) (A1) (M1) (A1) (M1) (A1)	[4]
(b) (i	i) energy either or	losses (to the surroundings) increase as the temperature rises rise is zero when heat loss = heat input	M1	[2]
(ii	i) idea of power 54 = 0 c = 91	input <u>power</u> = maximum <u>rate</u> of heat loss = $m \times c \times \Delta \theta / \Delta t$ $0.96 \times c \times 3.7 / 60$ 0 J kg ⁻¹ K ⁻¹	C1 C1 A1	[3]

[Total: 9]



1

2	(a	gradient of graph is (a measure of) the sensitivity the gradient varies with temperature			[2]
	(b)	204 <i>T </i> I tem	0 ± 20 Ω corresponds to 15.0 ± 0.2 °C K = <i>T</i> / °C + 273.15 (allow 273.2) perature is 288.2 K	C C1 A1	[3]
3	(a	l) v t	variation is non-linear 1 wo possible temperatures 1	[2]	
	(b)) e	 e.g. 1. small thermal capacity/measure <i>∆θ</i> of small object /short response time 2 readings taken at a point/physically small 3 can be used to measure temperature difference 4 no power supply required etc. (any two, 1 mark each) 	[2]	
4	(a)	to co outp	ompare two potentials / voltages out depends upon which is greater	M1 A1	[2]
	(b)	(i)	resistance of thermistor = $2.5 k\Omega$ resistance of X = $2.5 k\Omega$	C1 A1	[2]
		(ii)	at 5 °C / at < 10 °C, $V^- > V^+$ so V_{OUT} is -9V at 20 °C / at > 10 °C, $V^- < V^+$ and V_{OUT} is +9V V_{OUT} switches between negative and positive at 10 °C (allow similar scheme if 20 °C treated first)	M1 A1 B1 B1	[4]