JURONGVILLE SECONDARY SCHOOL
PRELIMINARY EXAMINATION 2022
Secondary 4 Normal (Academic)
Science Physics

Answer Scheme

Paper 1 [20 marks]

1	2	3	4	5	6	7	8	9	10
B	C	D	D	B	C	C	A	B	A
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
C	C	C	D	B	B	D	B	A	B

Paper 2 [30 marks]

Section A – 14 marks

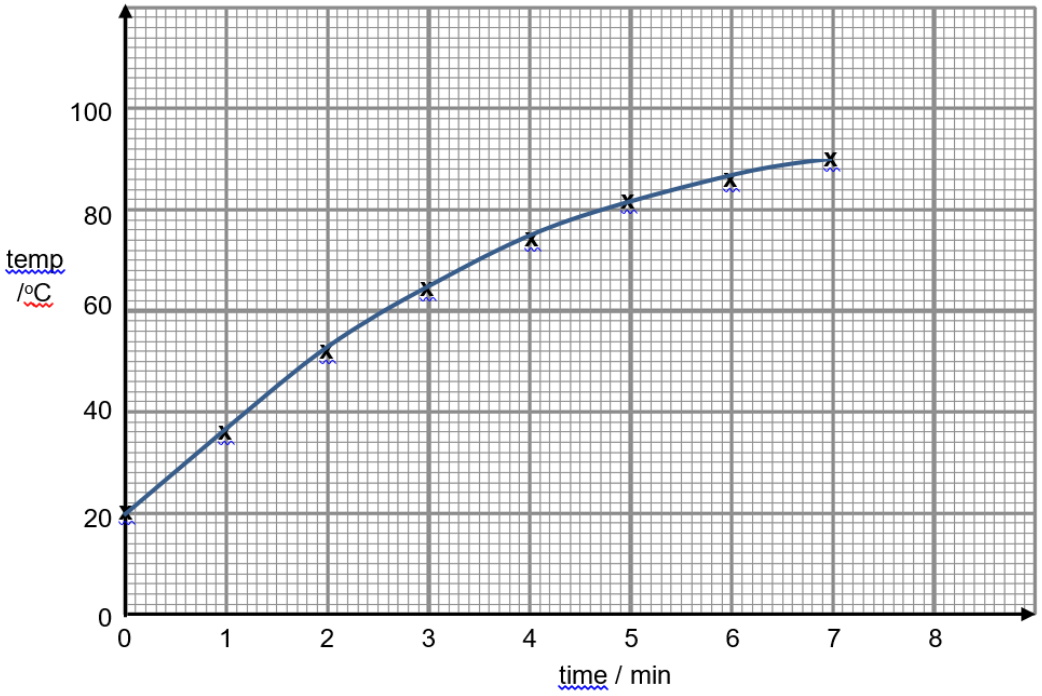
1a	mark at the <u>lowest point</u>	**1**	
1b	max KE = max GPE = <u>0.8</u> X 10 X 3 [1]	**1**	
1c	= 24 J [1]	**1**	
			3 marks
2a	Distance = 400 m	**1**	
2b	Average speed = 250 / 35	**1**	
	= 7.14 m/s (3 sf)	**1**	
			3 marks

[Turn over

3a	Clockwise moments = (480000 x 20) = 9600000 Nm	**1**	
3b	CW = ACW W x 3m = 9600000 Nm W = 3200000 N	**1** **1**	
			3 marks
4a	Time = 95 s (accept 94 – 96 s)	**1**	
4b	The <u>intermolecular bonds are being formed</u> during freezing and only the internal <u>potential energy of the molecules decreases.</u> [1]	**1**	
	The temperature remains constant as there is <u>no change in the kinetic energy</u> of the molecules. [1]	**1**	
			3 marks
5a	Amplitude = 2.4 – 2.5 cm	**1**	
5b	Wavelength = 7.8 – 7.9 cm	**1**	
			2 marks

Section B – 16 marks

6a



(i) plots [1]
line of best fit (curve) [1] **2**

(ii) 3.4 min to 3.6 min [1] **1**

6b **(i)** Pot **L** [1] as black and dull object is a good emitter of radiation [1] so the kettle will lose heat the fastest**.** **2**

(ii) Pot **J** [1] as white and shiny object is a poor emitter of radiation [1] and the cork mat will further reduce heat loss through conduction [1] to the metal table top. **3**

			8 marks
7ai	P – X-ray Q – visible light R – infrared radiation S – microwave Note: every two correct answers = 1m	**2**	
7aii	$f = \frac{v}{\lambda}$ $f = \frac{3 \times 10^{8}}{700 \times 10^{-9}}$ f = 4.28 x 10^{14} Hz	**1** **1**	
7b	Sound needs a <u>medium</u> to travel. [1] No air in space (vacuum). [1]	**1** **1**	
7c	Distance = 1 500 x 0.4 = 600 m	**1** **1**	
			8 marks
8ai	R_{xy} = (¼ + ¼) $^{-1}$ = 2 Ω R_{eff} = 2+4 = 6 Ω	**1** **1**	
8aii	I = 10 / 6 = 1.67 A (3 sf)	**1**	
8aiii	V = (10/6) x (2) = 3.33 V (3 sf)	**1** **1**	
8bi	1.2 x (4/60) x 30 = 2.4 kWh	**1** **1**	
8bii	2.4 (0.25) = $0.60	**1**	
			8 marks