

COMPONENT NUMBER: PH2HP

COMPONENT NAME: GCSE Additional Science Physics 2H

STATUS: Specimen V1.0

question	answers	extra information	mark
1(a)(i)	spilling boiling / hot water	accept any sensible suggestion	1
	suitable precaution to reduce risk from hot water eg	accept any sensible answer but must be linked to the named risk	1
	clamp the probe / complete the experiment standing		
1(a)(ii)	3 (V)	allow 1 mark for substitution into correct equation ie 0.5×6	2
1(b)(i)	resistance of thermistor decreases		1
	therefore the current in the circuit increases		1
	causing a bigger share of the p.d. across 6Ω resistor		1
1(b)(ii)	0 – 100 (°C)	accept 10 – 100°C	1
1(b)(iii)	20°C to 40°C		1
	because a small temperature change gives a bigger voltmeter reading change		1
1(c)	thermostat	accept a correct description of a use	1
Total			11

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question	answers	extra information	mark
2(a)	Y and Z	both required, either order	1
	same number of protons		1
2(b)	fusion	correct order only	1
	energy		1

2(c)

Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 2.

0 marks	Level 1 (1-2 marks)	Level 2 (3-4 marks)	Level 3 (5-6 marks)
No relevant content.	There is a brief description of the life cycle of a star like the sun.	There is some description of the life cycle of a star like the sun.	There is a clear and detailed description of the life cycle of a star like the sun.
examples of the physics points made in the response <ul style="list-style-type: none"> gases and dust pulled together by gravity nuclear fusion begins when forces are balanced star is stable expands cools becomes a red giant shrinks temperature rises glows much brighter becomes a white dwarf 			extra information to score full marks either the term red giant or white dwarf must be used do not accept red supergiant any mention of supernova negates a mark any mention of black hole negates a mark individual points must be linked in a correct sequence

Total			10
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question	answers	extra information	mark
3(a)(i)	cosmic		1
3(a)(ii)	longer the flight time, greater the dose	accept positive correlation do not accept directly proportional	1
3(a)(iii)	accept any value between 0.055 and 0.062 inclusive		1
	receive higher dose than an 8 hour flight but less than an 11 hour flight		1
3(b)	he should not be concerned because additional dose is very small (1,5) / additional dose is only 1,5	accept 0,75 for 1,5	1
	which is well below the dose that may cause cancer		1

Question 3 continues on the next page . . .

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Question 3 continued . . .

question	answers	extra information	mark
3(c)	almost the same number of non-aircrew developed leukaemia / cancer		1
	therefore other factors could be involved	accept specific examples for either aircrew or other sample	1
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question	answers	extra information	mark
5(a)	1.25	allow 1 mark for correct resultant force ie 1500 N	3
		allow 2 marks for correct transformation and substitution ie $\frac{1500}{1200}$	
	m/s ²	allow 1 mark for a correct transformation but clearly substituting an incorrect value for force eg = $\frac{3500}{1200}$	1
5(b)	as speed increases so does the size of the drag force	accept frictional force / resistive force / air resistance for drag	1
	eventually the drag force becomes equal to the thrust		1
	the resultant force is now equal to zero and therefore there is no further acceleration		1
5(c)	the car and van will reach top speed when the forward force equals the drag force	accept air resistance / frictional / resistive force for drag force	1
	the drag force at any speed is smaller for the car than for the van		1
	as the car is more streamlined		1
	therefore the car's drag force will equal the forward force at a higher speed		1
		allow converse throughout	
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question	answers	extra information	mark
6(a)	50 hertz		1
6(b)(i)	a flow of charge / electrons		1
6(b)(ii)	a.c. is constantly changing direction		1
	whilst d.c. always flows in the same direction		1
6(c)(i)	46.9	accept 47.0 allow 1 mark for correct transformation and substitution ie $\frac{10800}{230}$	2
6(c)(ii)	current (46.9 A) exceeds maximum safe current for 2.5 mm ² cable	accept cable needs to be 16.0 mm ²	1
	therefore if a 2.5mm ² cable were used it would overheat / melt	cable needs to be 10.0 mm ² limits maximum credit to 1 mark	1
6(c)(iii)	can be reset		1
	disconnects circuit faster (than a fuse)		1
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question	answers	extra information	mark
7(a)	35 (m)	allow 1 mark for indicating the correct area allow 1 mark for obtaining correct figures from the graph allow 1 mark for calculating area of triangle (25) but omitting the rectangle underneath (2 x 5)	3
7(b)	86400	allow 1 mark for correct substitution into the correct equation ie $1/2 \times 1200 \times 12^2$	2
Total			5