PHYSICS 2

FOUNDATION TIER

Question			Marking details	Marks Available
1.	*(a)*		Isotope	1
	(b)		4	1
	(c)		[Very] high temperatures are reached [inside the vessel] (1) [Very] high pressure [inside vessel] (1)	2
			Question total	**[4]**
2.	*(a)*		*P* = 230 x (10 (1)) = 2300 (1) W[atts] (1) accept 2.3 kW	3
	(b)		32 A	1
	(c)		230 [V]	1
			Question total	**[5]**
3.	*(a)*		The line is not straight	1
	(b)		Any 2 marks from 3: [Overall] stopping distance reduced / 20 [m] / 10 [m] (1) OR halved (2 marks)	2
	(c)	(i)	Overall stopping distance = 100 [m] (1) Speed = 30 [m/s] (1). (Allow **ecf** from stopping distance)	2
		(ii)	Mobile phone (1), drunk driver (1)	2
			Question total	**[7]**

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Physics 2 Foundation Tier (Contd.)

Question			Marking details	Marks Available
4.	*(a)*		$\frac{50000}{20}$ (substitution (1)) = 2 500 [m/s] (1)	2
	(b)		EITHER: Every object continues its motion in a straight line (1) unless acted upon by an (external) force (1) OR There is no air resistance / friction / gravity [in space] (1), so no force is needed to equal / overcome it (1) **The 2nd mark must be linked to the 1st mark.**	2
	(c)		Speed increases / force is produced (1) momentum = mass x speed / which causes a change in momentum (1) OR momentum given to burnt fuel (1) = momentum supplied to rocket (1) **The 2nd mark must be linked to the 1st mark.**	2
	(d)		$F = \frac{360000 - 200000}{8} =$ (substitution (1)) = 20 000 [N] (1)	2
			Question total	**[8]**

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Physics 2 Foundation Tier (Contd.)

Question			Marking details	Marks Available
5.	*(a)*		Imbalance between numbers of protons and neutrons	1
	(b)	(i)	5 [hours]	1
		(ii)	50 [counts per minute]	1
		(iii)	Yes (1), short [enough] half life [so decays from the body in a few days] (1) and [gamma emitter] so it can escape the body [for detection] (1)	3
			Question total	**[6]**
6.	*(a)*		0.6 A	1
	(b)		Symbol in parallel with the lamp (1) circle with V in anywhere (1)	2
	(c)		Answer = 15 [Ω]	1
		(i)	Increases	1
		(ii)	Decreases / halves	1
			Question total	**[6]**
7.			**Indicative content:** The absorption of slow neutrons can induce fission of Uranium-235 nuclei, releasing energy and the emission of neutrons from such fission can lead to a sustainable chain reaction. The moderator slows down the neutrons for fission to occur. The control rods control the rate of fission by absorbing a proportion of the neutrons. **5 – 6 marks** The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar. **3 – 4 marks** The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.	6

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Physics 2 Foundation Tier (Contd.)

Question			Marking details	Marks Available
7.			**1 – 2 marks** The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar. **0 marks** The candidate does not make any attempt or give a relevant answer worthy of credit. **Question Total**	**[6]**
8.	*(a)* *(b)* *(c)*		[High energy] / [fast moving] electron Beta absorbed / can't get out of the body (1) so damages / ionises cells (1) **The 2nd mark must be linked to the 1st mark.** Both nuclei contain the same number of (53) protons / proton number (1) different numbers of neutrons / mass number / nucleon number (1) 78 neutrons in I-131 & 74 in I-127 / difference of 4 neutrons (1) **Question Total**	1 2 3 **[6]**
9.	*(a)* *(b)* *(c)* *(d)*	 (i) (ii) (iii) (i) (ii)	0.2 [s] Line is steepest $a = \frac{8(1)}{(2-0.2)(1)}$ allow **ecf** from (a) = [4.44] (1) m/s ^{2} (1) Subs 4.44 x 94 (1) = 417.36 (accept 417 - 418) [N] (1) Allow **ecf** from (b)(ii) C to D because longest time (1) at highest velocity (1) OR area under graph (1) with the term "is greatest" or equivalent (1) **The 2nd mark must be linked to the 1st mark.** Straight line from D to axis (1) final coordinate (12.5, 0) (1) Allow ± ½ square. **Question Total**	1 1 3 2 1 2 2 **[12]**
			Foundation Tier Total	**60**

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