

Question number	Answer	Notes	Marks
3 (a)	<p>one mark for each correct line;; -1 for each additional line</p> <p>Part of reactor</p> <p>Function</p> <pre> graph LR subgraph Part_of_reactor CR[control rod] M[moderator] end subgraph Function R1[releases neutrons] R2[cools neutrons] R3[slows neutrons] R4[absorbs neutrons] end CR --- R4 M --- R3 </pre>		2
(b)	<p>any four from:</p> <p>MP1. a <u>nucleus</u> absorbs a <u>neutron</u>;</p> <p>MP2. unstable nucleus formed/eq;</p> <p>MP3. <u>nucleus</u> splits;</p> <p>MP4. (two or more) neutrons released;</p> <p>MP5. (two) daughter nuclei formed;</p> <p>MP6. energy released;</p>	<p>allow neutron { hits/strikes/collides with } nucleus ignore references to speed of neutron neutron is shot at nucleus allow unstable isotope, unstable atom metastable isotope ignore unbalanced must be clear that it is the nucleus that is splitting</p> <p>allow three daughter nuclei ignore cells, atoms, isotopes for nuclei allow idea of gamma radiation emitted</p>	4

Total for Question 3 = 6 marks

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5 (a) (i)	amplitude decreases (with distance); wavelength is constant; speed is constant;		3
(ii)	A (there was a time delay for signals travelling to the probe from Earth); B is incorrect because although the statement is correct it does not explain why the probe is difficult to steer C is incorrect because although the statement is correct it does not explain why the probe is difficult to steer D is incorrect because it contains incorrect Physics		1
(iii)	C; A is incorrect because all radio signals travel at the same speed B is incorrect because all radio signals travel at the same speed D is incorrect because it is easier to remove noise from a digital signal		1
(iv)	B; A is incorrect because the signal shows varying amplitude with more than two values C is incorrect because the signal shows varying amplitude with more than two values D is incorrect because the signal shows varying amplitude with more than two values		1
(b)	substitution; evaluation; e.g. (power =) 36.4×0.275 (power =) 10.0 (kW)	allow 10.01, 10	2