Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic : 6_Radioactivity

Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Mark Schemes

Q1.

	Answer	Additional guidance	Mark
	A description to include **two** from: (radioactive material/substances) inside the food/body (1) emit radiation from inside the body (1) damage body cells (1)	 trapped in the body exposed to radioactivity cause cancer	**(2)** **AO1**

Q2.

Question number	Answer	Mark
CS2	B ionising and emitted by unstable nuclei A is incorrect stable nuclei do not give radioactive emissions C is incorrect not all radioactive emissions are neutral D is incorrect not all radioactive emissions are neutral	(1) AO1

Q3.

Question number	Answer	Additional guidance	Mark
	A description to include any three of the following		**(3)**
	(smaller) nuclei / atoms / particles (1)	two named eg hydrogen (nuclei)	
	come together / join (1)	allow fuse not 'bond'	
	to produce a larger nucleus / atom / particle (1)	helium for nucleus	
	needing high temperature / pressure (1)	accept fast (moving) nuclei	
	overcoming repulsion (between nuclei) (1)		
	energy released (1)	ignore energy created	

Q4.

	Answer	Additional guidance	Mark
	description to include: proton (1) becomes a neutron (1)	 award 2 marks for p → n award 2 marks for answers in terms of quarks: u→d or up → down or uud→udd if no other mark scored, allow 1 mark for any **one** of neutron becomes proton n → p d→u decrease in atomic number <u>by one</u> mass number stays the same gains a neutron reduce charge (of nucleus) <u>by one</u> responses referring to emission of gamma or neutrino	**(2)** **AO1**

Q5.

Question Number	Answer	Additional guidance	Mark
	processing (1) $\frac{125\,000}{1\,000\,000}$ OR $\frac{1}{8}$ OR 3 half-lives or 3 x 5700 evaluation (1) 17 100	 accept an appropriate attempt using more than one halving 17 000 award full marks for the correct answer without working	**(2)**

Q6.

Question number	Answer	Additional guidance	Mark
CS2	same number of protons (1) different number of neutrons (1)	same atomic number different mass number	(2) AO2

Q7.

Question number	Indicative content	Mark
	Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative content below is not prescriptive, and candidates are not required to include all the material which is indicated as relevant. Additional content included in the response must be scientific and relevant. AO1 1 **(6 marks)** <u>Arguments for using nuclear power</u> • we are running out of fossil fuels SO the use of nuclear can play its part where we have previously used fossil fuels • no carbon emissions SO does not contribute towards global warming, rise in sea-levels etc. • low running costs SO a good economical alternative to other power sources • with reprocessing can last hundreds of years • large power output compared with wind farms / solar etc. <u>Arguments against using nuclear power</u> • expensive to set up and decommission SO the use of other sources could be more economical • nuclear disasters possible SO there could be a loss of life / contamination of an area • nuclear toxic waste lasts a long time • waste storage issues – contamination of ground water • terrorism / bomb making	**(6)Exp**

Level	Mark	Descriptor
	0	• No rewardable material.
Level 1	1-2	• Demonstrates elements of physics understanding, some of which is inaccurate. Understanding of scientific ideas lacks detail. (AO1) • Presents an explanation with some structure and coherence. (AO1)
Level 2	3-4	• Demonstrates physics understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas is not fully detailed and/or developed. (AO1) • Presents an explanation that has a structure which is mostly clear, coherent and logical. (AO1)
Level 3	5-6	• Demonstrates accurate and relevant physics understanding throughout. Understanding of the scientific ideas is detailed and fully developed. (AO1) • Presents an explanation that has a well-developed structure which is clear, coherent and logical. (AO1)

SUMMARY, for guidance

Level	Mark	Additional Guidance	General additional guidance – the decision within levels e.g. - At each level, as well as content, the scientific coherency of what is stated will help place the answer at the top, or the bottom, of that level.
	0	No rewardable material.	
Level 1	1–2	Additional guidance Unbalanced incomplete argument Elements of physics present isolated knowledge for or against	Possible candidate responses no CO_2 emissions high cost
Level 2	3–4	Additional guidance Argument linked with evidence, but not entirely coherent or balanced Uses evidence for **or** against but lacks balance / focus / with logical connections made on one side and statement from the other	Possible candidate responses no CO_2 emissions so no contribution to global warming large power output compared with wind farms
Level 3	5–6	Additional guidance Developed detailed arguments, including use of evidence, advanced both for **and** against the use of nuclear power	Possible candidate responses no CO_2 emissions so no contribution to global warming large power output compared with wind farms nuclear toxic waste lasts a long time