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

Name of the Student:_____
Max. Marks : 25 Marks **Time : 25 Minutes**

Mark Schemes

Q1.

Question number	Answer	Additional guidance
	A description to include any three of the following	
	(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

Q2.

Question number	Answer	Additional guidance	Mark
	A description including **one** from hydrogen nuclei/atoms join (1) helium is produced (1) **one** from lost (total) mass (1) mass is converted to energy (1)	 nuclei/atoms join larger/heavier nucleus produced energy is released	**(2)** **AO1**

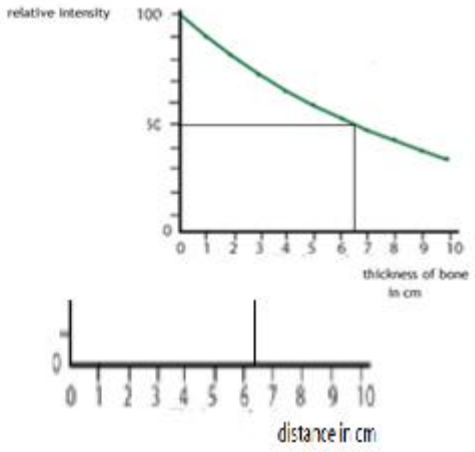
Q3.

Question number	Answer	Additional guidance	Mark
	description to include any **two** from: (two) isotopes/nuclei/atoms (1) fusing (1) release / emit energy (1) decrease in mass (1)	hydrogen joining / coming together allow heat for energy	**2** **AO1.1**

Q4.

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)**

Q5.

Question Number	Answer	Additional guidance	Mark
(i)	Constructs a line across at an intensity of 50 (with a vertical to the thickness axis) (1) e.g.  (thickness =) 6.5 - 6.7 (cm) (1)	award full marks for the correct answer without working	(2)

Question Number	Answer	Mark
(ii)	**The only correct answer is B J/kg** None of the other options have units which are the same as J/kg	(1)

Q6.

Question Number	Answer	Additional guidance	Mark
(i)	a description referring to: fusion involves coming together / joining of particles / nuclei / atoms (1) fission involves (larger) particle(s) / nuclei /atoms breaking up (1)	 not just 'fuse together' that's just restating – more explanation needed particles etc. coming apart / separating no marks if just objects / things joining / coming apart	**(2)** AO 1 1

Question Number	Answer	Mark
(ii)	**D** protons **The only correct answer is D** *A 'beta particles' is incorrect, they are not found in nuclei to facilitate that repulsion* *B 'electrons' is incorrect, for the same reason as A* *C 'neutrons' is incorrect as they don't repel each other*	**(1)** AO 1 1

Q7.

	Answer	Acceptable answers	Mark
(a)(i)	does not emit (ionising) radiation / no (radioactive) decay	it is not radioactive	**(1)**
(a)(ii)	$^{8}_{4}Be$ **B** 5		**(1)**
(a)(iii)	[redacted] $^{8}_{4}Be$ A		**(1)**
(b)(i)	heli um beryllium (1) (1) he lium	daughter in right hand boxes daughter	**(2)**
(b)(ii)	a comparison which describes any **three** of the following: similarities: • produce (more) neutrons (1) • produce 'daughter' (nuclei) (1) • release energy (1) • split a (bigger) nucleus (1) • (triggered by) a neutron coming in (1) • nucleus becomes unstable (before splitting) (1)differences: • uranium daughters are different from each other/ beryllium daughters are the same (1) • uranium daughters are heavier than beryllium daughters (1)	different elements / smaller nuclei for daughters do not accept split an atom neutron is absorbed	**(3)**
(b)(iii)	a description including: neutron(s) (from first fission) (1) (go on to) cause another fission (1)	collide with another nucleus /atom	**(2)**