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

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Name of the Student:_____
Max. Marks : 21 Marks **Time : 21 Minutes**

Mark Schemes

Q1.

Question	Answer	Additional guidance	Mark
(i)	sketch with at least three objects labelled (1) allowed labels: G-M tube counter aluminium piece(s)/sheet(s)/foil (metre) rule β/beta/source aluminium / sheets between source and G-M tube with all three labelled (1)	ignore beta particles / beta drawn as particles or waves	2 AO3.3

Question	Answer	Additional guidance	Mark
(ii)	one from number of pieces/sheets (of aluminium/foil)(1) thickness of aluminium (between source and G-M tube) (1)	allow amount for number	1 AO3.3

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Question	Answer	Additional guidance	Mark
(iii)	**one** from distance between the source and the G-M tube (1) distance between source and aluminium pieces (1) distance between G-M tube and pieces of aluminium (1) activity of source (1) direction / angle of source (1) duration/time of measurement (1)	ignore background radiation / temperature accept beta / beta radiation for source for 1st, 2nd and 4th marking points do not allow 'distance of aluminium' accept (same) strength/intensity of source	**1** **AO3.3**

Question	Answer	Additional guidance	Mark
(iv)	-1 for beta β (1) correctly balanced equation with numbers in boxes adding to 38 (1) $^{90}_{38}Sr \longrightarrow \boxed{-1}\,^{0}\beta + \boxed{39}\,^{90}Y$		**2** **AO1.1**

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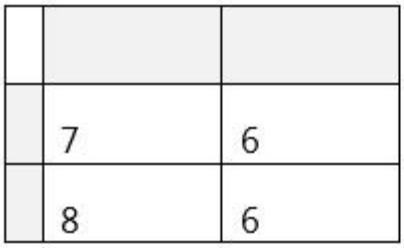
Q2.

Question Number	Answer	Additional guidance	Mark
	 (1) (1)	one mark for each column must have both numbers in a column correct to get the mark	**(2)**

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Q3.

	Answer	Additional guidance	Mark
(i)	A description including: roll / release / drop a marble (down the slope) (1) and **one** from record where the marbles go (1) **OR** measure the angle of path (1)	 allow alpha particle for marble allow any method of recording	**(2)** **AO3**

	Answer	Additional guidance	Mark
(ii)	any **one** from marble / weight has no charge (1) the edge of the paper is not far enough away from the weight (1) the marble / weight is too big / small (1) there is only one marble / weight (1) it is 2 dimensional / not 3D (1) all marbles have the same speed / alpha particles different speed to marbles (1) marbles (only deflect on) hitting / contact with weight (1)	 not to scale allow marble cannot pass through the weight (1)	**(1)** **AO3**

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Q4.

Question number	Answer	Mark
	An answer that combines the following points of understanding to provide a logical description: • the reactor is surrounded by a coolant (1) • the thermal energy release from the chain reaction heats the coolant (1) • the hot coolant is used to generate steam which is used to drive the turbine (1)	**(3)**

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Q5.

Question number	Answer	Additional guidance	Mark
	An answer that provides a description by making reference to: • (energy used to) create steam (1) • steam drives a turbine (1)		**(2)**

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Q6.

Question Number	Answer	Additional guidance	Mark
(i)	a description to include: nebula collapses (1) under **gravity** (1) plus any one from: GPE converted into KE (1) OR (very) **high** temperatures/pressures reached (1)	 allow gas/dust for nebula allow condensing/coming together for collapses allow gravitational force producing (large) increase in **KE** of particles / more (frequent) collisions Ignore references to hot / heat	**(3)**

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Question Number	Answer	Additional guidance	Mark
(ii)	rearrangement **and** substitution (1) (m =) $\frac{3.86 \times 10^{26}}{(3.00 \times 10^{8})^{2}}$ evaluation (1) (m =) 4.29×10^{9} (kg)	 ignore Power Of Ten (POT) error until evaluation allow numbers that round to 4.3×10^{9} (kg) award full marks for the correct answer without working 4.3 to any other power of ten scores 1 mark	**(2)**

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