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

Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Mark Schemes
Q1.

Question Number	Answer	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. **AO3 Strand 2a and 2b (6 marks)** • shows some idea that the data can support arguments about alpha, beta and gamma radiation being present • argues that there is some evidence that alpha might be emitted (count rate going down with paper interposed) • argues that there is a lot of evidence that beta particles are emitted (count rate goes down a lot when the aluminium is inserted) • argues that there might be some gamma getting through (lead stopping everything apart from gamma) OR that with the lead present the count rate has gone down to a level consistent with background, so no gamma was present a level 3 answer will use data effectively	**(6)** AO 1 1

Level	Mark	Descriptor
	0	• No rewardable material.
Level 1	1-2	• Deconstructs scientific information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. • Judgements are supported by limited evidence. (AO3)
Level 2	3-4	• Deconstructs scientific information and provides some logical connections between scientific concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently. • Judgements are supported by evidence occasionally. (AO3)
Level 3	5-6	• Deconstructs scientific information and provide logical connections between scientific concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently. • Judgements are supported by evidence throughout. (AO3)

Q2.

		Indicative Content	Mark
QWC	*	An explanation including some of the following ideas **Need for measurement (N)**Background radiation • is always present/all around us • has (natural) source(s) exemplified by space, living things, rocks, food, nuclear/medical sources etc. • would give false reading in experiment **How and why to measure(H)** Background radiation measurement • is taken at site of experiment **because** it is different in different places	**(6)**

		• is taken with all apparatus **except** source in place • is taken before and after **because** it can change with time / they need an average • must be worked out for same time as (or longer than) experiment / rate found **so** analysis is simpler • It is taken several times/ averaged **because** it is random **Analysis (A)** Background radiation measurement • must be subtracted from measurements with source /main count rate	
Level	**0**	No rewardable content	
1	**1 - 2**	• A limited explanation mentioning any **two** from N or **one** from H or A e.g. Background comes from space and rocks.(N) It is there all the time. (N) OR Readings for background must be repeated because they are random. (H) OR Background must be taken away from all other readings (A) • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy	
2	**3 - 4**	• A simple explanation ***linking*** aspects of two ideas i.e. **N** + **H** OR **N** + **A** OR **H** + **A** e.g Take readings without source (H) and subtract them from the main readings with source present.(A) OR It should be taken several times because it is random (H)so that the average can be subtracted from the main readings (A) • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy	

3	**5 - 6**	• A detailed explanation ***linking*** **A** with EITHER N + an idea from **H** OR two or more ideas from **H** e.g.Background radiation is there all the time. (N) You need to take readings at the place where you will do the experiment and with all the apparatus set up except the source because BR changes from place to place.(H) Then you should subtract background readings from the main experimental readings.(A) OR Take several readings of count rate for averaging since the effect is random (H) and make sure that they are taken in the same place.(H) Then subtract from readings in main experiment.(A) • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors

Q3.

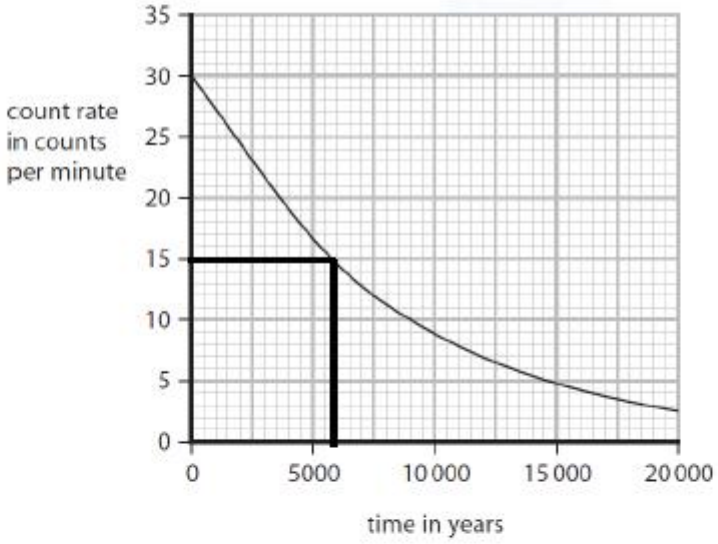
Question number	Answer	Additional guidance	Mark
(i)	an explanation linking any **two** from readings fall (to almost zero) (1) radiation is (all) absorbed (1) after a few cm (of air) (1)	 accept graph / activity / measurements for readings stopped by air in a short distance (in air) reverse arguments must include beta **and** gamma	**2** **AO2.1**

Question number	Answer	Additional guidance	Mark
(ii)	background radiation (1)	or words to that effect accept named examples ignore reference to original alpha source	**1** **AO2.1**

Q4.

Question Number	Answer	Additional guidance	Mark
(i)	6 / six		(1) AO1

Question Number	Answer	Additional guidance	Mark
ii	8 / eight		(1) AO2

Question Number	Answer	Additional guidance	Mark
(iii)	indication of horizontal line between 14 and 16 and / or vertical line between 5250 and 6250 (1)  value between 5250 (years) and 6250 (years) inclusive (1)	accept alternative indications e.g. cross on curve accept any halving pairs e.g. going between 20 cpm and 10 cpm award full marks for the correct answer with no working	(2) AO3