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.

Question number	Answer	Additional guidance	Mark
	An explanation that combines understanding (1 mark) and reasoning (1 mark) linking: • number of neutrons decreases by one (1) • number of protons increases by one.(1)	a neutron becomes a proton plus an electron for (2) marks	**(2)**

Q2.

Question number	Answer	Additional guidance	Mark
	An explanation linking two of a neutron collides with/fired at a (uranium) nucleus (1) releasing (2/3) extra neutron(s) (1) which go on to collide with more nuclei (1)	 neutron absorbed by nucleus. accept atom for nucleus accept atom for nucleus	**(2)**

Q3.

Question number	Indicative content	Mark
	An explanation that combines identification via a judgment (2 marks) to reach a conclusion via justification/reasoning (1 mark): • some alpha particles go straight through (1) • some alpha particles scattered (1) • idea of all mass / (positive) charge concentrated in centre /nucleus (1) • mainly empty space (in rest of atom) (1)	**(3)**

Q4.

Question	Answer	Additional guidance	Mark
	an explanation linking three from use of G-M tube (with counter) (1) no (obvious) radioactive sources present (1) measure (number of) counts in a given time (1) divide number of counts by time (1) repeat readings (1) calculate the average value (1)	 allow Geiger counter / rate meter allow measure count rate / activity if rate meter used take readings in different positions in laboratory	**3 AO3.3**

Q5.

Question	Answer	Additional guidance	Mark
(i)	explanation linking any 3 from:- positrons and electrons annihilate (1) (two) gamma (rays) produced/emitted (1) in opposite directions /at 180° (1) detected by radiation detector/ gamma cameras/scintillation counters (1) at (almost) the same time (1) time difference gives distance difference (1)	 ignore positrons for this marking point allow triangulation	**3 AO2.2**

Question	Answer	Additional guidance	Mark
(ii)	explanation linking any two from must be used a short time after production (1) half-life is short (1)	 must be used while activity is high	**2 AO1.2**
	activity decreases rapidly/decays rapidly (1)	accept decays before use / does not last long	

Q6.

Question number	Answer	Additional guidance	Mark
	An explanation that combines identification – knowledge (1 mark) and reasoning/justification – knowledge (2 marks): • reaction will slow down (1) • because there are fewer fissions (1) • because fission more likely with slow neutrons (1)	allow reactor shuts down/eq fission requires slow neutrons thermal neutrons for slow neutrons	**(3)**