

Multiple Choice Answers

Q30: A

Q32: A

9(a)(i)	most of the atom is empty space
9(a)(ii)	any two from: 1 the nucleus is very small 2 mass of gold nucleus is much greater than mass of alpha particle 3 the nucleus is positively charged
	corresponding explanation to conclusion: 1 not many alpha particles pass close to the nucleus / owtte 2 large force between alpha and nucleus (has bigger effect on small mass of alpha) 3 alpha particles are positively charged, AND force is repulsive
9(b)(i)	(in the nucleus a) neutron is changed into a proton (and an electron which is the emitted β -particle)
9(b)(ii)	22 μg
	(87 years is) three half-lives OR 25 / 8 OR 87 / 29 = 3 (half lives)
	1 / 8th (of the strontium remains) OR 25 / 8 (decays) OR 3.125 seen

Multiple Choice Answers

Q33: D

9(a)(i)	large unstable nucleus OR neutrons hit nucleus OR neutrons are released (from nucleus)
	(large) nucleus splits (into smaller nuclei)
	(large) release of energy
9(a)(ii)	advantage – one from: - Continuous supply of energy - not affected by the weather OR not affected by wind strength - produces large amounts of energy
	disadvantage – one from: - resources finite / not renewable - cost / difficulty of building / cost / difficulty of decommissioning - danger if any leak of radiation - produces hazardous / dangerous waste OR difficulty of storage of used radioactive material OR nuclear waste must be stored for a long time
9(b)	${}^2_1\text{H} + {}^2_1\text{H} \rightarrow {}^3_2\text{He} + {}^1_0\text{n}$
	LHS correct
	${}^3_2\text{He}$ on RHS
	${}^1_0\text{n}$ on RHS