SMART EXAM RESOURCES
9701 CAMBRIDGE AS CHEMISTRY
TOPIC QUESTIONS AND MARK SCHEMES
TOPIC :ATOMIC STRUCTURE
SUB-TOPIC: ISOTOPES
SET-1-QP-MS

1 Gallium is a metal in Group 13 of the Periodic Table.

(a) There are two stable isotopes of gallium, ^{69}Ga and ^{71}Ga.

(i) State, with reference to subatomic particles, how the isotopes ^{69}Ga and ^{71}Ga differ from each other.

.....

..... [1]

MARK SCHEME:

	(different) number of neutrons.	1

2 **(i)** $^{25}_{12}Mg$ is an isotope of magnesium.

Determine the number of protons and neutrons in an atom of $^{25}_{12}Mg$.

number of protons .....

number of neutrons .....

[1]

(ii) State the full electronic configuration of an atom of $^{25}_{12}Mg$.

..... [1]

MARK SCHEME:

)(i)	number of protons: 12 number of neutrons: 13	**1**
(ii)	$1s^2 2s^2 2p^6 3s^2$	**1**

3 State **one** similarity and **one** difference in the properties of these isotopes of magnesium. Explain your answer.

.....

.....

..... [2]

MARK SCHEME:

M1 (magnesium isotopes have) identical chemical properties **AND** same electron(ic) arrangement / configuration **M2** different physical properties **AND** different number of neutrons	**2**

4 Tellurium is an element in Group 16. The most common isotope of tellurium is ^{130}Te. Its electronic configuration is [Kr] $4d^{10}\ 5s^2\ 5p^4$.

(a) Complete Table 1.1.

Table 1.1

	nucleon number	number of neutrons	number of electrons
^{130}Te			

[3]

MARK SCHEME:

(a)		**3**

	nucleon number	number of neutrons	number of electrons
Tellurium-130	130	78	52

5 Atoms with nuclei containing an odd number of protons tend to have fewer isotopes than those with an even number of protons.

(a) Gallium has two stable isotopes, ^{69}Ga and ^{71}Ga.

(i) Complete Table 1.1 to show the numbers of protons, neutrons and electrons in the two stable isotopes of gallium.

Table 1.1

isotope	number of protons	number of neutrons	number of electrons
^{69}Ga			
^{71}Ga			

[2]

MARK SCHEME:

columns 1 & 3 identical **1**

isotope	*No of p's*	*No of n's*	*No of e's*
^{69}Ga	*31*	*38*	*31*
^{71}Ga	*31*	*40*	*31*