Marking scheme for Core Worksheet – Chapter 2

1

		Protons	Neutrons	Electrons	
a	$^{32}_{16}S$	16	16	16	[1]
b	$^{79}_{35}Br$	35	44	35	[1]
c	$^{209}_{83}Bi$	83	126	83	[1]
d	^{51}V	23	28	23	[1]
e	^{195}Pt	78	117	78	[1]
f	^{137}Ba	56	81	56	[1]

2 $^{40}_{20}Ca^{2+}$ [1]

3 False; this would require the mass number to be more than three times the atomic number. The nearest is $^{3}_{1}H$. [1]

4 Different atoms of the same element/same number of protons/same atomic number [1]

but different mass numbers/number of neutrons. [1]

5 **a** $\frac{37.40 \times 185 + 62.60 \times 187}{100}$ [1]

= 186.25 [1]

b $\frac{27.13 \times 142 + 12.18 \times 143 + 23.80 \times 144 + 8.30 \times 145 + 17.19 \times 146 + 5.76 \times 148 + 5.64 \times 150}{100}$ [1]

= 144.33 [1]

6 $\frac{151.96 - 151}{153 - 151} = 0.48$ [1]

48% Eu-153 and 52% Eu-151 [1]

Alternative method:

$\frac{151x + 153(100 - x)}{100} = 151.96$ [1]

$x = 52$ [1]

7	**A**:	ionisation		[1]
		gaseous atoms are bombarded with high energy electrons		[1]
		to produce positive ions		[1]
	B	acceleration		[1]
		in an electric field		[1]
	C	deflection		[1]
		in a magnetic field		[1]
8	**a**	O	2,6	[1]
	b	Si	2,8,4	[1]
	c	Cl	2,8,7	[1]
	d	Na^+	2,8	[1]
	e	Ar	2,8,8	[1]
	f	Ca^{2+}	2,8,8	[1]
	g	F^-	2,8	[1]
	h	N^{3-}	2,8	[1]
	i	K	2,8,8	[1]
	j	S^{2-}	2,8,8	[1]

9 infrared radiation; red light; green light; ultraviolet radiation [2]

[lose one mark for each mistake]

10 an electron is promoted to a higher energy level to form an excited atom [1]

the electron falls down to a lower energy level [1]

excess energy is emitted as a photon of light [1]

11 **a** arrow down to level 3 or 4 [1]

b arrow from level 3 to level 2 [1]

c arrow down to level 1 [1]

12 $H(g) \rightarrow H^+(g) + e^-$ [1]

Lyman series [1]

convergence limit [1]