

## ATOMIC STRUCTURE - 2

1. a) Define the term *mass number*.

\_\_\_\_\_ (1)

- b) What are isotopes?

\_\_\_\_\_  
\_\_\_\_\_ (2)

- c) The element copper has two common isotopes copper-63 and copper-65. The relative atomic mass of copper is 63.5. Explain why the relative atomic mass of copper is 63.5.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ (2)

- d) Write the full isotopic symbol for the isotope which is used as the reference for all relative atomic masses?

\_\_\_\_\_ (2)

- e) Calculate the relative atomic mass of zirconium. Zirconium contains 51.5% zirconium-90, 11.2% zirconium-91, 17.1% zirconium-93, 17.4% zirconium-94 and 2.8% zirconium-96. State your answer to 1 decimal place.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ (3)

2. Make use of a Periodic Table to help in filling in the information about the atoms and ions given in the table.

	No. of protons	No. of neutrons	No. of electrons
$^{137}\text{Ba}$			
$^{207}\text{Pb}^{2+}$			
$^{79}\text{Br}^-$			
$^{87}\text{Rb}^+$			

(4)

3. Use the information presented in the table to answer the questions which follow.

Particle	No. of protons	No. of neutrons	No. of electrons
A	13	14	10
B	14	14	14
C	14	16	14
D	15	16	18
E	16	20	16
F	17	20	18

a) Write the atomic number of the element from Group IV.

\_\_\_\_\_ (1)

b) Write the mass number of the only positive ion in the table.

\_\_\_\_\_ (1)

c) Write the full isotopic symbol of the positive ion in (b)

\_\_\_\_\_ (2)

d) Write the name of the element for which there are two isotopes in the table.

\_\_\_\_\_ (1)

e) Write the full isotopic symbols for each negative ion which appears in the table. Include the ionic charges in the symbols.

\_\_\_\_\_ (4)

4. Write the electronic configurations using orbital notation of the following atoms.

a) a carbon atom

\_\_\_\_\_ (1)

b) a sodium atom

\_\_\_\_\_ (1)

c) an aluminium atom

\_\_\_\_\_ (1)

d) a copper atom

\_\_\_\_\_ (1)

**Total = 27 marks**