

# 1.1 – ATOMIC STRUCTURE – PPQ4



Name ..... Form .....

4) a) Define the terms

i) *mass number* of an atom, .....

.....

ii) *relative molecular mass*. .....

.....

(3)

b) i) Complete the electron arrangement for a copper atom.

$1s^2$ .....

ii) Identify the block in the Periodic Table to which copper belongs. ....

iii) Deduce the number of neutrons in one atom of  $^{65}\text{Cu}$ . .... (3)

c) A sample of copper contains the two isotopes  $^{63}\text{Cu}$  and  $^{65}\text{Cu}$  only. It has a relative atomic mass,  $A_r$ , less than 64. The mass spectrum of this sample shows major peaks with  $m/z$  values of 63 and 65, respectively.

i) Explain why the  $A_r$  of this sample is less than 64.

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ii) Explain how Cu atoms are converted into  $\text{Cu}^+$  ions in a mass spectrometer.

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iii) In addition to the major peaks at  $m/z = 63$  and  $65$ , much smaller peaks at  $m/z = 31.5$  and  $32.5$  are also present in the mass spectrum. Identify the ion responsible for the peak at  $m/z = 31.5$  in the mass spectrum. Explain why your chosen ion has this  $m/z$  value and suggest **one** reason why this peak is very small.

*Identity of the ion* .....

*Explanation for  $m/z$  value* .....

.....

*Reason why this peak is very small* .....

.....

(6)