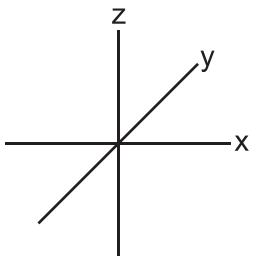
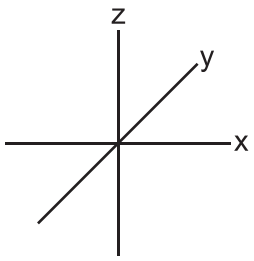
SMART EXAM RESOURCES
9701 CAMBRIDGE AS CHEMISTRY
TOPIC QUESTIONS AND MARK SCHEMES
TOPIC :ATOMIC STRUCTURE
SUB-TOPIC: SHAPE OF ORBITALS
SET-1-QP-MS

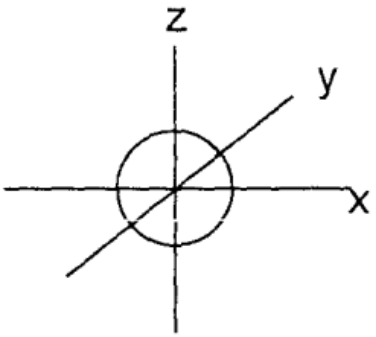
1 On the axes below, draw a sketch diagram of **one** of each **different type (shape)** of orbital that is occupied by the electrons in a second-period element.

Label each type.

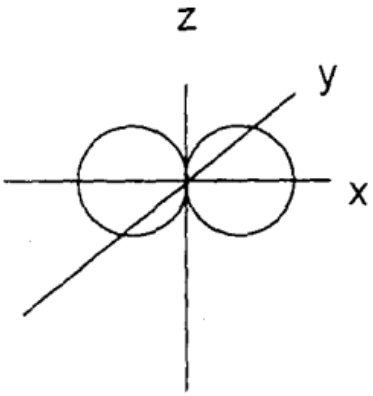




MARK SCHEME:



spherical s orbital (1)

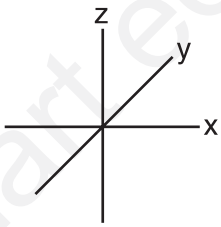


double lobed p orbital along one axis (1)

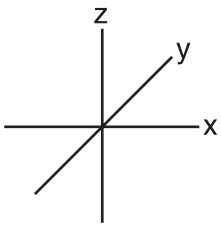
both orbitals correctly labelled (1)

This question is about the bonding of covalent compounds.

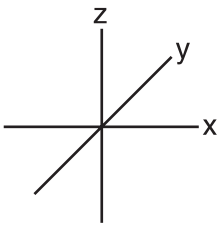
2 **(a)** On the axes below, sketch the shapes of a 1s, a 2s, and a $2p_x$ orbital.



1s



2s

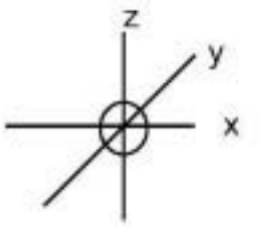


$2p_x$

[3]

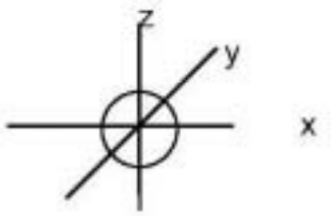
MARK SCHEME:

(a)



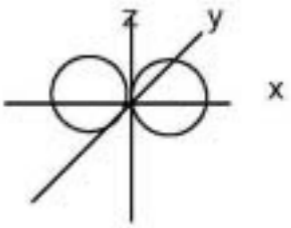
1s

spherical (1)



2s

larger spherical (1)



$2p_x$

double lobes along the *x*-axis (1) [3]

3 In the Periodic Table, the p block contains elements whose outer electrons are found in the p subshell.

(a) Elements in the p block show a general increase in first ionisation energy as the atomic number increases.

(i) Draw the shape of a p orbital.

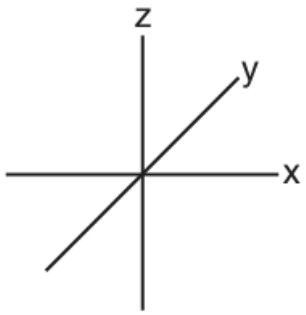
[1]

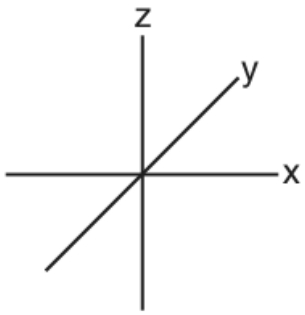
Mark Scheme:

		1

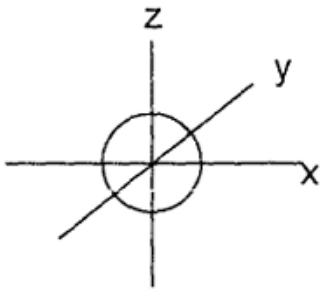
4 On the axes below, draw a sketch diagram of **one** of each **different type (shape)** of orbital that is occupied by the electrons in a second-period element.

Label each type.

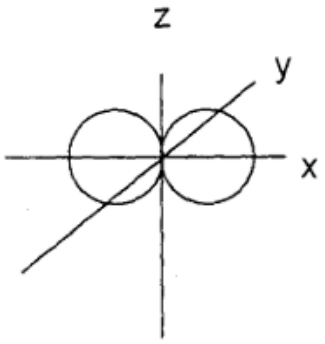




Mark Scheme:



spherical s orbital (1)



double lobed p orbital along one axis (1)

both orbitals correctly labelled (1)