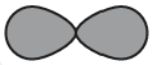
SMART EXAM RESOURCES
9701 AS CHEMISTRY TOPIC QUESTIONS
TOPIC: ATOMIC STRUCTURE
SUB-TOPIC: SUB-SHELLS/SHELLS/ORBITALS/QUANTUM NUMBERS-VOCABULARY
SET-1

1.3.1-Shells-Subshells-Orbitals-and-Principle-Quantum-Number-Set-1-qp-ms

1.

Which atom has its outermost electron in an orbital of the shape shown, with principal quantum number 3?



A sodium

B chlorine

C calcium

D bromine

2.

Which atomic orbitals are occupied in an atom of phosphorus?

A 1p 2s 2p **B** 2s 2p 2d **C** 2s 2p 3s **D** 2p 3s 3d

3.

Which statement about a 3p orbital is correct?

A It can hold a maximum of 6 electrons.

B It has the highest energy of the orbitals with principal quantum number 3.

C It is at a higher energy level than a 3s orbital but has the same shape.

D It is occupied by one electron in an isolated phosphorus atom.

4.

In which pair do both atoms have one electron only in an s orbital in their ground states?

A Ca, Sc **B** Cu, Be **C** H, He **D** Li, Cr

5.

Which element has an equal number of electron pairs and of unpaired electrons within orbitals of principal quantum number 2?

A beryllium

B carbon

C nitrogen

D oxygen

6.

Which statement about the electrons in a ground state carbon atom is correct?

A Electrons are present in four different energy levels.

B There are more electrons in p orbitals than there are in s orbitals.

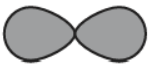
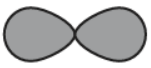
C The occupied orbital of highest energy is spherical.

D The occupied orbital of lowest energy is spherical.

7.

The outermost electron in an atom of neon occupies a particular orbital.

Which row shows the relative energy and shape of this orbital?

	energy of orbital relative to other occupied orbitals	shape of orbital
A	higher or equal	
B	higher or equal	
C	lower or equal	
D	lower or equal	

8.

Which atom has more unpaired electrons than paired electrons in orbitals of principal quantum number 2?

A carbon

B nitrogen

C oxygen

D fluorine

9.

Which molecule contains a nitrogen atom with sp hybridised orbitals?

A $CH_3CH_2NH_2$ **B** HNO_3 **C** HCN **D** NH_3

10.

Which statement about the electrons in a ground state carbon atom is correct?

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11.

Why is the first ionisation energy of oxygen less than that of nitrogen?

A The nitrogen atom has its outer electron in a different subshell.

B The nuclear charge on the oxygen atom is greater than that on the nitrogen atom.

C The oxygen atom has a pair of electrons in one p orbital that repel one another.

D There is more shielding in an oxygen atom.