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VCE Chemistry ½
AOS 1 Revision I [1.12]
Test

30 Marks. 1 Minute Reading. 20 Minutes Writing

### **Results:**

Test Questions	/ 25
Extension	/5





# Section A: Test Questions (25 Marks)

Question	1	(3	marks)	)

Tick whether the following statements are **true** or **false**.

		True	False
a.	Chlorine is typically unstable on its own as it has 7 electrons in the outer shell.		
<b>b.</b>	Noble gases do not react with any other atom since they already have a full valence shell according to the octet rule.		
c.	Hydrogen only has one valence electron, and so needs 7 more electrons in order to become stable.		
d.	First ionisation energy decreases as you move across a period from left to right.		
e.	Electronegativity refers to the ability of an atom to attract electrons towards itself.		
f.	The cesium atom has an effective nuclear charge of +1 whereas the bismuth atom has an effective nuclear charge of +6.		

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Question 2 (7 marks)					
Jay is investigating the structure of atoms to prepare for his first chemistry SAC. To do this, he looks at a single oxygen atom, as presented on the periodic table.					
a.	What are the charges of protons and neutrons? (1 mark)				
b.	According to the Rutherford model, explain the structure of an oxygen atom. (2 marks)				
c.	With reference to the same model, explain why dispersion forces can form. (1 mark)				
d.	How many protons and electrons are expected in a standard <sup>16</sup> O atom? (1 mark)				
e.	After taking a strong interest in the findings of Ernest Rutherford, Jay decides to replicate his famous gold foil experiment. What did this experiment reveal about atoms, and how? (2 marks)				



Question 3 (3 marks)				
Nitrogen and oxygen are two of the most prominent gases which make up around 99% of the total gas volume in the atmosphere. Both molecules are essential to life on Earth and are used for various purposes.				
a. Explain whether oxygen gas and nitrogen gas are polar	a. Explain whether oxygen gas and nitrogen gas are polar. (1 mark)			
<b>b.</b> Oxygen atoms are not found in their single state in na state, such as in O <sub>2</sub> (g). Explain this observation. (2 m	ture and instead are almost always found in a diatomic arks)			
Question 4 (4 marks)				
State the parent and molecular geometry of the following:				
<b>a.</b> CH <sub>4</sub> . (1 mark)				
Parent Geometry Molecular Geometry				
<b>b.</b> HCN. (1 mark)				
Parent Geometry Molecular Geometry				
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Question 6 (3 r	narks)	
Between CO <sub>2</sub> ar	nd C <sub>2</sub> H <sub>6</sub> , predict which one has a higher boiling point and explain your answer.	
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pace for Pers	onal notes	

# Section B: Extension (5 Marks)

#### Question 7 (1 mark)

For an atom of Be, which statement is the MOST correct?

- **A.** The valence electrons will be very difficult to remove as the atomic radius is small, thereby the nucleus will hold onto them strongly.
- **B.** The valence electrons will want to achieve a full outer shell and will gain 6 electrons to do so.
- C. The valence will be very easy to remove as the atomic radius is small, but the nucleus is also very small.
- **D.** The Be atom will want to achieve a full outer shell and will lose 2 electrons to do so.

#### Question 8 (1 mark)

Which of the following molecules have a trigonal planar molecular geometry?

- $\mathbf{A}$ .  $NH_3$
- $\mathbf{B}$ . BeF<sub>2</sub>
- $\mathbf{C}$ .  $\mathbf{BF}_3$
- $\mathbf{D}$ .  $NO_2$

#### Question 9 (1 mark)

Which of the following bonds are considered the least polar?

- **A.** 0 H
- **B.** N-H
- C. H F
- **D.** H Cl

#### **Space for Personal Notes**



#### Question 10 (1 mark)

Which of the following gives the correct shape for each of the molecules listed?

	Linear	V-shaped	Tetrahedral
A.	H <sub>2</sub> O	$\mathrm{NH_3}$	CH <sub>4</sub>
В.	$H_2$	$CO_2$	NH <sub>3</sub>
C.	НЕ	H <sub>2</sub> O	NH <sub>3</sub>
D.	CO <sub>2</sub>	H <sub>2</sub> S	CH <sub>4</sub>

#### Question 11 (1 mark)

An unknown molecule is known to be polar in nature. It contains at least one oxygen atom. All of the following statements about the atom must be true except:

- **A.** The molecule will form dispersion forces with itself.
- **B.** The molecule will form dispersion forces and dipole-dipole attractions with itself.
- C. The molecule will form dispersion forces, dipole-dipole attractions and hydrogen bonding with itself.
- **D.** The molecule has a net dipole.

#### **Space for Personal Notes**



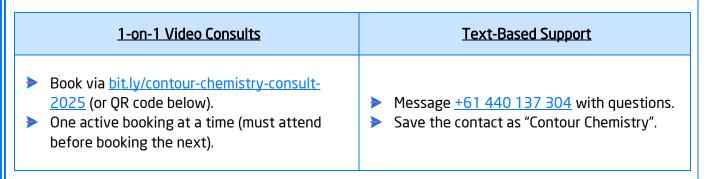
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