



Basic Education
KwaZulu-Natal Department of Basic Education
REPUBLIC OF SOUTH AFRICA

PHYSICAL SCIENCES P2
COMMON TEST
MARCH 2016
MEMORANDUM

NATIONAL SENIOR CERTIFICATE

GRADE 11

MARKS : 50
TIME : 1 Hour

This memorandum consists of 4 pages.

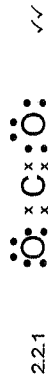
QUESTION 1

- 1.1 B ✓✓ (2)
1.2 C ✓✓ (2)
1.3 A ✓✓ (2) [6]

QUESTION 2

- 2.1.1 molecule made up of 2 same atoms. ✓ (1)
2.1.2 covalent ✓ (1)
2.1.3 As the two atoms approach each other their valence orbitals overlap. ✓
The unpaired valence electrons are shared and attracted to both nuclei holding ✓
the atoms together. When a bond is formed the molecule represents a state of ✓
lower energy. ✓ (3)

- 2.1.4 Ionic bond ✓ (1)
2.1.5 R has a complete outermost shell ✓ with 8 electrons. This makes it a stable ✓
atom. ✓ (2)



- 2.2.2 linear ✓ (1)

- 2.2.3 Symmetrical distribution ✓✓ of charge around the molecule / it is a symmetrical ✓
molecule with polar bonds ✓✓ (2)

- 2.3 valence electrons that are not involved in bonding. ✓✓ (2)

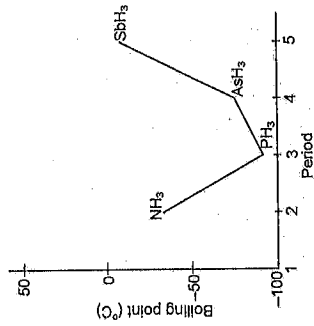
- 2.4 measure of the attractive force a nucleus exerts on a shared electron pair in ✓
a molecule. ✓✓ (2)

- 2.5 energy = 4×415 ✓
= 1660 kJ.mol⁻¹ ✓ (2)

[19]

QUESTION 3

- 3.1.1 Gases ✓
Their boiling points are all below 25°C ✓ (2)
- 3.1.2 Boiling point is a temperature in which the vapour pressure of the liquid equals the atmospheric pressure. ✓ ✓ (2)
- 3.1.3



Criteria for marking	Marks
Correct shape	✓
Correct plotting of points	✓ ✓
Correct labels on axes	✓

- 3.1.4 As period increases boiling points increase ✓ (4)
- 3.1.5 As period increases molecular weight ✓ of the hydrides increase. The strength of the Van der Waals forces increases. ✓ More energy ✓ needed to separate the molecules. (1)
- 3.1.6 The ammonia molecule has hydrogen bonding between its molecules. ✓ Hydrogen bonding is the stronger ✓ than Van der Waals forces. More energy is needed to boil ammonia compared to the other hydrides of group 15. ✓ (3)

- 3.2 Helium atoms come close to each other. ✓
Dipoles are induced ✓ in neighbouring atoms. Forces of attraction between the atoms increase. ✓ Gas becomes liquid. (3)
- 3.3.1 Increases ✓ (1)
- 3.3.2 When a deep body of water cools, the floating ice insulates the liquid below, preventing it from freezing. ✓ This allows life to exist under the frozen water. ✓
- OR Ice has a lower density ✓ than water and can float on water ✓ in frozen rivers. (2)
- 3.4.1 Water requires a large amount of energy to change from liquid to vapour. ✓ ✓ (2)
- 3.4.2 Water will remain as liquid over a greater temperature on Earth and will not evaporate easily. ✓ ✓ (2)

[25]

TOTAL MARKS: [50]