education

Department:
Education
PROVINCE OF KWAZULU-NATAL

PHYSICAL SCIENCES P2
(CHEMISTRY)

COMMON TEST

JUNE 2019

MARKING GUIDELINE

NATIONAL
SENIOR CERTIFICATE

GRADE 10

MARKS: 100

TIME : 2 hours

N.B: This marking guideline consists of 6 pages.

SECTION A

QUESTION 1

1.1 D ✓✓ (2)

1.2 C ✓✓ (2)

1.3 A ✓✓ (2)

1.4 B ✓✓ (2)

1.5 A ✓✓ (2)

1.6 C ✓✓ (2)

1.7 C ✓✓ (2)

[14]

QUESTION 2

2.1

2.1.1 Cooking oil – iron fillings ✓ (1)

2.1.2. Si ✓ (1)

2.1.3. $CuSO_4$, Fe_2O_3 ✓ (Any one of the two) (1)

2.1.4. Fe_2O_3 ✓ (1)

2.1.5. Cl_2 ✓ (1)

2.2.

2.2.1. Homogeneous ✓, water-ethanol form a mixture of uniform composition and all components are in the same phase at room temperature ✓ (2)

2.2.2. Fractional distillation ✓ (1)

2.2.3. Boiling point ✓ (1)

2.2.4. Water ✓ (1)

2.2.5. It mixes completely in all proportions. ✓✓ (2)

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QUESTION 3

3.1. Temperature is the average measure of kinetic energy of molecules. ✓✓ (2)

3.2.1.
- Closely packed. ✓ (Any one property mentioned)
- Irregular shape
- Take shape of the container.

(1)

3.2.2.
- Closely packed. ✓ (Any one property mentioned)
- Regular shape / Rigid shape

(1)

3.3.1. Melting ✓ (1)

3.3.2. Heat energy is absorbed to increase the internal (potential) energy of particles✓ and disturb attractive forces between particles. ✓ (2)

3.4.1. Liquid phase ✓ (1)

3.4.2. Solid phase✓ (1)

3.5. LOWER THAN ✓ (1)

3.6. Substance **Y**✓, melting point and boiling point is 0 and 100 C respectively, which matches water. ✓ (2)

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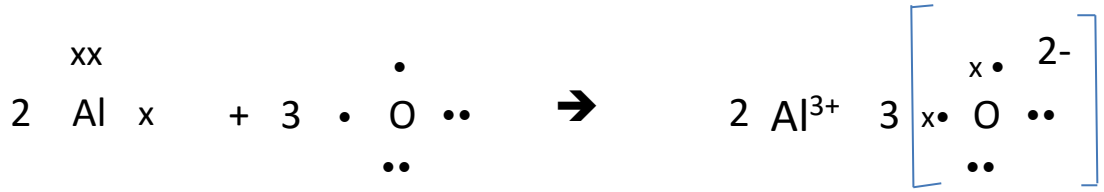
QUESTION 4

4.1.1. Group 5(15) ✓, there are 5 electrons in the outermost orbitals ✓ (2)

4.1.2. Period 3 ✓, the highest energy level is 3 ✓. (2)



Reactants ✓ Products: Ions and Electrons✓ Ratio✓ (3)

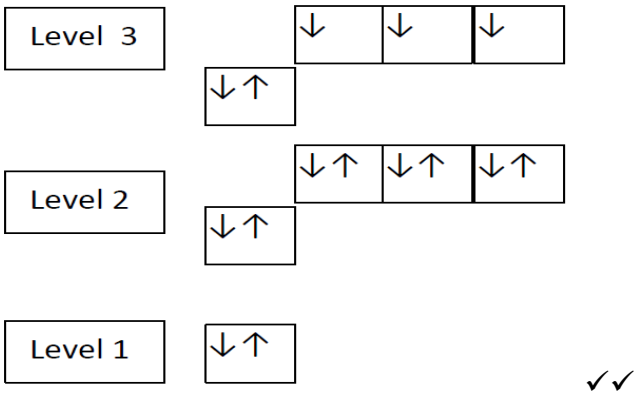
4.3.1. Halogens ✓ (1)

4.3.2. 1 ✓ (1)

4.3.3. 7 electrons ✓ (1)

4.3.4. $Q + 1e^- \rightarrow Q^{-1}$ ✓✓ (2)

4.4.1. (2)



✓✓

4.4.2. Phosphorus ✓ (1)

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QUESTION 5

5.1. Precipitation reaction ✓ (1)

5.2.1. Na_2SO_4 ✓✓ (2)

5.2.2. Na_2CO_3 ✓✓ (2)

5.3.1. Barium sulphate ✓✓ (2)

5.3.2. Barium carbonate ✓✓ (2)

5.4. $BaSO_4$ (s) + $2HNO_3$(aq) → $Ba(NO_3)_2$(aq) + H_2SO_4 (aq) (4)
Reactants ✓ Products ✓ Balance ✓
Correct phases ✓ -

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QUESTION 6

6.1. An electrolyte is the ionic solution that can conduct electricity. ✓✓ (2)

6.2. (Electric) Current. ✓ (1)

6.3. Dissociation is the process in which ionic solids are broken up into ions when dissolved in water ✓✓ (2)

6.4. NaCl (s) → Na^+(aq) + Cl^- (aq) ✓✓ (2)

6.5. Increases ✓ (3)
An increase in concentration increases the number of ions in solution ✓
Thus electrical conductivity increases ✓

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QUESTION 7

7.1.1. B ✓ (1)

7.1.2. A ✓ (1)

7.2.1. Matter cannot be created or destroyed, transforms from one form to another✓✓ (2)

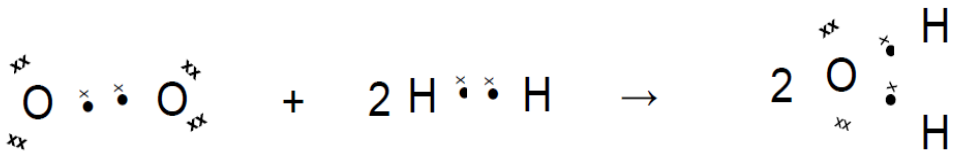
7.2.2. $M_{reactant} = M_{N2} + M_{H2}$ = 14x2 + 1x2x3 = 34 $g.mol^{-1}$✓ (3)

$M_{products} = M_{NH3}$ =14x2 + 1x2x3 = 34 $g.mol^{-1}$✓

(Mass of reactants is equal to the mass of products, therefore) <u>the law is obeyed</u> ✓

7.2.3. Covalent bond ✓ (1)

7.3. (3)



Reactants ✓ Products ✓ balance ✓

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QUESTION 8

8.1.1. Energy needed per mole to remove an electron from an atom in a gaseous phase. ✓✓ (2)

8.1.2. Increases ✓ (1)

8.1.3. As one moves from 1st to 3rd ionization energy (2)
Electrons occupy the lower energy levels which increases the effective force of attraction between nucleus and electrons, thus more energy is required to remove electrons✓✓

8.1.4. As one moves down the group ✓,First ionization energy decreases✓ (2)
Or
As one moves up the group ✓,First ionization energy increases✓

8.2.1. Isotopes are atoms of the same element having the same number of protons, but different numbers of neutrons. (2)

8.2.2. (4)

$$\text{R.A.M} = \frac{M^{24}_{Mg} \times \%\text{ abundance}}{100\%} + \frac{M^{25}_{Mg} \times \%\text{ abundance}}{100\%} + \frac{M^{26}_{Mg} \times \%\text{ abundance}}{100\%}$$

$$= \frac{23{,}985 \times 78{,}99\%\checkmark}{100\%} + \frac{24{,}959 \times 10\%\checkmark}{100\%} + \frac{25{,}983 \times 11{,}01\%\checkmark}{100\%}$$

$$= 24{,}30\ g.mol^{-1}\checkmark$$

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TOTAL MARKS: [100]