PHYSICAL SCIENCES

NATIONAL SENIOR CERTIFICATE

GRADE 10
FORMAL TEST NO 1
MEMORANDUM
20 MARCH 2015

MARKS : 100 **DURATION 1H30min**

This MEMORANDUM consists of FOUR pages including this one

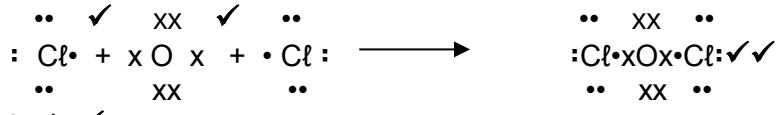
QUESTION 1

1.1 D✓✓
1.2 C✓✓
1.3 D✓✓ (2)
1.4. A✓✓ (2)
1.5 B✓✓
1.6 C✓✓ (2)

[12]

QUESTION 2

2.1
2.1.1 Oxygen /O✓ (1)
2.1.2 Chlorine/Cℓ✓ (1)
2.2
2.2.1 7✓ (1)
2.2.2 2✓ (1)
2.3 Non-metal✓ (1)
2.4 1✓ (1)
2.5 Covalent bond✓ (1)
2.6 (5)



2.7 Ionic ✓ (1)
2.8 **ANY TWO** (2)
- High melting point✓
- Conducts electricity in molten state✓
- Dissolves easily in water✓

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QUESTION 3

3.1
3.1.1 Potassium bromide✓ (1)
3.1.2 19,35✓ (1)
3.13 Copper(II)carbonate✓ (1)
3.1.4 $CuCO_3$ ✓ (1)
3.1.5 SO_2✓ (1)
3.1.6 16,(8)2✓ (1)
3.2.
3.2.1 Atoms with the same number of protons and electrons✓ but different number of neutrons✓ (2)
3.2.2 Chemical properties are determined by the electronic structure✓ of a substance. Isotopes have the same electronic structure✓ and thus the same chemical properties. (2)
3.2.3 $Ar = \left[50 \times \frac{43}{100}\right] + \left[52 \times \frac{83,8}{100}\right] + \left[53 \times \frac{9,5}{100}\right] + \left[54 \times \frac{2,4}{100}\right]$ ✓ (2)

= 52,06✓ (Accept 52,057)

3.2.4 Cr/Chromium✓ (1)

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QUESTION 4

4.1
4.1.1 What is the relationship between phase and temperature of a substance✓ (2)
4.1.2 Temperature✓ (1)
4.1.3 Phase change✓ (1)

4.1.4 **ANY TWO** (2)
- Keep mass of powder being heated constant. ✓
- Use the same powder each time she runs the experiment✓
- Start the experiment each time with water at room temperature in the water bath. ✓

4.2 Repeat the experiment at least three times and take the average readings. ✓✓ (2)

4.3 The temperature at which the (saturation) vapour pressure of a liquid equals the atmospheric (ambient) pressure. (2)

4.4

4.4.1 55°C✓ (1)

4.4.2 95°C✓ (1)

4.5

4.5.1 A✓ (1)

4.5.2 D✓ (1)

4.5.3 C✓ (1)

4.5.4 B✓ (1)

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QUESTION 5

5.1

5.1.1 His friend at b hears two blows because sound travels faster in a steel than in air. ✓ He hears the first pulse that travels through the steel and the sound pulse that travels through the air✓ (3)

5.1.2 $v = \frac{d}{t}$ ✓ (3)

$t = \frac{d}{v} = \frac{100}{5000}$ ✓ = 0,02 s✓

5.2

5.2.1 Longitudinal wave✓ (1)

5.2.2 A (compression) and B (rarefaction) ✓ (2)

5.2.3 Disagree. ✓ Air particles do not move from a vibrating object to a person's ears. Air particles in the air keep more or less fixed positions as the wave reaches them and they transfer energy to the next particles✓✓ (3)

[12]

QUESTION 6

6.1

6.1.1 Wavelength is the distance between two points which are exactly in phase. Distance between two successive crests/successive troughs✓✓ (2)

6.1.2

6.1.2.1. $\lambda = \frac{0,180}{12}$ ✓✓= 0,015 m✓ (3)

6.1.2.2. $v = f \times \lambda$ ✓ (3)

$f = \frac{v}{\lambda} = \frac{0,225}{0,015}$ ✓ = 15Hz✓

6.2

6.2.1 Upwards ✓ (1)

6.2.2 P and Q✓ (1)

6.2.3

6.2.3.1. $f = \frac{1}{T}$ ✓ $= \frac{1}{0,3}$ = 3,33 Hz✓ (2)

6.2.3.2. $v = f \times \lambda$✓ (3)

$\lambda = \frac{v}{f} = \frac{12}{3,33}$ ✓ = 3,6 m✓

6.2.4 Amplitude is the maximum displacement of a particle (of a medium) from the equilibrium position. ✓✓ (2)

6.2.5 30 mm = 0,3 m✓✓ (2)

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QUESTION 7

7.1 Acceleration of charged particles. (1)

7.2

7.2.1 Gamma rays✓ (1)

7.2.3 microwaves✓ (1)

7.3 **ANY ONE** (2)

- That have different speeds (3 x 10^8 m·s^{-1}) or ✓✓
- electromagnetic waves travel through a vacuum but not sound waves or✓✓
- Electromagnetic waves are transverse waves and sound is longitudinal. ✓✓

7.4 E = hf ✓ = 6,63 x 10^{-34} x 100 x 10^6 ✓ = 6,63 x 10^{-28} J✓ (3)

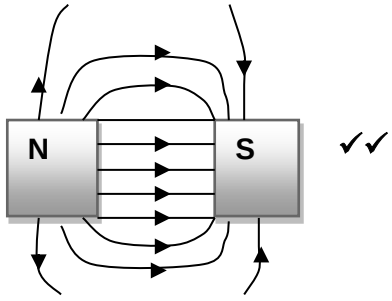
[8]

QUESTION 8

8.1 A magnetic compass (1)

8.2 A magnetic field is a region in space surrounding a magnet in which another magnet or ferromagnetic substance will experience a force. (1)

8.3 (2)



✓✓

8.4 closer✓ (1)

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TOTAL = 100 MARKS