

**GAUTENG DEPARTMENT OF EDUCATION  
GAUTENGSE DEPARTEMENT VAN ONDERWYS  
SENIOR CERTIFICATE EXAMINATION  
SENIORSERTIFIKAAT-EKSAMEN**

**FUNCTIONAL PHYSICAL SCIENCE SG  
FUNKSIONELE NATUUR- EN SKEIKUNDE SG  
(Second Paper: Chemistry) /  
(Tweede Vraestel: Chemie)**

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**POSSIBLE ANSWERS / MOONTLIKE ANTWOORDE SUPP 2007**

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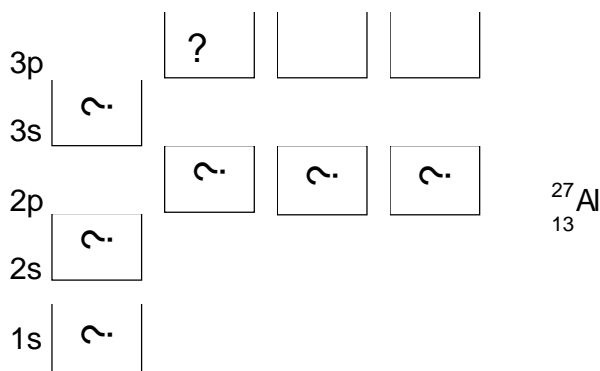
**QUESTION 1 / VRAAG 1**

1.1 A	1.6 A	1.11 D
1.2 A	1.7 B	1.12 A
1.3 B	1.8 D	1.13 C
1.4 B	1.9 B	1.14 D
1.5 B	1.10 C	1.15 C

15x3=[45]

**QUESTION 2 / VRAAG 2**

2.1  
2.1.1

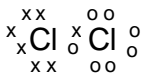


(4)

- 2.1.2 Boron / *Boor* (2)
- 2.1.3 Similar chemical properties.  
*Soortgelyke chemiese eienskappe.* (2)
- 2.1.4 Both increases. / *Albei vermeerder.* (2)
- 2.1.5 14 neutrons / *neutrone* (2)
- 2.1.6 Periodic table is arranged according to increasing atomic numbers. /  
*Periodieke tabel is gerangskik in toenemende atoomgetal.* (2)
- 2.2  
2.2.1 1<sup>st</sup> energy level. / *1<sup>ste</sup> energievlak.* (2)

- 2.2.2 An electron is readily removed from the atom to form a cation.  
? Elektron word maklik verwyder uit die atoom om ? kation te vorm. (2)
- 2.2.3 Energy. / Energie. (2)
- 2.2.4 Positive ion (cation). / Positiewe ioon (kation) (2)
- 2.2.5 An anion and a cation will be formed which attract one another. The formation of an ionic bond. / ? Anioon en ? kation sal vorm wat mekaar gaan aantrek. Vorming van ? ioniese binding. (2)
- [24]**

### QUESTION 3 / VRAAG 3

- 3.1
- 3.1.1  (2)
- 3.1.2 Covalent bond. / Kovalente binding. (2)
- 3.1.3 P-orbitals / P-orbitale (2)
- 3.2 Ionic / Ionies (2)
- 3.3
- 3.3.1  $\text{Mg} + \text{O}_2 \rightarrow \text{MgO} + \text{energy}$  /  $\text{Mg} + \text{O}_2 \rightarrow \text{MgO} + \text{energie}$  (2)
- [12]**

### QUESTION 4 / VRAAG 4

- 4.1
- 4.1.1 Water (2)
- 4.1.2 Hydrogen bonds. / Waterstofbindings. (2)
- 4.1.3 Van der Waals forces. / Van der Waals-kragte. (2)
- 4.1.4 Ether. / Eter. (2)
- 4.2 The forces amongst water molecules and sodium chloride are of the same strength, that is why it dissolves easier in water than in alcohol. Strong hydrogen bonds in water and strong Coulomb forces in NaCl. / Die kragte tussen water en natriumchloried-kristalle is van vergelykbare grootte. Daarom los dit makliker op in water as in alkohol. Sterk waterstofbindings by water en sterk Coulombkragte by NaCl. (4)
- [12]**

**QUESTION 5 / VRAAG 5**

- 5.1 Endothermic / *Endotermies* (2)
- 5.2
- 5.2.1 Exothermic / *Eksotermies* (2)
- 5.2.2 Heat of reaction ( $\Delta H$ ) / *Reaksiewarmte ( $\Delta H$ )*. (2)
- 5.2.3 Activation energy. / *Aktiveringsenergie*. (2)
- [8]**

**QUESTION 6 / VRAAG 6**

- 6.1
- 6.1.1 Forward and reverse reactions occur at the same rate /  
*Voorwaartse en terugwaartse reaksies vind teen dieselfde tempo plaas.* (4)
- 6.1.2 When pressure is applied the equilibrium shifts towards the left and the colour of mixture becomes lighter. Conversely if the pressure is reduced, colour become darker – indication that equilibrium shifts towards the right.  
*As die druk verhoog, skuif die ewewig na links en die kleur van die mengsel word ligter. Omgekeerd indien die druk verminder, word die mengsel donkerder, wat aandui dat ewewig na regs verskuif.* (2)
- 6.1.3 The mixture becomes darker ( $\text{NO}_2$  is brown). The equilibrium shifts towards the right. /  
*Die oplossing word donkerder ( $\text{NO}_2$  is bruin). Die ewewig skuif na regs.* (4)
- [10]**

**QUESTION 7 / VRAAG 7**

- 7.1 When the atom donates an electron. /  
*As die atoom ? elektron afgee.* (2)
- 7.2
- 7.2.1 Zn. (2)
- 7.2.2  $\text{H}^+$  is reduced (receives an electron)  
 *$\text{H}^+$  is gereduseer (ontvang ? elektron)* (2)
- 7.2.3 Hydrochloric acid / *Soutsuur* (1)
- [7]**

**QUESTION 8 / VRAAG 8**

- 8.1
- 8.1.1 Lead / *Lood* (2)
- 8.1.2 Oxidation / *oksidasie* (2)
- 8.1.3 To provide free ions. / *Om vry ione te verskaf.* (2)

- 8.1.4  $\text{Pb}^{2+} + 2\text{e}^- \rightarrow \text{Pb}$  (2)
- 8.2
- 8.2.1 Zinc / Sink (2)
- 8.2.2 Zinc / Sink (2)
- [12]

### QUESTION 9 / VRAAG 9

- 9.1
- 9.1.1 Lithium burns with a bright red flame. / *Litium brand met ? helder rooi vlam.* (2)
- 9.1.2 Lithium oxide. / *Litiumoksied.* (2)
- 9.1.3  $4\text{Li} + \text{O}_2 \rightarrow 2\text{Li}_2\text{O}$  (4)
- 9.2 Alkali metals. / *Alkalimetale.* (2)
- [10]

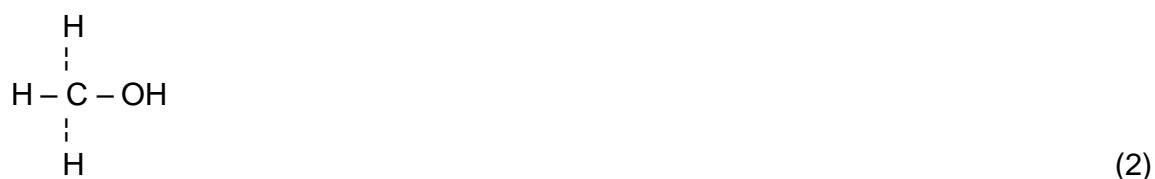
### QUESTION 10 / VRAAG 10

- 10.1 An alkane in which one or more hydrogen atoms have been substituted by a halogen atom.  
? *Alkaan waarin een of meer waterstofatome deur ? halogeenatoom vervang is.* (2)

10.2



10.2.2



10.2.3



10.2.4



TOTAL / TOTAAL: 150