Grade 10 – Nov 2012 Paper 2 Chemistry Model Answers

Question 1

1) C
2) D
3) B
4) A
5) A
6) A
7) B
8) C
9) A
10) B

Question 2

1) First ionisation energy
2) Covalent bonding
3) Ion
4) Liquid
5) Mole

Question 3

a) Pure
b) Mixture
c) Pure
d) Mixture
e) Pure
f)

i. 4 ii. 8 iii. 8 iv. 9

g)

i.	$ZnBr_2$	vi.	H_2SO_4	xi.	$AlPO_4$
ii.	$AlBr_3$	vii.	$ZnSO_4$	xii.	H_2O
iii.	HNO_3	viii.	$Al_2(SO_4)_3$	xiv.	Al_2O_3
iv.	$Zn(NO_3)_2$	ix.	H_3PO_4		
v.	$Al(NO_3)_3$	x.	$Zn_3(PO_4)_2$		

Question 4

a) BC or DE
b) Phase change
c) Liquid phase

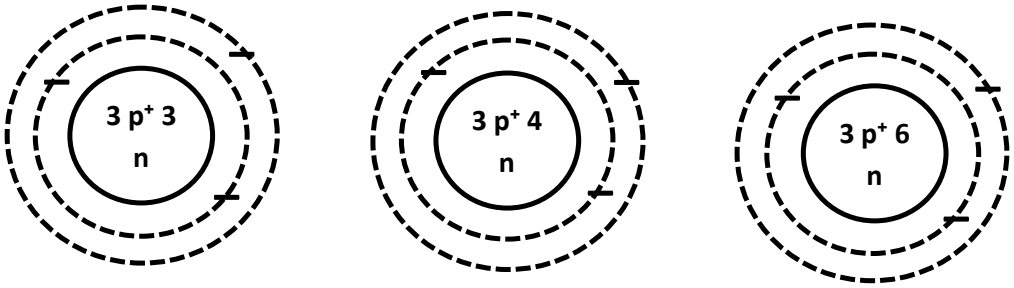
Question 5

a) An isotope is an atom with the same atomic number, but different mass number.

Or

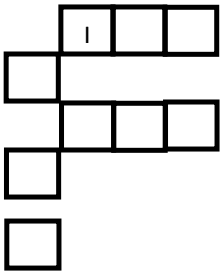
An isotope is an atom with same number of protons, but a different number of neutrons.

b)



Question 6

a)



b) 3rd energy level

c) Period 3

d) 3 valence electrons

e) Group 3

f) Al^{3+}

g) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^1$

Question 7

a) Group II or 2
b) Group VII or 17
c) Group VIII or 18 or 0
d) Group I or 1

Question 8

a) Sodium Nitrate
b) Magnesium phosphate
c) Ammonium Sulphite
d) Potassium Permanganate
e) $Al_2(SO_3)_3$
f) $Fe(NO_3)$

Question 9

a) Covalent bonding:
1 or more atoms bond together by sharing 1 or more pairs of valence electrons.

b) Ionic bonding:
It is the transfer of 1 or more electrons from metal to non-metal atoms.

Question 10

a) Empirical Formula indicates the simplest whole number ratio of atoms that a compound consists of.

b)

Composition	Percentage	Grams per 100g	No. of moles	Ratio
Carbon C	92.2%	92.2g	$n = \frac{m}{M}$ $= \frac{92.2}{12}$ $= 7.692$	$\frac{7.692}{7.692} = 1{,}00$
Hydrogen H	7.7%	7.7g	$n = \frac{m}{M}$ $= \frac{7.7}{1}$ $= 7.7$	$\frac{7.7}{7.692} = 1{,}001$

Styrene Empirical Formula = $\mathbf{C_1H_1}$

Question 11

a) $n = \frac{m}{M}$
$m = n \times M$
$m = 2{,}5 \times 18$
$m = \mathbf{45\ g\ of\ H_2O}$

$M_{H_2O} = (1)2 + 16 = 18\ g.mol^{-1}$

b) $n = \frac{m}{M}$
$n = \frac{4}{32}$
$n = 0{,}125\ mol\ of\ O_2$

$M_{O_2} = (16)2 = 32\ g.mol^{-1}$

$$n = \frac{V}{V_o}$$

$$V = n \times V_o = 0{,}125 \times 22{,}4 = \mathbf{2{,}8\ dm^3}$$

c)

NH_3	NO	
4 mol	4 mol	Balanced equation
2 mol	$x =$ 2 mol	Given

$$n = \frac{m}{M}$$

$$m = n \times M$$

$$m = 2{,}0 \times 30$$

$$m = \mathbf{60\ g\ of\ NO}$$

$$M_{NO} = 14 + 16 = 30\ g.mol^{-1}$$

Question 12

$$M_{Cu(NO_3)_2} = 63{,}5 + 2[14 + 3(16)] = 187{,}5\ g.mol^{-1}$$

$$\%\ Cu: \frac{63{,}5}{187{,}5} \times 100\% = \mathbf{33{,}87\%}$$

$$\%\ N: \frac{(14)2}{187{,}5} \times 100\% = \mathbf{14{,}93\%}$$

$$\%\ O: \frac{(16 \times 3)2}{187{,}5} \times 100\% = \mathbf{51.2\%}$$