

**YEAR 10 SCIENCE**  
**Chemistry Test - 2011**

Name: \_\_\_\_\_

Teacher: \_\_\_\_\_

Mark: \_\_\_\_\_

**41/40**

Part 1: Multiple Choice – Write your correct answer in the table.

**KEY**

1. Which of the following are all **transition metals**?

- (a) Li, Mn, Ca ✓
- ☒ (b) Mn, Fe, Cu
- (c) F, Cl, Br ✗
- (d) Na, K, Fe ✗

2. Which of the following are all **alkali metals**?

- ☒ (a) Li, Na, K
- (b) Mg, Ca, Na
- (c) He, Ne, Ar
- (d) Cu, F, Mn

3. Which of the following are **noble gases**?

- ☒ (a) Ne, Ar, He
- (b) He, N, H
- (c) O, H, Ar
- (d) O, He, Ne

4. The **valence electrons** are:

- (a) the number of total electrons an atom has.
- ☒ (b) the number of electrons in the atom's outer shell.
- (c) the number of electrons an atom has after it reacts.
- (d) the number of electrons an atom has before it reacts.

5. The mass number of an element is how many \_\_\_\_\_ there are one atom.

- (a) protons
- (b) electrons
- (c) neutrons
- ☒ (d) protons + neutrons

**MULTIPLE  
CHOICE  
ANSWERS**

1	<b>b</b>
2	<b>a</b>
3	<b>a</b>
4	<b>b</b>
5	<b>d</b>
Marks	<b>/5</b>

## Part 2: Short Answer

1. Explain how covalent bonding works.

- covalent bonds form between non-metals (0.5)
- electrons are shared. (0.5)

(1 mark)

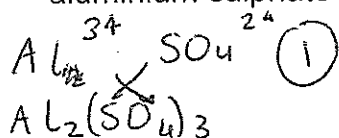
2. Explain how ionic bonding works.

- ionic bonding between oppositely charged ions. (0.5)
- electrons are lost or taken (0.5)

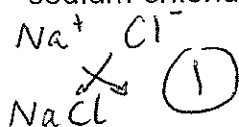
(1 mark)

3. Write the chemical formulae for the following.

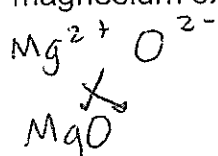
(a) aluminium sulphate



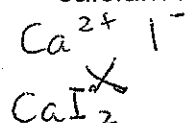
(c) sodium chloride



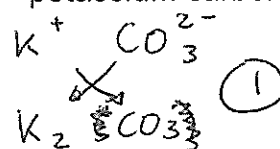
(e) magnesium oxide



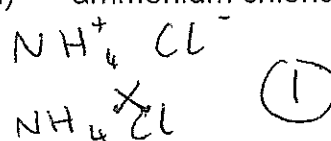
(g) calcium iodide



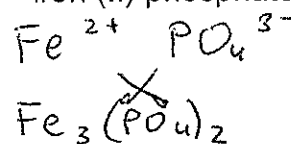
(b) potassium carbonate



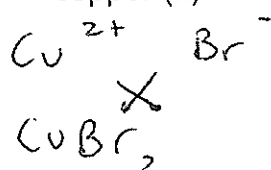
(d) ammonium chloride



(f) iron (II) phosphate



(h) copper (II) bromide



(8 marks)

4. Fill in the missing words.

Metal properties	Non-metal properties
They are <u>malleable</u> , this means they can be hammered into sheets. They are also <u>ductile</u> , which means they can be stretched into wires.	They are <u>brittle</u> . This means that they will shatter when hammered.
Are <u>solid</u> at room temperature. <u>Mercury</u> is the only metal to be a liquid at room temperature.	Some are liquids, some are <u>gases</u> and some are solids at room temperature.
Can conduct <u>electricity</u> .	Cannot conduct <u>electricity</u> (except for carbon)
Are found on the <u>left</u> hand side of the periodic table.	Are found on the <u>right</u> hand side of the periodic table.

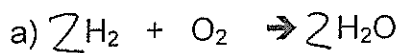
(5 marks)

5. Fill in the table below.

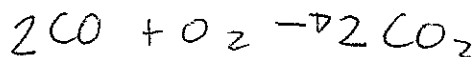
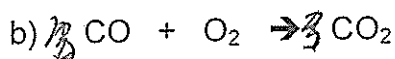
(12 marks)

Name of element	Symbol	Atomic number	Mass number	Number of protons	Number of electrons	Number of neutrons	Electron configuration diagram
Neon	Ne	10	<del>20.18</del> 20.18 20 round up	10	10	10	
Carbon	C	6	12.01 12	6	6	6	
Oxygen	O	8	16 16	8	8	8	

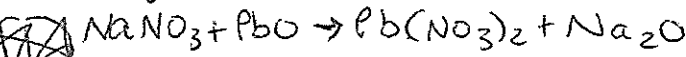
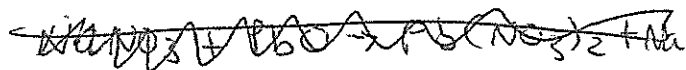
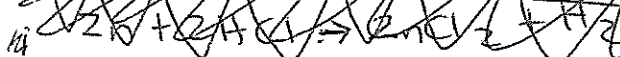
6. Balance the following equations:



(1)



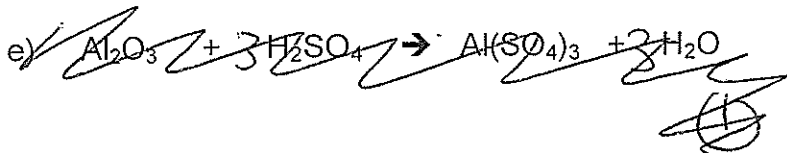
(1)



(1)



(1)

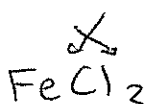
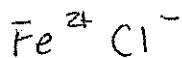
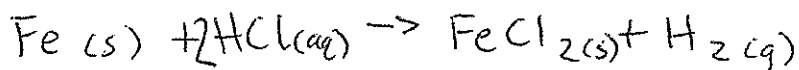


(5 marks)

4

7. Write **balanced chemical equations** for the following reactions.

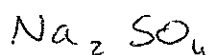
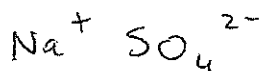
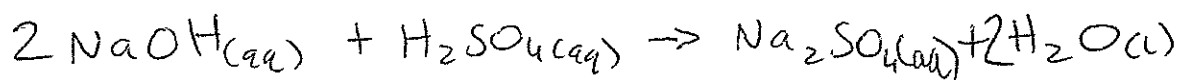
(a) Iron metal reacts with hydrochloric acid to produce iron(II)chloride and hydrogen gas.



(1) equation

(1) balanced correctly

(b) Sodium hydroxide and sulphuric acid react to produce sodium sulphate and water.



don't need these

(1) equation

(1) balanced correctly (4 marks)

# Group I Group II

Alternative Group numbers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Period 1	H 1 hydrogen 1.008	He 2 helium 4.003																
Period 2	Li 3 lithium 6.941	Be 4 beryllium 9.012											B 5 boron 10.81	C 6 carbon 12.01	N 7 nitrogen 14.01	O 8 oxygen 16.00	F 9 fluorine 19.00	Ne 10 neon 20.28
Period 3	Na 11 sodium 22.99	Mg 12 magnesium 24.30											Al 13 aluminium 26.99	Si 14 silicon 28.09	P 15 phosphorus 30.97	S 16 sulfur 32.07	Cl 17 chlorine 35.45	Ar 18 argon 39.95
Period 4	K 19 potassium 39.10	Ca 20 calcium 40.08	Sc 21 scandium 44.96	Ti 22 titanium 47.88	V 23 vanadium 50.94	Cr 24 chromium 52.00	Mn 25 manganese 54.85	Fe 26 iron 55.85	Co 27 cobalt 58.93	Ni 28 nickel 58.69	Cu 29 copper 63.55	Zn 30 zinc 65.39	Ga 31 gallium 69.72	Ge 32 germanium 72.61	As 33 arsenic 74.92	Se 34 selenium 78.96	Br 35 bromine 79.90	Kr 36 krypton 83.80
Period 5	Rb 37 rubidium 85.47	Sr 38 strontium 87.62	Y 39 yttrium 88.91	Zr 40 zirconium 91.22	Nb 41 niobium 92.91	Mo 42 molybdenum 95.94	Tc 43 technetium (98)	Ru 44 ruthenium 101.1	Rh 45 rhodium 102.9	Pd 46 palladium 106.4	Ag 47 silver 107.9	Cd 48 cadmium 112.4	In 49 indium 114.8	Sn 50 tin 118.7	Sb 51 antimony 121.8	Te 52 tellurium 127.6	I 53 iodine 126.9	Xe 54 xenon 131.3
Period 6	Cs 55 caesium 132.9	Ba 56 barium 137.3	*La 57 lanthanum 138.9	Hf 72 hafnium 178.5	Ta 73 tantalum 180.9	W 74 tungsten 183.89	Re 75 rhenium 186.2	Os 76 osmium 190.2	Ir 77 iridium 192.2	Pt 78 platinum 195.1	Au 79 gold 197.0	Hg 80 mercury 200.6	Tl 81 thallium 204.4	Pb 82 lead 207.2	Bi 83 bismuth 209.0	Po 84 polonium (209)	At 85 astatine (210)	Rn 86 radon (222)
Period 7	Fr 87 francium (223)	Ra 88 radium 226	*Ac 89 actinium (227)	Rf 104 rutherfordium (261)	Db 105 dubnium (262)	Sg 106 seaborgium (266)	Bh 107 bohrium (264)	Hs 108 hassium (277)	Mt 109 meitnerium (268)	Ds 110 darmstadtium (271)	Rg 111 roentgenium (272)							

# Group III Group IV Group V Group VI Group VII Group VIII

*Lanthanides series	Ce 58 cerium 140.1	Pr 59 praseodymium 140.9	Nd 60 neodymium 144.2	Pm 61 promethium (145)	Sm 62 samarium 150.4	Eu 63 europium 152.0	Gd 64 gadolinium 157.2	Tb 65 terbium 158.9	Dy 66 dysprosium 162.5	Ho 67 holmium 164.9	Er 68 erbium 167.3	Tm 69 thulium 168.9	Yb 70 ytterbium 173.0	Lu 71 lutetium 175.0
*Actinides series	Th 90 thorium 232.0	Pa 91 protactinium 231.0	U 92 uranium 238.0	Np 93 neptunium 237	Pu 94 plutonium (244)	Am 95 americium (243)	Cm 96 curium (247)	Bk 97 berkelium (247)	Cf 98 californium (251)	Es 99 einsteinium (252)	Fm 100 fermium 257	Md 101 mendelevium (258)	Nobelium 102 (259)	Lr 103 lawrencium (260)

A relative atomic mass in brackets is the mass number of the isotope with longest half life.

Fig 1 The periodic table

+1 charge	-1 charge
lithium, $\text{Li}^+$ sodium, $\text{Na}^+$ potassium, $\text{K}^+$ copper (I) or cuprous, $\text{Cu}^+$ silver, $\text{Ag}^+$	fluoride, $\text{F}^-$ chloride, $\text{Cl}^-$ bromide, $\text{Br}^-$ iodide, $\text{I}^-$ hydride, $\text{H}^-$
ammonium, $\text{NH}_4^+$ hydrogen, $\text{H}_{(\text{aq})}^+$	hydroxide, $\text{OH}^-$ nitrite, $\text{NO}_2^-$ nitrate, $\text{NO}_3^-$ acetate, $\text{CH}_3\text{COO}^-$ hydrogencarbonate or bicarbonate $\text{HCO}_3^-$ hydrogensulfate or bisulfate, $\text{HSO}_4^-$ chlorate, $\text{ClO}_3^-$
+2 charge	-2 charge
manganese $\text{Mn}^{2+}$ magnesium, $\text{Mg}^{2+}$ calcium, $\text{Ca}^{2+}$ barium, $\text{Ba}^{2+}$ zinc, $\text{Zn}^{2+}$ copper (II) or cupric, $\text{Cu}^{2+}$ mercury (II) or mercuric, $\text{Hg}^{2+}$ iron (II) or ferrous, $\text{Fe}^{2+}$ tin (II) or stannous, $\text{Sn}^{2+}$ lead (II) or plumbous, $\text{Pb}^{2+}$ nickel(II), $\text{Ni}^{2+}$	oxide, $\text{O}^{2-}$ sulfide, $\text{S}^{2-}$
	carbonate, $\text{CO}_3^{2-}$ sulfate, $\text{SO}_4^{2-}$ sulfite, $\text{SO}_3^{2-}$

+3 charge	-3 charge
aluminium, $\text{Al}^{3+}$ iron (III) or ferric, $\text{Fe}^{3+}$ chromium, $\text{Cr}^{3+}$	nitride, $\text{N}^{3-}$
	phosphate, $\text{PO}_4^{3-}$
+4 charge	
tin (IV) or stannic, $\text{Sn}^{4+}$ lead (IV) or plumbic, $\text{Pb}^{4+}$	