EXAMINATIONS COUNCIL OF SWAZILAND
Swaziland General Certificate of Secondary Education

PHYSICAL SCIENCE **6888/02**

Paper 2 **October/November 2018**

Confidential

MARK SCHEME

{6888/02}

MARKS: 80

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1 **(a)** they all have two energy levels; they have 2 (electron) shells, same no of (electron) shells [1]

(b) **(i)** oxygen; [1]

(ii) lithium, beryllium; [1]

(c) magnesium (atoms) loses (two) outermost electrons; magnesium atoms loses valence electrons [1]

Each flouride (atom) gains an electron; each of the (2) atoms gains / attract 2 electrons oppositely enlarged ions [1]

(d) a lot of energy (heat) needed; to break / overcome R: High Temperature [1]

(strong) sigma covalent bonds (within the layers of graphene); [1]

2 **(a)** distance covered per unit time; / speed; rate of change of displacement; [1]

in a specified direction; [1]

(b) 4 – 6.4 sec; reject **CD** [1]

(c) **OC**: steady contact uniform acceleration; / velocity increases uniformly [1]

Air is larger than air resistance / resistance is negligible), only weight acts on the ball; OWTTE A : downward > upward [1]

DE: uniform speed velocity; / zero acceleration; terminal velocity; [1]

Air resistance has increased to equal the weight/ no net force; / no resultant (no weight and air resistance balance). [1]

(d) 50; (soi) [1]

k.e. = ½ m v^2 or k.e = ½ x 0.1 x 50^2; [1]

125 J ; [1]

3 **(a)** 207 + 2(14) + 6 (16) or 207 + 28 + 96; A : A1 Pb + 2ArN + 6 x ArO [1]

331; [1]

(b) **(i)** 1 mol / dm^3 = $\frac{n}{0.5\,dm^3}$; 1dm^3 : 1mol

A: 1 x 500cm^3 0.5dm^3 : *x* [1]

0.5 mol; *x* = 0.5 mol [1]

(ii) N = nL or 0.5 × 6.02 × 10^{23};soi (ecf) [1]

= 3.01 × 10^{23} ; A ratio [1]

1 mol : 6.02 x 10^{23}

0.5 mol : *x*

(c) 0.5 mol × 461; ecf [1]

230.5 g ; [1]

OR

331 : 461

165.5 : x

$x = \frac{165.5 \times 461}{331}$;

mole ratio : $Pb(NO_3) : PbI_2$

1 : 1

0.5 : 0.5

$\frac{m}{461} = 0.5$ m PbI2 = 0.5 x 461 = 230.5g

x = 230.5g; A : 231g

4 **(a)** **(i)** gases ↓ liquid ↓ solids; [1]

explanation: gases have weakest intermolecular forces;

liquids have stronger intermolecular forces than gases;

and solids have the strongest intermolecular forces; [2]

(ii) cracking of glass (when hot water is poured onto it) / cracking of walls,

Cracking of floors of buildings / bending of railway lines / bursting of water pipes; [1]

accept other relevant responses; bending of bimetallic strip when breaking contact / separating contact

(b) **(i)** bimetallic strip (expands and) bends downwards; bends away from contact [1]

and circuit breaks; / opens gap in the circuit / cuts flow of current. [1]

(ii) (thermo) emf / potential difference(across junctions); [1]

(iii) size / amount / deflection / change in/ mercury length / volume potential difference; change in thermometric property [1]

per unit change (rise / drop) in temperature; [1]

5 **(a)** silver chloride / silver bromide / silver iodide / silver fluoride; [1]

(b) **(i)** changes grass to black / becomes darker; [1]

(ii) reduction; [1]

(c) A : Acts as a catalyst it speeds up the reaction; / activates the reaction / provides energy for the reaction to take place [1]

(d) (overall) energy taken-in absorbed in bond breaking is more needed / required [1]

than energy released given out during bond formation;

6 **(a)** **(i)** **Z**, wavelength increased/larger; /
Z wave moves faster in deep water (than in shallow water); [1]

(ii) stay the same;/ remains constant / does not change [1]

(b) **(i)** circular waves after gap; [1]

wavelength after gap same as wavelength before gap; [1]

(ii) v = fλ or 5 = 2 x λ; [1]

λ = 2.5 cm; [1]

(c) $n = \frac{\sin i}{\sin r}$ OR $\frac{\sin 42}{\sin 34}$; = n [1]

1.2; [1]

7 **(a)** A : chalco pyrites copper pyrites; [1]

(b) (open cast) mining / (underground shaft & panning) mining; ALLUVIAL MINING [1]

(c) **(i)** new substance is formed / gas evolved /colour change ; [1]

(ii) basic oxide; / base [1]

(d) use: electrical cables / electricity cables / electrical wiring / cooking utensils / manufacture of brass; water pipes / plating [1]

explanation: good conductor of electricity / good conductor of heat / (stronger and more) resistant to corrosion; [1]

8 **(a)** 5 x 9 = 45 V; [1]

(b) W = mg or w = 40 x 10; [1]

400 N; [1]

(c) **(i)** p.e = mgh or p.e = 40 x 10 x 4; [1]

1600 J; [1]

(ii) P = E/t or P = 1600/5; (ecf) [1]

320 W; / 320J / S [1]

9 **(a)** **(i)** crude oil / petroleum / coal A : sulfur containing compounds

(fossil) fuels (such as coal) which contain sulfur undergo burning combustion;

smelting of sulphur ores / decomposition of sulfates [1]

(ii) sulfur dioxide forms acid rain; / sulphurous acid / sulfuric acid [1]

sulfurous acid rain corrodes buildings; / A damage / destroy [1]

(b) increased carbon dioxide concentration in the atmosphere; / more CO_2
Higher %, [1]

Holds / traps heat((IR) radiation) <u>from the earth</u>; [1]

(c) glucose + oxygen ⟶ carbondiaoxide + water + energy;
$C_t H_{12} O_6 + 6O_2 \longrightarrow 6CO_2 + 6H2O$ +(ENERGY)
glucose reacts with oxygen
oxidation of glucose; [1]

10 **(a)** coil cuts the magnetic field (produced by the poles of the magnet);/ moves across

moles perpendicular [1]

current voltage emf is induced (in the coil) (and current flows); [1]

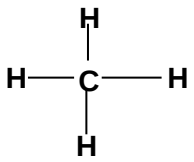
(b) less emf <u>induced</u>;/ current / voltage / P.D. [1]

(c) sound to electrical; sound ⟶ (KINETIC) ⟶ ELECTRICAL;;

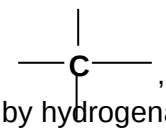
[2

(d) generator; [1]

11 **(a)**



correct structure; [1]

(b) they have the same functional group 

, i.e., single bonds between carbon atom s/ saturated they are prepared by hydrogenation of alkenes
they have <u>similar</u> methods of preparation/they have <u>similar</u> chemical they are generally unreactive

properties(substitution / combustion) / consecutive members differ by a CH_2
they have same name coding – ane

(group) / all members conform to a general formula, (C_nH_{2n+2});
gradual change in physical properties (as n = carbon atoms change) [1]

(c) catalyst: aluminium oxide;/ ZEOLITE / Aluminium oxide + silicon dioxide S_iO_2
Al_2O_3 [1]

temperature;400 °C – 600 °C;/ 400º C - 500º C / 400º C - 550º C [1]

(d) **(i)** High pressure 10 - 15 ATM
ethene; [1]

(ii) oxygen reacts with ethanol; bacteria in the air oxidises ethanol; atmosphere bacteria oxidises ethanol.
ethanol is oxidised [1]

to ethanoic acid (which is sour);
acetic acid
[1]