



EXAMINATIONS COUNCIL OF ESWATINI  
Eswatini General Certificate of Secondary Education

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**PHYSICAL SCIENCE**

**6888/01**

Paper 1 Short Answers

**October/November 2022**

**1 hour**

Candidates answer on the Question Paper.

No Additional Materials are required.

**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name in the spaces provided.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams, graphs, tables or rough working.

Do **not** use staples, paper clips, highlighters, glue or correction fluid.

Do **not** write on the barcode.

Answer **all** questions.

You may use an electronic calculator.

A copy of the Periodic Table is printed on page 9.

You may lose marks if you do not show your working or if you do not use appropriate units.

The number of marks is given in brackets [ ] at the end of each question or part question.

**For Examiner's Use**

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This document consists of **9** printed pages and **3** blank pages.

- 1 Which statement does **not** describe electromagnetic waves?

Circle the correct letter.

- A They are all transverse in nature.  
 B They can be reflected and refracted.  
 C They all travel at the same speed of 330 m/s in a vacuum.  
 D They transfer energy from one place to another.

[1]

- 2 The distillation apparatus in Fig. 2.1 is used to obtain water from aqueous copper(II) sulfate.

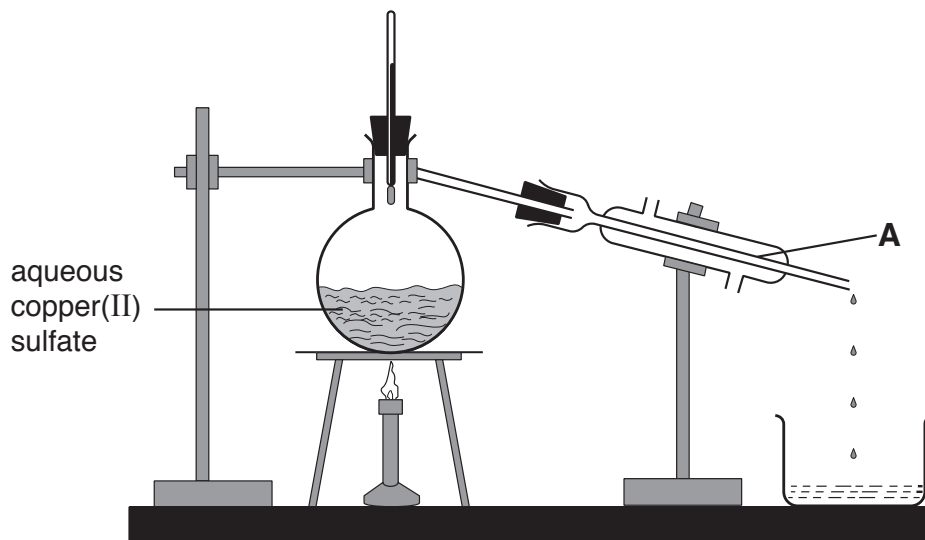


Fig. 2.1

- (a) Name the substance found in **A** during the distillation process.

..... [1]

- (b) Name the **two** processes that are used to obtain the water from the aqueous copper(II) sulfate in Fig. 2.1.

1 .....

2 ..... [2]

- 3 A car engine uses petrol as fuel.

State the energy changes that occur in a car engine.

..... [2]

- 4 Table 4.1 shows the electronic arrangement of four atoms.

**Table 4.1**

atom	electronic arrangement
<b>B</b>	2,6
<b>C</b>	2,8
<b>D</b>	2,8,7
<b>E</b>	2,8,6

- (a) State the letter **B**, **C**, **D** or **E**, of the atom of an unreactive element.

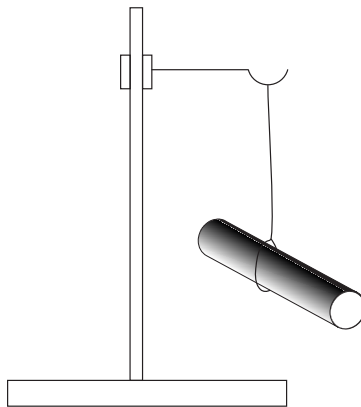
..... [1]

- (b) Use the Periodic Table on page 9 to give the name of an element that is in the same group as **D** but more reactive than **D**.

..... [1]

- 5 Fig. 5.1 shows a polythene rod suspended with a thin thread.

The rod is rubbed with a dry-cloth.



**Fig. 5.1**

State and explain what happens when another polythene rod that has been rubbed with the same dry cloth is brought close to the suspended rod.

.....  
 ..... [2]

6 Fig. 6.1 shows a substance that has changed from state **F** to state **G**.



**Fig. 6.1**

Describe the difference in

**(a)** the movement of particles in state **F** and in state **G**.

.....  
.....  
..... [2]

**(b)** the forces of attraction between the particles of the substance in state **F** and in state **G**.

.....  
..... [1]

7 A body moving along a circular path has a constant speed, but its velocity changes.

Explain why the velocity of the body changes.

.....  
..... [1]

8 Draw a 'dot and cross' diagram to show the bonding in a chlorine molecule,  $Cl_2$ .

Show only the outermost electrons.

[2]

9 A uniform metre rule is supported at its centre mark and balanced by two weights, 4 N and 5 N, as shown in Fig. 9.1.

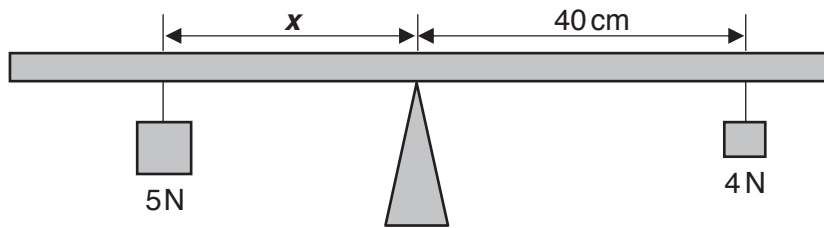


Fig. 9.1

Calculate the length,  $x$ , that will balance the metre rule.

..... cm [2]

- 10 Fig 10.1 shows the apparatus used in the electrolysis of molten copper(II) chloride using carbon electrodes.

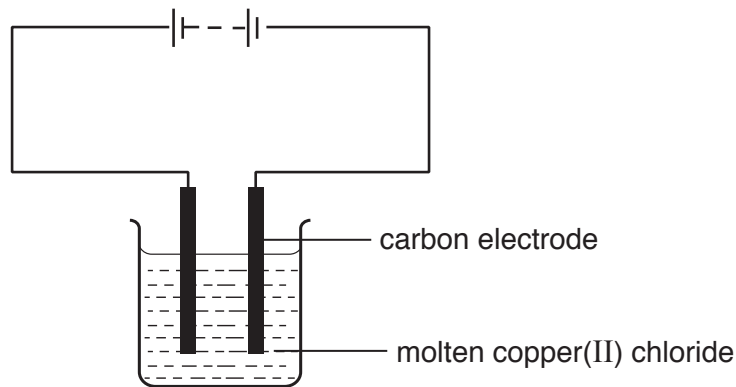


Fig. 10.1

- (a) State the name of the electrode where copper metal is formed.

..... [1]

- (b) Describe how copper metal is formed on this electrode.

.....  
 ..... [2]

- 11 A thermometer is sensitive to temperature changes.

Name **two** features that can make a thermometer more sensitive.

1 .....

2 ..... [2]

- 12 Ammonia is used in the manufacture of fertilisers.

Describe the test for ammonia gas.

test .....

result ..... [2]

- 13 Explain why sound cannot travel through a vacuum.

.....  
 ..... [1]

14 Carbon dioxide contributes to global warming.

(a) State the main source of the carbon dioxide that contributes to global warming.  
..... [1]

(b) State **one** adverse effect of global warming.  
..... [1]

15 Fig. 15.1 shows a ray of light striking a smooth surface.

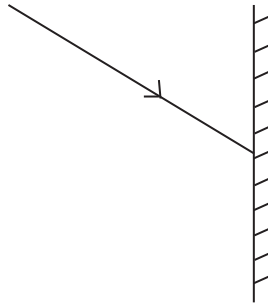


Fig. 15.1

Complete Fig. 15.1 by constructing the path of the ray after striking the surface. [3]

16 Iron is extracted from iron ore.

Describe the role of carbon in the extraction of iron.  
.....  
.....  
.....  
..... [3]

17 Zama adds some weights at one end of a suspended spring and finds the extension each time.

Fig. 17.1 shows the extension-load graph of the spring.

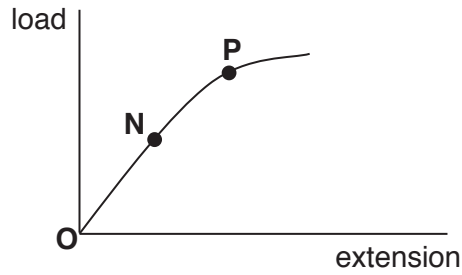


Fig. 17.1

(a) State the term used for the point labelled P.

..... [1]

(b) Describe the extension-load relationship between the points O and N in Fig. 17.1.

.....  
..... [1]

(c) Describe the effect of the load on the spring, beyond the point P in Fig.17.1.

.....  
..... [1]

18 Describe how fluorescent lamps produce light.

.....  
.....  
.....  
..... [3]



## DATA SHEET The Periodic Table of the Elements

		Group																			
I	II											III	IV	V	VI	VII	0				
7 <b>Li</b> Lithium	9 <b>Be</b> Beryllium											1 <b>H</b> Hydrogen	11 <b>B</b> Boron	12 <b>C</b> Carbon	14 <b>N</b> Nitrogen	16 <b>O</b> Oxygen	19 <b>F</b> Fluorine	20 <b>Ne</b> Neon			
3 <b>Li</b>	4 <b>Be</b>	23 <b>Na</b> Sodium	24 <b>Mg</b> Magnesium	11 <b>Na</b>	12 <b>Mg</b>											5 <b>B</b>	6 <b>C</b>	7 <b>N</b>	8 <b>O</b>	9 <b>F</b>	10 <b>Ne</b>
39 <b>K</b> Potassium	40 <b>Ca</b> Calcium	45 <b>Sc</b> Scandium	48 <b>Ti</b> Titanium	51 <b>V</b> Vanadium	52 <b>Cr</b> Chromium	55 <b>Mn</b> Manganese	56 <b>Fe</b> Iron	59 <b>Co</b> Cobalt	59 <b>Ni</b> Nickel	64 <b>Cu</b> Copper	65 <b>Zn</b> Zinc	70 <b>Ga</b> Gallium	73 <b>Ge</b> Germanium	75 <b>As</b> Arsenic	79 <b>Se</b> Selenium	80 <b>Br</b> Bromine	84 <b>Kr</b> Krypton				
19 <b>K</b>	20 <b>Ca</b>	21 <b>Sc</b>	22 <b>Ti</b>	23 <b>V</b>	24 <b>Cr</b>	25 <b>Mn</b>	26 <b>Fe</b>	27 <b>Co</b>	28 <b>Ni</b>	29 <b>Cu</b>	30 <b>Zn</b>	31 <b>Ga</b>	32 <b>Ge</b>	33 <b>As</b>	34 <b>Se</b>	35 <b>Br</b>	36 <b>Kr</b>				
85 <b>Rb</b> Rubidium	88 <b>Sr</b> Strontium	89 <b>Y</b> Yttrium	91 <b>Zr</b> Zirconium	93 <b>Nb</b> Niobium	96 <b>Mo</b> Molybdenum	98 <b>Tc</b> Technetium	101 <b>Ru</b> Ruthenium	103 <b>Rh</b> Rhodium	106 <b>Pd</b> Palladium	108 <b>Ag</b> Silver	112 <b>Cd</b> Cadmium	115 <b>In</b> Indium	119 <b>Sn</b> Tin	122 <b>Sb</b> Antimony	128 <b>Te</b> Tellurium	127 <b>I</b> Iodine	131 <b>Xe</b> Xenon				
37 <b>Rb</b>	38 <b>Sr</b>	39 <b>Y</b>	40 <b>Zr</b>	41 <b>Nb</b>	42 <b>Mo</b>	43 <b>Tc</b>	44 <b>Ru</b>	45 <b>Rh</b>	46 <b>Pd</b>	47 <b>Ag</b>	48 <b>Cd</b>	49 <b>In</b>	50 <b>Sn</b>	51 <b>Sb</b>	52 <b>Te</b>	53 <b>I</b>	54 <b>Xe</b>				
133 <b>Cs</b> Caesium	137 <b>Ba</b> Barium	139 <b>La</b> Lanthanum	178 <b>Hf</b> Hafnium	181 <b>Ta</b> Tantalum	184 <b>W</b> Tungsten	186 <b>Re</b> Rhenium	190 <b>Os</b> Osmium	192 <b>Ir</b> Iridium	195 <b>Pt</b> Platinum	197 <b>Au</b> Gold	201 <b>Hg</b> Mercury	204 <b>Tl</b> Thallium	207 <b>Pb</b> Lead	209 <b>Bi</b> Bismuth	209 <b>Po</b> Polonium	210 <b>At</b> Astatine	222 <b>Rn</b> Radon				
55 <b>Cs</b>	56 <b>Ba</b>	57 <b>La</b>	72 <b>Hf</b>	73 <b>Ta</b>	74 <b>W</b>	75 <b>Re</b>	76 <b>Os</b>	77 <b>Ir</b>	78 <b>Pt</b>	79 <b>Au</b>	80 <b>Hg</b>	81 <b>Tl</b>	82 <b>Pb</b>	83 <b>Bi</b>	84 <b>Po</b>	85 <b>At</b>	86 <b>Rn</b>				
223 <b>Fr</b> Francium	226 <b>Ra</b> Radium	227 <b>Ac</b> Actinium	†																		
87 <b>Fr</b>	88 <b>Ra</b>	89 <b>Ac</b>	†																		

\* 58–71 Lanthanoid series  
† 90–103 Actinoid series

**Key**

	a
	X

a = relative atomic mass  
X = atomic symbol  
b = atomic (proton) number

140 <b>Ce</b> Cerium	141 <b>Pr</b> Praseodymium	144 <b>Nd</b> Neodymium	147 <b>Pm</b> Promethium	150 <b>Sm</b> Samarium	152 <b>Eu</b> Europium	157 <b>Gd</b> Gadolinium	159 <b>Tb</b> Terbium	163 <b>Dy</b> Dysprosium	165 <b>Ho</b> Holmium	167 <b>Er</b> Erbium	169 <b>Tm</b> Thulium	173 <b>Yb</b> Ytterbium	175 <b>Lu</b> Lutetium
58 <b>Ce</b>	59 <b>Pr</b>	60 <b>Nd</b>	61 <b>Pm</b>	62 <b>Sm</b>	63 <b>Eu</b>	64 <b>Gd</b>	65 <b>Tb</b>	66 <b>Dy</b>	67 <b>Ho</b>	68 <b>Er</b>	69 <b>Tm</b>	70 <b>Yb</b>	71 <b>Lu</b>
90 <b>Th</b> Thorium	91 <b>Pa</b> Protactinium	92 <b>U</b> Uranium	93 <b>Np</b> Neptunium	94 <b>Pu</b> Plutonium	95 <b>Am</b> Americium	96 <b>Cm</b> Curium	97 <b>Bk</b> Berkelium	98 <b>Cf</b> Californium	99 <b>Es</b> Einsteinium	100 <b>Fm</b> Fermium	101 <b>Md</b> Mendelevium	102 <b>No</b> Nobelium	103 <b>Lr</b> Lawrencium

The volume of one mole of any gas is 24 dm<sup>3</sup> at room temperature and pressure (r.t.p.).





