EXAMINATIONS COUNCIL OF ESWATINI
Eswatini General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

PHYSICAL SCIENCE **6888/01**

Paper 1 Short Answers **October/November 2023**

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

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

The number of marks is given in brackets [ ] at the end of each question or part question.
The total number of marks is 40.

For Examiner's Use

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

1 Table 1.1 shows a unit and symbol of a quantity.

Complete Table 1.1 by filling in the correct quantity.

Table 1.1

quantity	unit	symbol
	kilogram	kg

[1]

2 Sodium-25 is an isotope of sodium.

This isotope can be represented with the symbol $^{25}_{11}Na$.

Complete Table 2.1 by writing the number of sub-atomic particles in an ion of sodium-25, $^{25}_{11}Na^{+}$.

Table 2.1

sodium-25	$^{25}_{11}Na^{+}$
protons	
neutrons	
electrons	

[3]

3 The Sun is a source of solar energy.

Explain how the Sun produces solar energy.

.....

.....

.....

..... [3]

4 Calcium is an element.
Water is a compound.

Describe the difference between an element and a compound.

Use calcium and water as examples.

.....

.....

..... [2]

5 Fig. 5.1 shows a parallel circuit. All the bulbs in the circuit are identical.

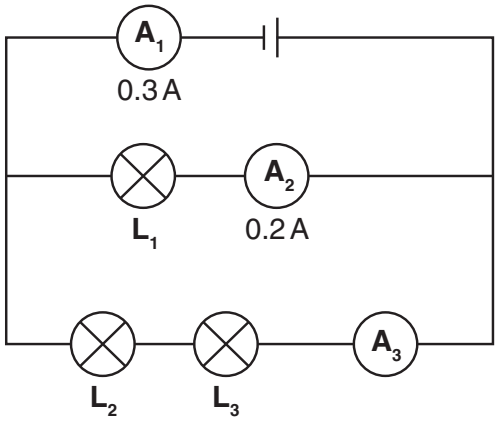

Fig. 5.1

(a) State the reading on ammeter A_3.

..... [1]

(b) State the effect on lamps L_1 and L_2 if lamp L_3 breaks.

L_1 ..... [1]

L_2 ..... [1]

6 The boiling point of bronze is 2300 °C.

A sample of bronze was found to boil at 2350 °C.

State a reason for this observation.

.....

..... [1]

7 Fig. 7.1 shows a rectangular coil between the poles of a U-magnet.

The ends of the coil are connected to a battery through split rings and carbon brushes.

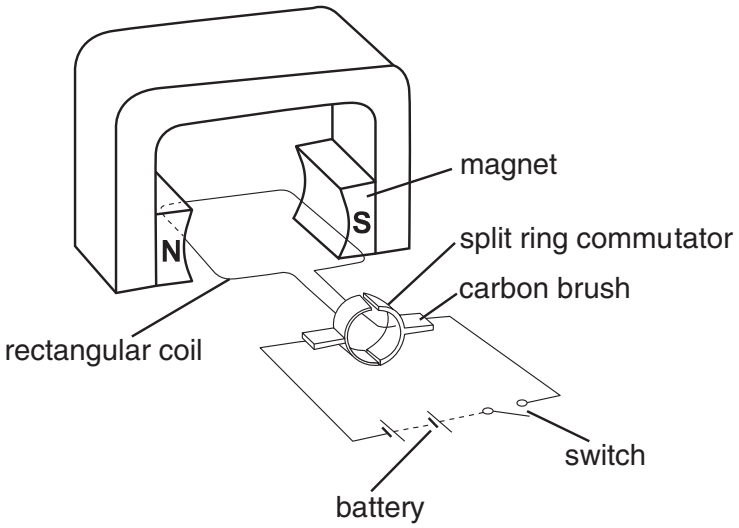

Fig. 7.1

Describe what happens when the switch is closed.

.....

.....

.....

..... [3]

8 The formula for ethanol is CH_3CH_2OH.

Complete Fig. 8.1 by drawing a dot-and-cross diagram for ethanol. [3]

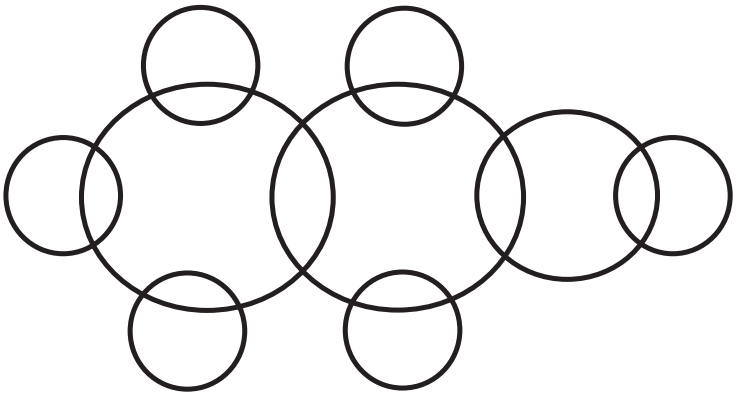

Fig. 8.1

9 Fig. 9.1 shows a load-extension graph for a spring.

The initial length of the spring is 3 cm.

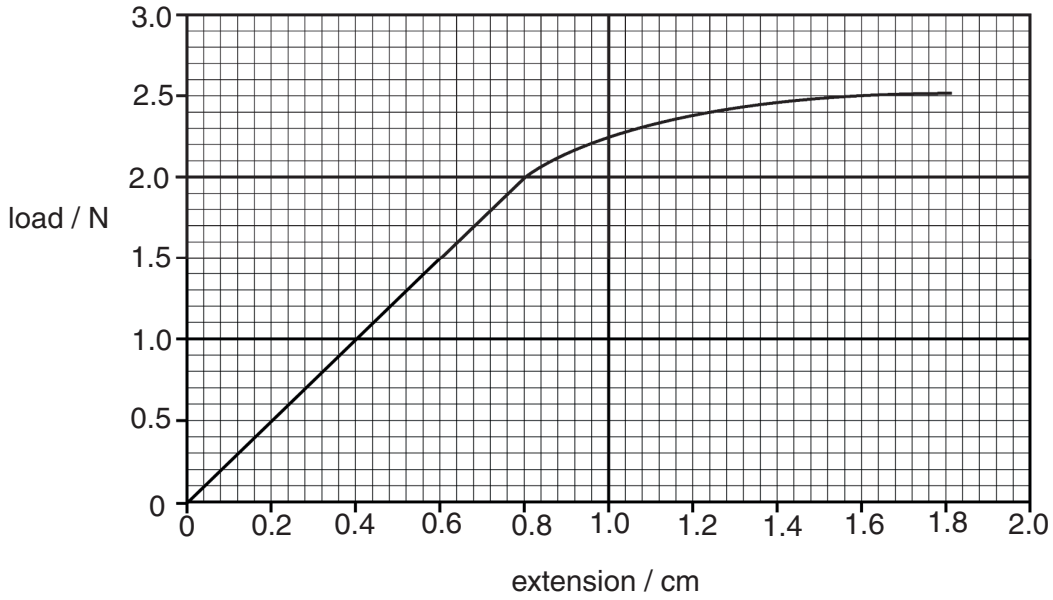

Fig. 9.1

(a) Mark with a cross (**X**), on Fig. 9.1, the limit of proportionality of the spring. [1]

(b) Determine the length of the spring when the load is 1.5 N.

length ..... cm [2]

10 Fig. 10.1 shows the apparatus used to prepare carbon dioxide gas and calcium chloride in the school laboratory.

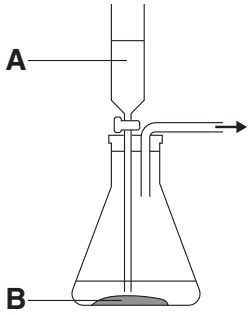

Fig. 10.1

(a) Identify reactants **A** and **B**.

A ..... [1]

B ..... [1]

(b) Complete Fig. 10.1 to show how the gas can be collected in the laboratory. [2]

11 Fig. 11.1 shows a p-n junction between two types of semi-conductors.

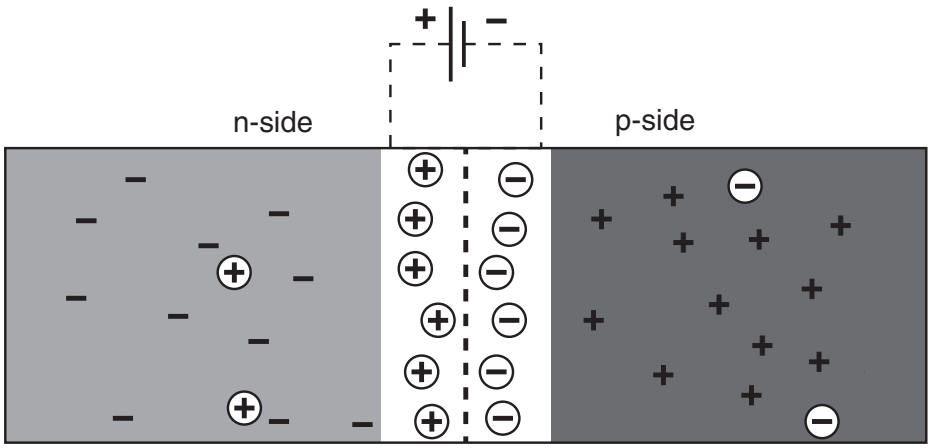

Fig. 11.1

(a) Name **one** example of a semi-conductor material.

..... [1]

(b) Describe the main feature of the p-side and the n-side in a p-n junction shown in Fig. 11.1.

.....

.....

.....

.....

..... [2]

12 Molten copper(II) chloride and aqueous copper(II) chloride can both be decomposed via electrolysis.

Identify the ions in molten copper(II) chloride and aqueous copper(II) chloride.

molten copper(II) chloride .....

.....

aqueous copper(II) chloride.....

..... [2]

13 Fig. 13.1 shows a step-down transformer.

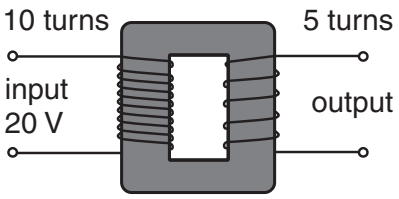

Fig. 13.1

Calculate the voltage in the secondary (output) coil.

Voltage = ... V [2]

14 Steel is a solid alloy made by combining iron with other elements.

(a) Name the type of substances to which alloys such as steel belong.

..... [1]

(b) Explain why the alloy steel is stronger than pure iron.

.....

.....

..... [2]

15 Fig. 15.1 shows two bar magnets placed side by side.

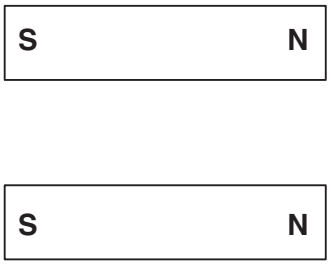

Fig. 15.1

Draw, on Fig. 15.1, the magnetic field lines caused by the arrangement of the two bar magnets. [2]

16 Fig. 16.1 shows metallic bonding in part of the structure of sodium metal.

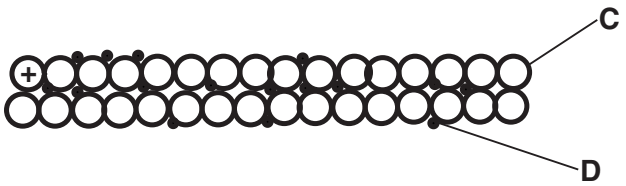

Fig. 16.1

Identify the particles **C** and **D**.

C .....

D ..... [2]

DATA SHEET
The Periodic Table of the Elements

Group																	
I	II										III	IV	V	VI	VII	0
							1 H Hydrogen 1									4 He Helium 2
7 Li Lithium 3	9 Be Beryllium 4										11 B Boron 5	12 C Carbon 6	14 N Nitrogen 7	16 O Oxygen 8	19 F Fluorine 9	20 Ne Neon 10
23 Na Sodium 11	24 Mg Magnesium 12										27 Al Aluminium 13	28 Si Silicon 14	31 P Phosphorus 15	32 S Sulfur 16	35.5 Cl Chlorine 17	40 Ar Argon 18
39 K Potassium 19	40 Ca Calcium 20	45 Sc Scandium 21	48 Ti Titanium 22	51 V Vanadium 23	52 Cr Chromium 24	55 Mn Manganese 25	56 Fe Iron 26	59 Co Cobalt 27	59 Ni Nickel 28	64 Cu Copper 29	65 Zn Zinc 30	70 Ga Gallium 31	73 Ge Germanium 32	75 As Arsenic 33	79 Se Selenium 34	80 Br Bromine 35	84 Kr Krypton 36
85 Rb Rubidium 37	88 Sr Strontium 38	89 Y Yttrium 39	91 Zr Zirconium 40	93 Nb Niobium 41	96 Mo Molybdenum 42	Tc Technetium 43	101 Ru Ruthenium 44	103 Rh Rhodium 45	106 Pd Palladium 46	108 Ag Silver 47	112 Cd Cadmium 48	115 In Indium 49	119 Sn Tin 50	122 Sb Antimony 51	128 Te Tellurium 52	127 I Iodine 53	131 Xe Xenon 54
133 Cs Caesium 55	137 Ba Barium 56	139 La Lanthanum 57 *	178 Hf Hafnium 72	181 Ta Tantalum 73	184 W Tungsten 74	186 Re Rhenium 75	190 Os Osmium 76	192 Ir Iridium 77	195 Pt Platinum 78	197 Au Gold 79	201 Hg Mercury 80	204 Tl Thallium 81	207 Pb Lead 82	209 Bi Bismuth 83	209 Po Polonium 84	210 At Astatine 85	222 Rn Radon 86
223 Fr Francium 87	226 Ra Radium 88	227 Ac Actinium 89 †															

140 Ce Cerium 58	141 Pr Praseodymium 59	144 Nd Neodymium 60	147 Pm Promethium 61	150 Sm Samarium 62	152 Eu Europium 63	157 Gd Gadolinium 64	159 Tb Terbium 65	163 Dy Dysprosium 66	165 Ho Holmium 67	167 Er Erbium 68	169 Tm Thulium 69	173 Yb Ytterbium 70	175 Lu Lutetium 71
232 Th Thorium 90	231 Pa Protactinium 91	238 U Uranium 92	237 Np Neptunium 93	244 Pu Plutonium 94	243 Am Americium 95	247 Cm Curium 96	247 Bk Berkelium 97	251 Cf Californium 98	252 Es Einsteinium 99	257 Fm Fermium 100	258 Md Mendelevium 101	259 No Nobelium 102	260 Lr Lawrencium 103

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

Key

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

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

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