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 2025**

1 hour

Candidates answer on the Question Paper.

Additional materials: Calculator

READ THESE INSTRUCTIONS FIRST

Write your name, centre number and candidate number in 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 bar code.

Answer **all** questions.

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 8.

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

The total number of marks is 40.

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This document consists of **8** printed pages.

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1 Iodine gas changes directly to a solid.

(a) Name this change of state.

..... [1]

(b) Draw the arrangement of particles in solid iodine in Fig. 1.1.



Fig. 1.1

[2]

2 Fig. 2.1 shows a pendulum with a bob swinging between points **A** and **C**.

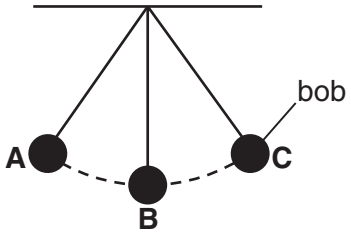


Fig. 2.1

(a) With reference to Fig. 2.1, define the *period* of the pendulum.

.....

..... [2]

(b) The pendulum makes 20 complete swings in 15 seconds.

Calculate the frequency of the pendulum.

State the unit.

..... [2]

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3 $^{35}_{17}Cl$ and $^{37}_{17}Cl$ are isotopes of chlorine.

Explain why both isotopes have:

(a) an overall charge of zero.

..... [1]

(b) the same chemical properties.

.....

..... [1]

4 **(a)** Iron and nickel are examples of magnetic materials.

State what is meant by magnetic materials.

.....

..... [1]

(b) Fig. 4.1 shows two magnets with like poles facing each other.

Draw magnetic field lines between the two poles.



Fig. 4.1

[2]

5 The Group VII elements of the Periodic Table are called halogens.

(a) State the colour and state of matter of bromine at room temperature and pressure.

colour .....

state .....

[2]

(b) When bromine is added to aqueous potassium astatide, a colour change is observed.

Suggest the observed colour change.

..... [1]

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[Turn over

6 A student pushes a trolley of mass 1.2 kg along a horizontal floor for a distance of 4 m.

The student applies a constant force of 15 N on the trolley.

Calculate the work done on the trolley.

..... J [2]

7 Manganese nitrate reacts with sodium hydroxide to form a white precipitate, manganese hydroxide.

Describe how you can obtain pure, dry crystals of manganese hydroxide from the mixture.

.....

.....

.....

..... [3]

8 The lower and upper fixed points are determined when a liquid-in-glass thermometer is calibrated.

(a) Describe the lower fixed point of a thermometer.

.....

..... [1]

(b) State the effect on sensitivity of using a wider capillary tube in a liquid-in-glass thermometer.

..... [1]

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9 Table 9.1 shows observations and products of the electrolysis of concentrated aqueous sodium chloride and aqueous copper(II) sulfate.

(a) Complete Table 9.1 by filling the empty boxes.

Table 9.1

electrolyte	observation at the cathode	name of product at the cathode
concentrated aqueous sodium chloride	bubbles formed	.....
aqueous copper(II) sulfate	.....	copper metal

[2]

(b) Suggest the pH value of the solution formed at the end of the electrolysis of the concentrated aqueous sodium chloride in Table 9.1.

..... [1]

10 Fig. 10.1 shows wavefronts for water waves travelling from shallow water to deep water.

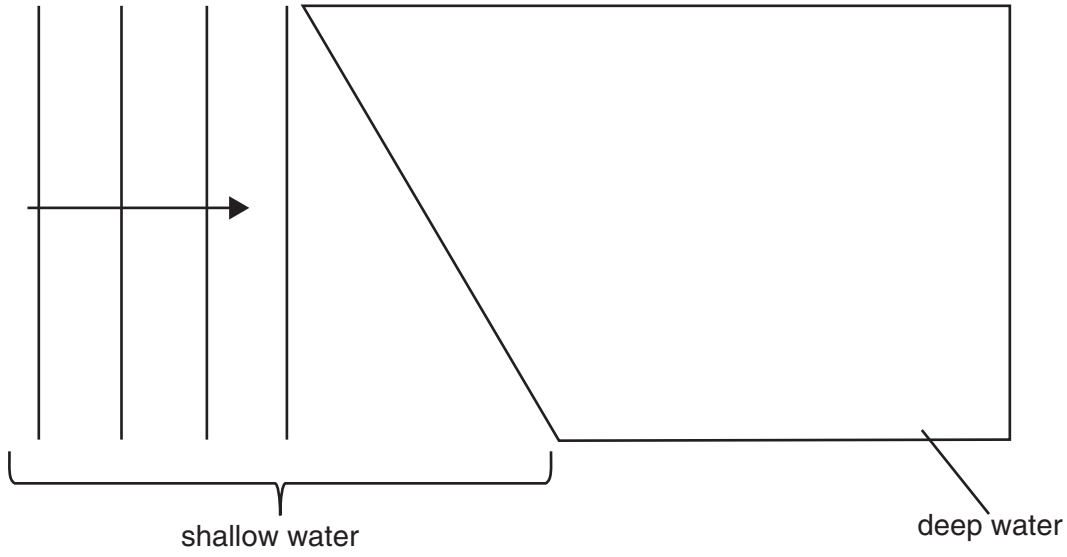


Fig. 10.1

(a) Define the term *wavefront*.

.....

..... [1]

(b) In Fig. 10.1, draw **three** wavefronts to show the waves as they move from shallow water to deep water. [2]

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[Turn over

11 Calcium chloride is an ionic compound. Ethanol is a covalent compound.

Explain why ethanol is more volatile than calcium chloride.

.....

.....

..... [2]

12 α-particles, β-particles and γ–rays are three types of radioactive emissions.

(a) Describe the relative penetrating ability of the β-particles.

.....

..... [2]

(b) State **one** safe way of handling radioactive materials.

..... [1]

13 Fig. 13.1 shows a simple cell.

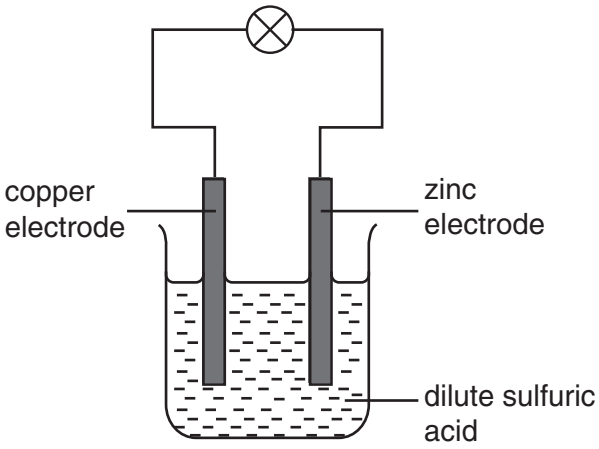


Fig. 13.1

(a) Draw an arrow on Fig. 13.1 to show the direction of electron flow. [1]

(b) State a change that can be made to the cell in Fig. 13.1 to increase the brightness of the bulb.

.....

..... [1]

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14 LEDs are gradually replacing filament light sources.

(a) State the type of material used to make LEDs.

..... [1]

(b) Describe how LEDs produce light.

.....

.....

..... [2]

15 Lead(II) oxide reacts with methane to produce lead.

$4PbO(s) + CH_4(g) \longrightarrow 4Pb(s) + CO_2(g) + 2H_2O(g)$

(a) Explain in terms of oxygen transfer why lead(II) oxide is reduced.

.....

..... [1]

(b) The carbon dioxide gas produced is thought to cause global warming.

State how carbon dioxide causes global warming.

.....

..... [1]

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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 = relative atomic mass; X = atomic symbol; 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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