

EXAMINATIONS COUNCIL OF SWAZILAND
 in collaboration with
 UNIVERSITY OF CAMBRIDGE LOCAL EXAMINATIONS SYNDICATE
 Swaziland General Certificate of Secondary Education

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PHYSICAL SCIENCE

6888/01

Paper 1 Short Answers

October/November 2011

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 all the work you hand in.
 Write in dark blue or black pen in the spaces provided on the Question Paper.
 You may use a soft pencil for any diagrams, graphs, tables or rough working.
 Do **not** use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.

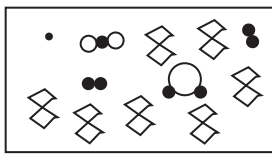
You may use a calculator.

A copy of the Periodic Table is printed on page 12.
 At the end of the examination, fasten all your work securely together.
 The number of marks is given in brackets [] at the end of each question or part question.

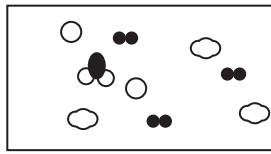
For Examiner's Use

This document consists of **12** printed pages.

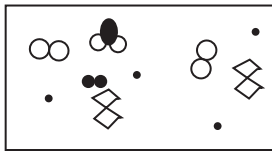
1 The diagrams in Fig. 1.1 represent substances that could be found in air.



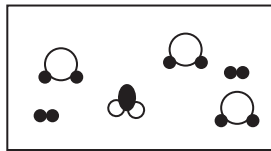
A



B



C



D

Key










-  sulfur dioxide
-  carbon dioxide
-  nitrogen
-  water vapour
-  argon
-  hydrogen gas
-  oxygen gas
-  dust particle
-  neon

Fig. 1.1

Which diagram **A**, **B**, **C**, or **D** best represents a sample of clean air?

.....[1]

2 Name the method by which most heat is transferred when

(a) porridge is cooked in a metal pot on a stove,

.....[1]

(b) a solar panel on the roof of a house is heated by the sun,

.....[1]

(c) a room is warmed by a fire in a fireplace.

.....[1]

3 Fig. 3.1 shows the arrangement of particles in a solid, a liquid and a gas.

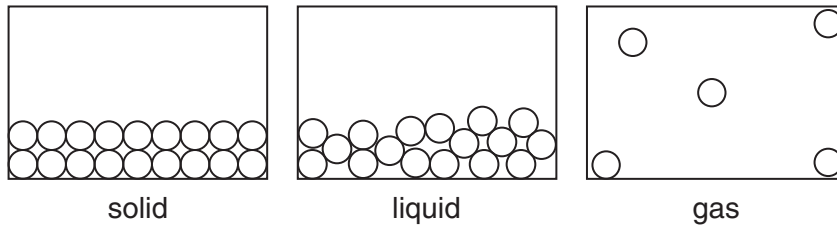


Fig. 3.1

Explain, with reference to the diagrams in Fig. 3.1, why gases can be compressed easily while solids and liquids cannot.

.....

.....

.....[1]

4 Fig. 4.1 shows sketches of speed-time graphs of moving objects.

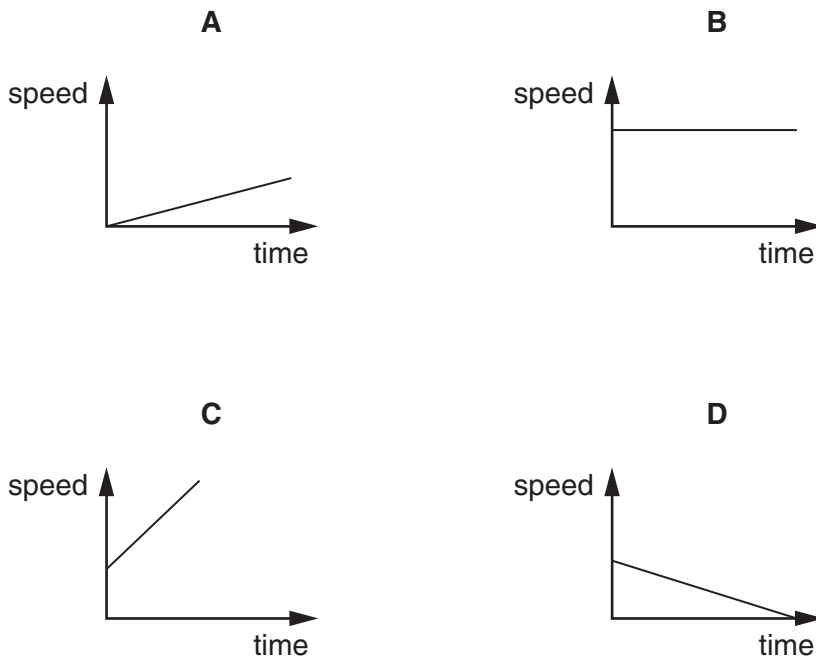


Fig. 4.1

In which graph **A**, **B**, **C** or **D** is the object

(a) **not** accelerating,[1]

(b) accelerating at the greatest rate?[1]

- 5 Fig. 5.1 shows the electronic arrangement of an atom of an element **X**.

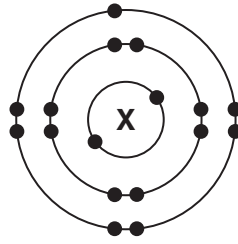


Fig. 5.1

- (a) Explain why element **X** must be a non-metal.

.....
 [1]

- (b) Element **X** is known to react with hydrogen.

Write the molecular formula of the compound formed.

..... [1]

- 6 Fig. 6.1 shows a transverse wave.

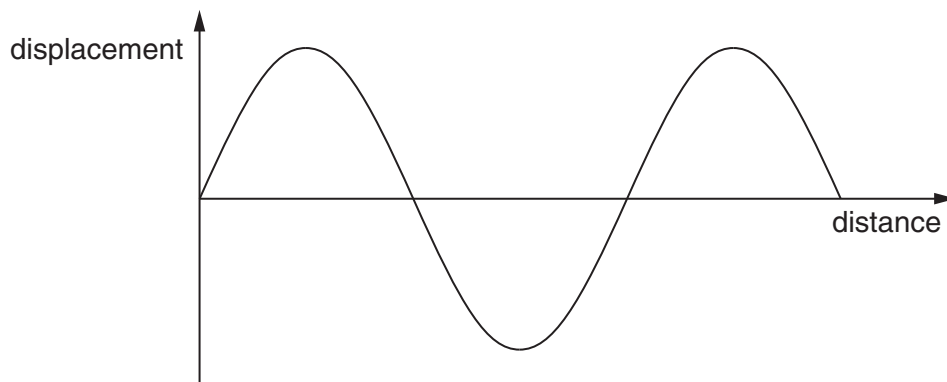


Fig. 6.1

- (a) Show, on Fig. 6.1

(i) the amplitude, and label it (i),

(ii) the wavelength, and label it (ii).

[2]

- (b) Give **two** differences between sound waves and light waves.

.....
 [2]

- 7 Table 7.1 shows some properties of substances **A**, **B**, **C** and **D**.

Table 7.1

substance	state	soluble in water	miscible with water
A	solid	yes	–
B	solid	no	–
C	liquid	–	yes
D	liquid	–	no

State the method of separation for the following mixtures:

- (a) a mixture of a solution of **A** and solid **B**

.....[1]

- (b) a mixture of **C** and **D**

.....[1]

- 8 Magnesium metal reacts with hydrochloric acid to form magnesium chloride, MgCl_2 , and hydrogen gas.

Write a balanced chemical equation to represent this reaction.

.....[2]

- 9 Fig. 9.1 shows a circuit Sizakele sets up to show how the brightness of a bulb changes with the current.

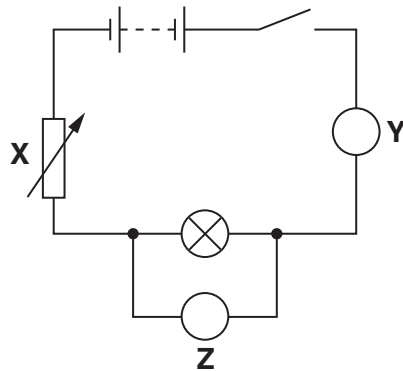


Fig. 9.1

- (a) Name the instrument labelled Y.

Y[1]

- (b) State the purpose of component X in this circuit.

.....[1]

- (c) Another bulb is connected in parallel to the bulb in Fig. 9.1.

State how this will affect the reading on meter Y.

.....[1]

- 10 A burning candle releases heat and light energy to the environment.

- (a) State the name of this type of reaction.

.....[1]

- (b) State a physical change that takes place when the candle burns.

.....[1]

11 Fig. 11.1 shows the electromagnetic spectrum.

Gamma rays	A	Ultra-violet	light	Infra-red	microwaves	Radio waves
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Fig. 11.1

(a) Name the radiation marked **A**.

.....[1]

(b) Name the radiation with the shortest wavelength.

.....[1]

12 Mrs. Masuku wants her pupils to prepare crystals of zinc chloride. She instructs the pupils to add excess zinc powder to hydrochloric acid.

(a) Name the ion that is found in all acids.

.....[1]

(b) Explain why Mrs. Masuku added an excess of zinc powder to the acid.

.....

.....[1]

13 Fig. 13.1 shows pairs of charged plates.

Which diagram **A**, **B**, **C** or **D** shows the correct path followed by electrons passing between the charged plates?

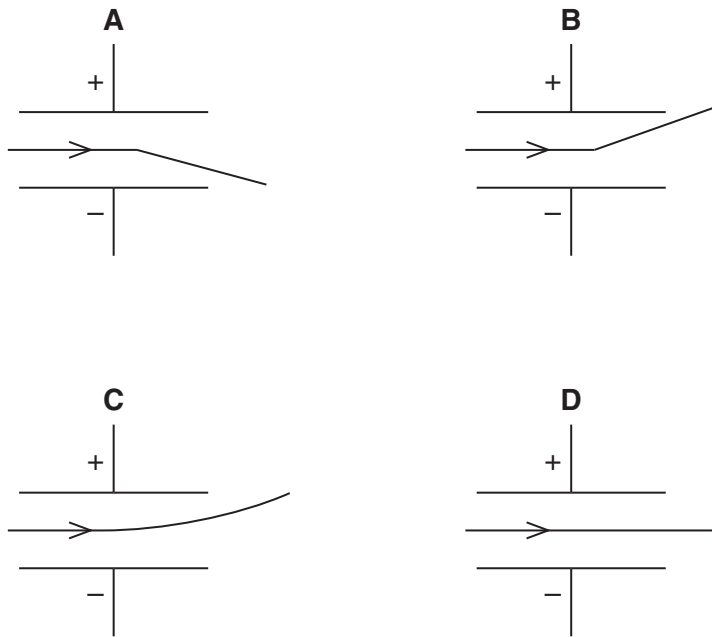


Fig. 13.1

.....[1]

14 Fig. 14.1 shows part of the Periodic Table.

				${}_{5}^{11}\text{B}$				Y	
					Z				
${}_{19}^{39}\text{K}$									X
	R								

Fig. 14.1

The letters in bold are **not** the chemical symbols of the elements.

(a) Which letter **R**, **X**, **Y** or **Z** represents a metallic element?

.....[1]

(b) Explain why element **X** is not reactive.

.....[1]

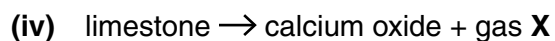
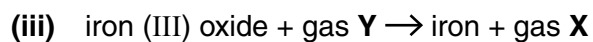
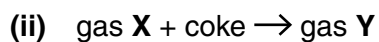
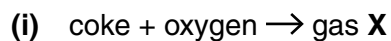
15 A nuclide of radium is represented by ${}_{88}^{226}\text{Ra}$.

State the number of

(a) neutrons, [1]

(b) nucleons. [1]

16 The following is a brief outline of reactions involved in the extraction of iron from its ore.



Name gases X and Y.

X[1]

Y[1]

17 Fig. 17.1 shows a bar magnet.



Fig. 17.1

(a) Draw the magnetic field of the bar magnet. [2]

(b) State **one** advantage of an electromagnet over an ordinary magnet.

.....[1]

18 A student burns magnesium in the laboratory. A very bright white flame is observed and a white solid is produced.

(a) Name the gas that makes the magnesium burn.

.....[1]

(b) Name the white solid that is produced as the magnesium burns.

.....[1]

19 Fig. 19.1 shows the structure of ethane.

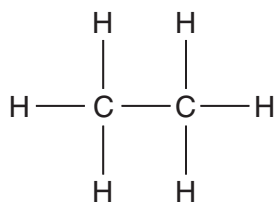


Fig. 19.1

Name the **two** products formed when ethane is burnt in an excess supply of air.

product 1[1]

product 2[1]

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		55 Mn Manganese 25	59 Co Cobalt 27	65 Zn Zinc 30	70 Ga Gallium 31	73 Ge Germanium 32	75 As Arsenic 33	79 Se Selenium 34	84 Kr Krypton 36
	85 Rb Rubidium 37	88 Sr Strontium 38		101 Ru Ruthenium 44	103 Rh Rhodium 45	106 Pd Palladium 46	112 Cd Cadmium 48	115 In Indium 49	119 Sn Tin 50	122 Sb Antimony 51	127 I Iodine 53
	133 Cs Caesium 55	137 Ba Barium 56		144 Nd Neodymium 60	147 Pm Promethium 61	152 Eu Europium 63	159 Tb Terbium 65	162 Dy Dysprosium 66	165 Ho Holmium 67	167 Er Erbium 68	173 Yb Ytterbium 70
	223 Fr Francium 87	226 Ra Radium 88		181 Ta Tantalum 73	184 W Tungsten 74	192 Ir Iridium 77	197 Au Gold 79	201 Hg Mercury 80	204 Tl Thallium 81	207 Pb Lead 82	210 At Astatine 85
				186 Re Rhenium 75	188 Os Osmium 76	195 Pt Platinum 78	201 Hg Mercury 80	209 Po Polonium 84	222 Rn Radon 86		
				227 Ac Actinium 89							
				140 Ce Cerium 58	141 Pr Praseodymium 59	150 Sm Samarium 62	157 Gd Gadolinium 64	162 Dy Dysprosium 66	165 Ho Holmium 67	167 Er Erbium 68	175 Lu Lutetium 71
				232 Th Thorium 90	231 Pa Protactinium 91	244 Pu Plutonium 94	247 Cm Curium 96	251 Cf Californium 98	252 Es Einsteinium 99	257 Fm Fermium 100	260 Lr Lawrencium 103
				144 Nd Neodymium 60	147 Pm Promethium 61	152 Eu Europium 63	159 Tb Terbium 65	162 Dy Dysprosium 66	165 Ho Holmium 67	167 Er Erbium 68	175 Lu Lutetium 71
				238 U Uranium 92	237 Np Neptunium 93	243 Am Americium 95	247 Cm Curium 96	251 Cf Californium 98	252 Es Einsteinium 99	257 Fm Fermium 100	260 Lr Lawrencium 103

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

Key

a	X
b	

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

The volume of one mole of any gas is 24 dm³ at room temperature and pressure (r.t.p.).