EXAMINATIONS COUNCIL OF SWAZILAND
Junior Certificate Examination

CANDIDATE NAME

CENTRE NUMBER | | | | |

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SCIENCE **414/02**

Paper 2 **October/November 2018**

Additional Materials: Electronic calculators **1 hour 45 minutes**

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 ink pen in the spaces provided on the Question Paper.
You may use an HB pencil for any diagrams, graphs and tables or rough working.
Do **not** use staples, paper clips, highlighters or correction fluid.

This paper consists of two sections (Section **A** and **B)**
Answer **all** questions in both sections **A** and **B**.

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

The total of the marks for this paper is 80.

For Examiner's use	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Total	

This document consists of **16** printed pages.

SECTION A

For Examiner's Use

1 Fig 1.1 shows a gift box that was received by Musa for his birthday.

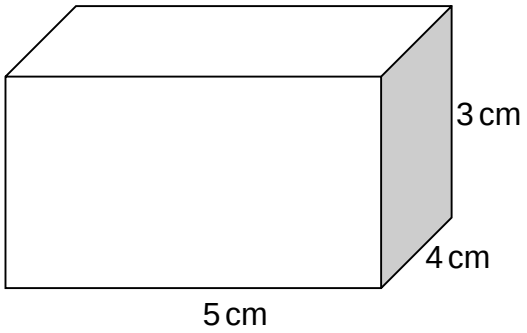


Fig. 1.1

(a) Calculate the volume of the gift box.

volume……[2]

(b) Musa then measured the mass of the gift box using a triple beam balance and found it to be 70 g.

(i) Calculate the density of the gift box.

density..……..[3]

(ii) Musa accidentally dropped his gift box in the swimming pool in his yard.

State and explain if the gift box would sink or float in the water.

[density of water is 1g/cm^3]

….……...

….……...

…..……[2]

[Total: 7]

For Examiner's Use

2 A force is a push, pull or twist on a body. There are different types of forces.

(a) Name the instrument used to measure force.

……[1]

(b) Name any **two** types of forces.

1..……..…….

2..……[2]

(c) Weight is a force.

Give **two** differences between mass and weight.

1 ……..

…….……

2……..

…….……[2]

[Total: 5]

3 Fig. 3.1 shows a car moving along a horizontal straight road.

For Examiner's Use

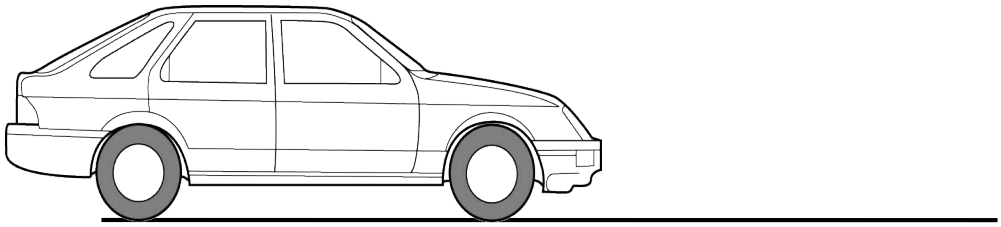


Fig. 3.1

The driver then applies brakes and the car slows down and stops.

(a) Name the force responsible for slowing down the car.

…… ……..[1]

(b) Draw, on Fig.3.1, an arrow to show the direction of the force named in **(a)**. [1]

(c) Name **one** other type of force acting on the car.

……..……..[2]

(d) Fig. 3.2 shows the car hitting a wall.

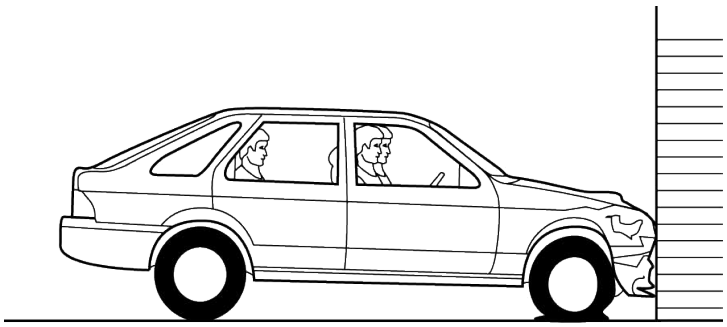


Fig. 3.2

The wall exerts a force on the car.

State **two** effects of the force exerted on the car.

1…….

2……..[2]

[Total: 6]

For Examiner's Use

4 Fig. 4.1 shows a potted plant.

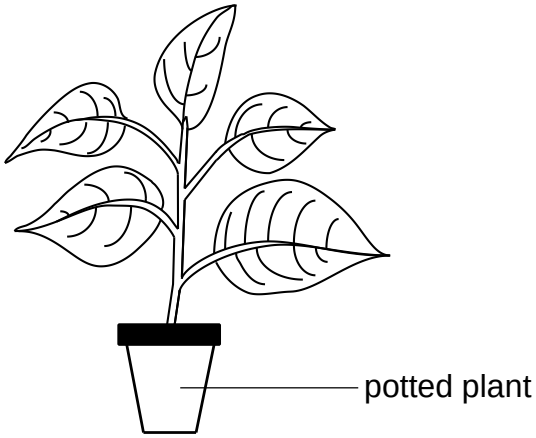


Fig. 4.1

(a) Name the tissue through which the water is transported in the plant.

……[1]

(b) Describe the process that enables the water to enter into the plant leaves.

……

……..

……..

……..

……[3]

(c) The leaves also lose water through the process of transpiration.

Describe what will happen to the rate of transpiration if the leaves are to be enclosed in a plastic bag.

……

……..

……[2]

(d) State why green plants are known as producers.

……

……...[1]

For Examiner's Use

(e) The diagram below shows a simple food chain.

spinach ⟶ rabbit ⟶ lion

(i) What do the arrows (⟶) represent in the food chain.

……[1]

(ii) State and explain which organism has the lowest energy in the food chain.

……

……

……[2]

[Total: 10]

For Examiner's Use

5 Fig. 5.1 shows the female reproductive system.

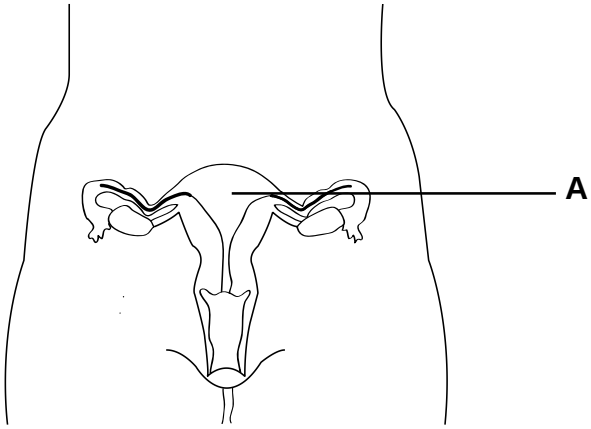


Fig. 5.1

(a) State the function of part labelled **A**.

…….....

…….....[1]

(b) Place an **X** on the part where fertilisation occurs. [1]

(c) A girl who started her menstruation on the 3rd of July had an unprotected sexual intercourse during her ovulation and she fell pregnant.

(i) Describe where and how the process of fertilisation occurred.

.....

…….....

…….....

…….....[3]

(ii) State the likely date when she ovulated.

…….....[1]

(d) A 14 year old girl was infected with syphilis.

State **one** sign and **one** symptom of syphilis.

sign.....

symptom.....

…….…….....[2]

For Examiner's Use

(e) Many young people are involved in the abuse of drugs.

Describe the long-term effects of alcohol abuse on the body.

…….……

……..…

……..……[2]

[Total: 10]

6 State whether each of the following is a compound, an element or a mixture.

air……..……..……

carbon dioxide…….……

oxygen…….....[3]

[Total: 3]

7 Fig 7.1 shows water being heated in the laboratory.

For Examiner's Use

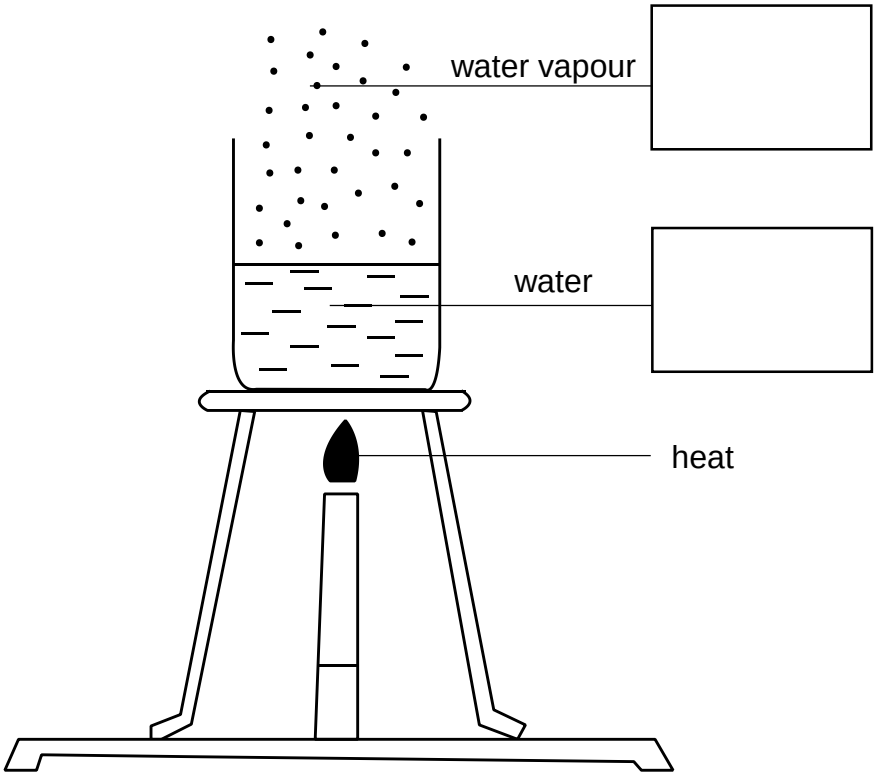


Fig. 7.1

(a) Draw diagrams in the boxes on Fig. 7.1 to show the arrangement of particles in water vapour **and** water. [2]

(b) Name the process that describes the change from water to water vapour.

……[1]

For Examiner's Use

(c) Fig. 7.2 shows a cool saucer held in the water vapour just above the beaker.

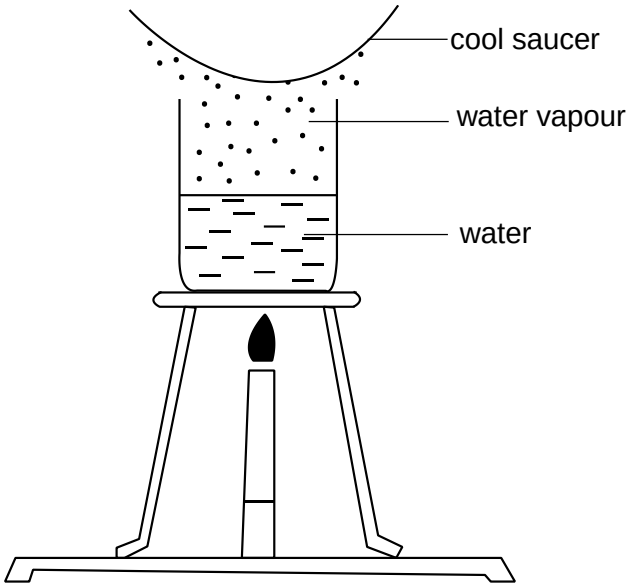


Fig. 7.2

State and explain what would be observed on Fig. 7.2 as the water is heated.

observation..……

..……..……..[1]

explanation……..…….....

……..[1]

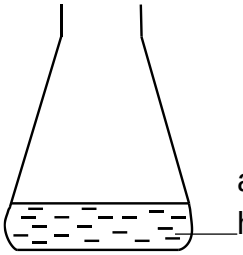
[Total: 5]

For Examiner's Use

8 A student prepares a soluble salt by reacting aqueous sodium hydroxide and dilute hydrochloric acid.

In Fig. 8.1, he adds drops of universal indicator solution into the sodium hydroxide solution.

In Fig 8.2, he gradually adds dilute hydrochloric acid until all the sodium hydroxide solution reacts and a soluble salt is formed after evaporation.



aqueous sodium hydroxide with universal indicator solution

Fig. 8.1

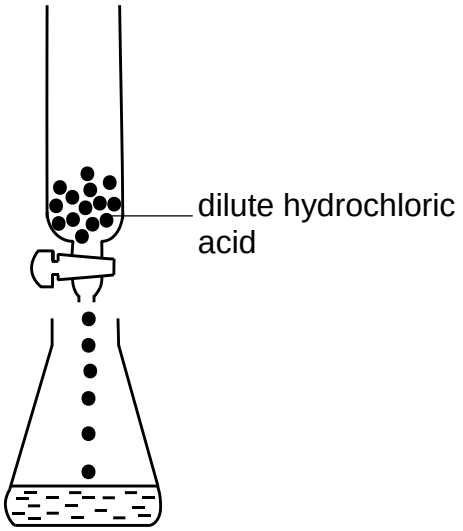


Fig. 8.2

(a) **(i)** State the colour that would be observed in Fig. 8.1.

……[1]

(ii) Suggest the pH value of aqueous sodium hydroxide.

……[1]

(b) **(i)** State the colour that would be observed in Fig. 8.2.

……[1]

(ii) Suggest the pH value of the salt solution.

……[1]

(c) **(i)** Name the soluble salt formed in Fig. 8.2.

……[1]

(ii) State what is meant by the term *soluble*.

……

……[1]

(d) Name the type of reaction between dilute hydrochloric acid and aqueous sodium hydroxide solution.

…….[1]

[Total: 7]

9 Metals from the earth's crust are formed as ores.

State by completing Table 9.1, the name of the ore and the name of the compound in which each metal is found.

Table 9.1

metal	name of ore	name of compound
aluminium		
iron		

[4]

(a) **(i)** Copper is used to make electrical cables and cooking utensils.

Explain why copper is suitable for each use.

use: electrical cables

explanation……..…….

…….[1]

use: cooking utensils

explanation……..…….

……..[1]

(ii) Name an alloy of copper.

……..…….…[1]

[Total: 7]

SECTION B

For Examiner's Use

10 Fig. 10.1 shows a circuit diagram that was set up to measure the potential difference across two bulbs and the current through them.

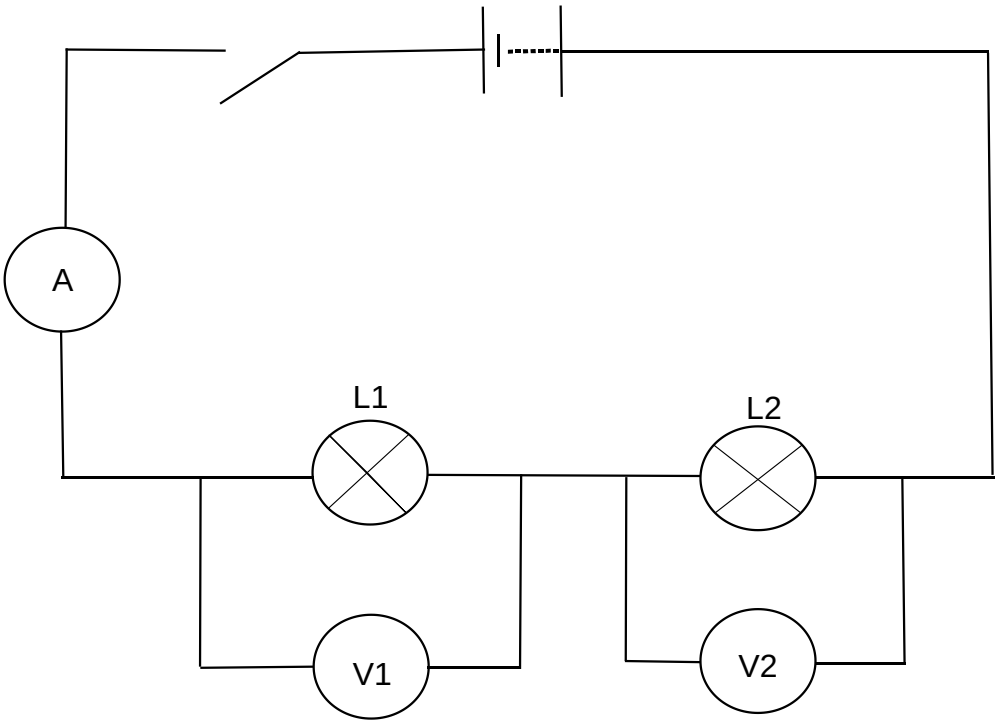


Fig. 10.1

Fig. 10.2 **(a)** and Fig.10.2 **(b)** show the voltmeter faces of V1 and V2.

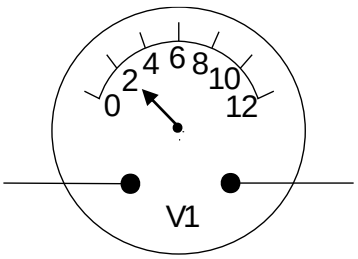


Fig. 10.2 (a)

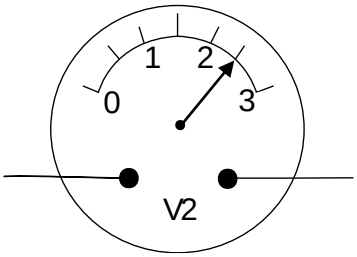


Fig.10.2 (b)

(a) Write down the values of V1 and V2.

V1=……..……...[1]

V2=…….[1]

For Examiner's Use

(b) Draw, on Fig. 10.1 using a standard symbol, a fixed resistor that will reduce the current through the bulbs. [2]

(c) The ammeter reading is 0.3 A.

Calculate the resistance of the lamps L1 and L2.

resistance of L1=……..…..

resistance of L2 =……..….[3]

[Total: 7]

(d) Fig.10.3 shows a diagram of a microscope.

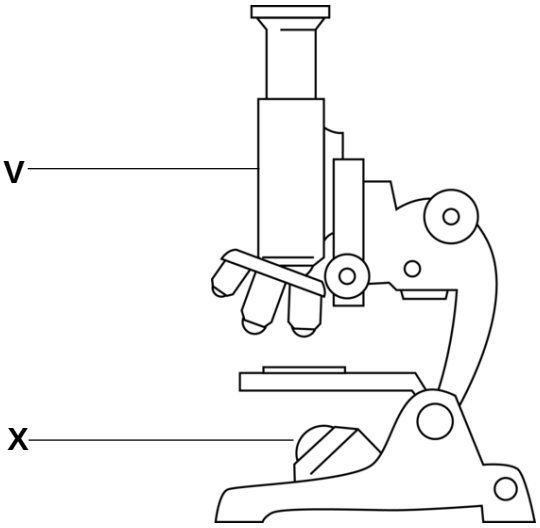


Fig. 10.3

(i) Name the piece of apparatus labelled **V**.

……...[1]

(ii) State the functions of the parts labelled **V** and **X**.

V..……..

X.…….[2]

For Examiner's Use

(e) A student wants to know if a plant that has been kept in darkness for 48 hours can photosynthesize.

The leaves from the plant are then tested for starch.

Describe how chlorophyll would be removed from the leaves.

……..

……..

……..

…….....……..[3]

[Total: 6]

(f) Students in a Form 4 class carried out an experiment to measure the temperature change when four different metals **A**, **B**, **C** and **D** are reacted with dilute hydrochloric acid.

Table 10.1 shows the results they obtained.

Table 10.1

metal	initial temperature ^{o}C	final temperature ^{o}C	temperature change ^{o}C	observations
A	21	24.5	…….	bubbles are given off slowly
B	20	…….	8.2	bubbles produced moderately
C	……..	43.5	23	bubbles produced more rapidly.
D	20	20	0	no bubbles given off

(i) Complete Table 10.1 by filling in the missing information. [1]

(ii) State **one** factor that should be kept constant during this investigation.

……..[1]

For Examiner's Use

(iii) Using the information in Table 10.1, state, with **two** reasons, the metal that is most reactive.

metal..……..……

reasons

1…..……..……...

……

2……..……

……..……[3]

(iv) Describe how the gas released could be collected during this reaction.

…..……..[2]

[Total: 7]