ZIMSEC

For Performance Measurement

Zimbabwe School Examinations Council

GENERAL CERTIFICATE OF EDUCATION
ORDINARY LEVEL

INTEGRATED SCIENCE 5006

Past Question Papers and Expected Answers

June 2008 - November 2010 Examinations

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

INTEGRATED SCIENCE 5006/1

PAPER 1 Multiple Choice

JUNE 2008 SESSION 1 hour

Additional materials:
Multiple Choice answer sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

TIME 1 hour

INSTRUCTIONS TO CANDIDATES

Do not open this booklet until you are told to do so.
Write your name, Centre number and candidate number on the answer sheet in the spaces provided unless this has already been done for you.

There are **forty** questions in this paper. Answer **all** questions. For each question there are four possible answers, **A, B, C** and **D**. Choose the **one** you consider correct and record your choice in **soft pencil** on the separate answer sheet.

Read very carefully the instructions on the answer sheet.

INFORMATION FOR CANDIDATES

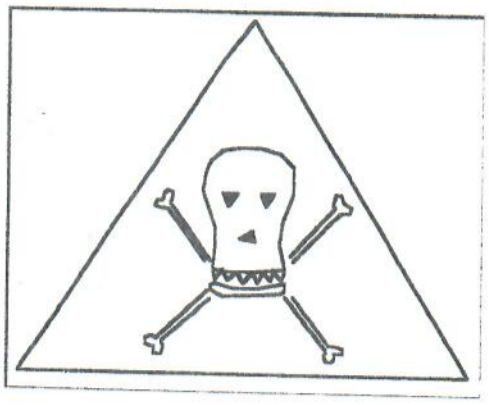
Each correct answer will score one mark. A mark will not be deducted for a wrong answer. Any rough working should be done in this booklet.

This question paper consists of 13 printed pages and 3 blank pages.

1 Which two processes in plants use carbon dioxide and oxygen respectively?

A absorption and transpiration
B photosynthesis and respiration
C respiration and photosynthesis
D transpiration and absorption

2 The diagram shows a warning sign on a container.



Which danger is indicated about the chemical substance?

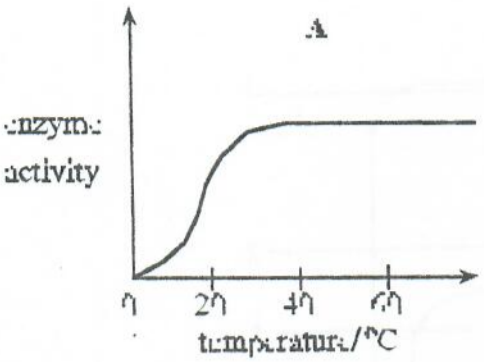
A corrosive
B flammable
C poisonous
D radioactive

3 Where does the final digestion of protein occur?

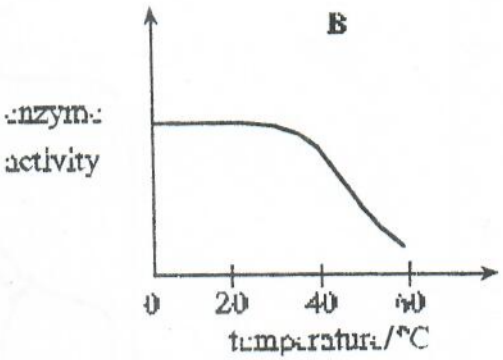
A stomach
B caecum
C liver
D small intestines

4 Which graph shows the effect of temperature on the activity of an enzyme?

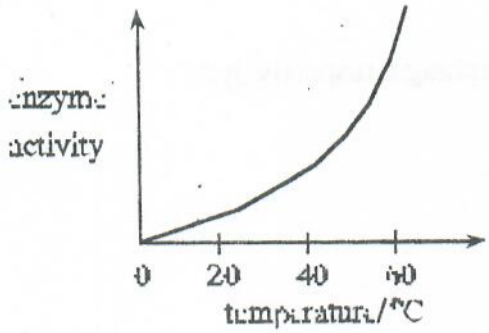
A



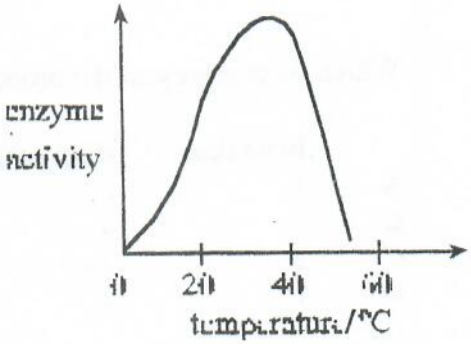
B



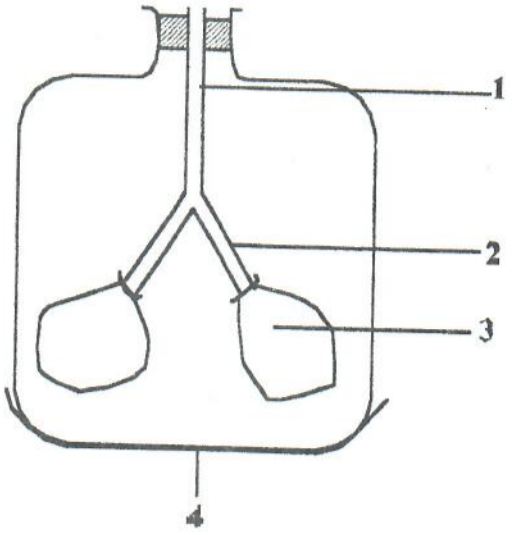
C



D



5 The diagram shows a model of the human respiratory system.



Which parts represent the bronchus and diaphragm respectively?

	bronchus	diaphragm
A	1	2
B	2	4
C	2	3
D	1	4

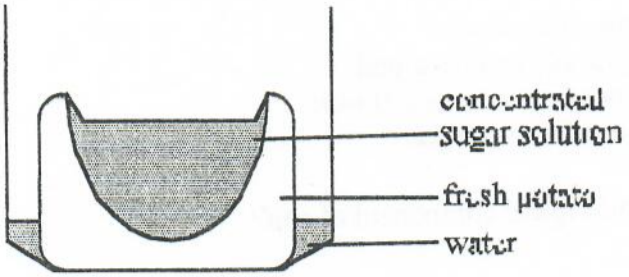
6 What is the word equation for aerobic respiration?

A glucose $\xrightarrow{\text{enzyme}}$ ethanol + carbon dioxide
B glucose + oxygen → carbon dioxide + water
C glucose + oxygen → carbon monoxide + water
D glucose + oxygen → ethanol + carbon dioxide

7 Which leaf adaptation reduces water loss?

A presence of many stomata
B large surface area
C thick cuticle
D absence of hairs

8 The diagram shows an experiment set up to investigate osmosis.



What happens to the levels of the sugar and water during a period of 24 hours?

	sugar solution	**water**
A	falls	falls
B	falls	rises
C	rises	falls
D	rises	rises

9 Where is the highest blood pressure developed during a heart beat?

A left atrium
B left ventricle
C right atrium
D right ventricle

10 Where are pollen grains deposited during pollination?

A anther
B ovary
C ovule
D stigma

11 Where is food stored in a maize seed?

A testa
B endosperm
C plumule
D radicle

12 Which feature in a bean plant is determined by both the environment and genetics?

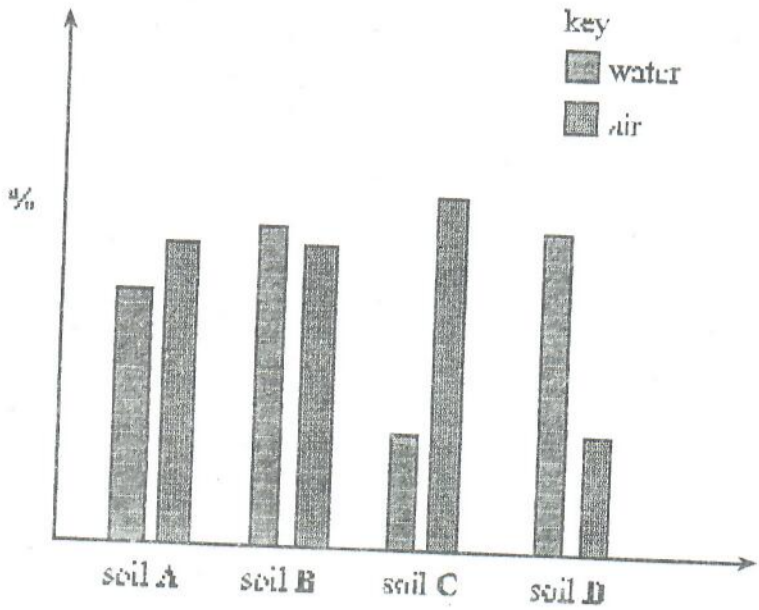
A colour of the seed
B number of seeds in a pod
C number of petals on a flower
D shape of the seed pod

13 Which is a biological component of soil?

A air
B humus
C mineral salts
D water

14 The bar chart shows the percentages of air and water in equal volumes of different soil types.

Which pair of bars represents a clay soil?



15 What gas is produced when magnesium reacts with steam?

A carbon dioxide
B hydrogen
C nitrogen
D oxygen

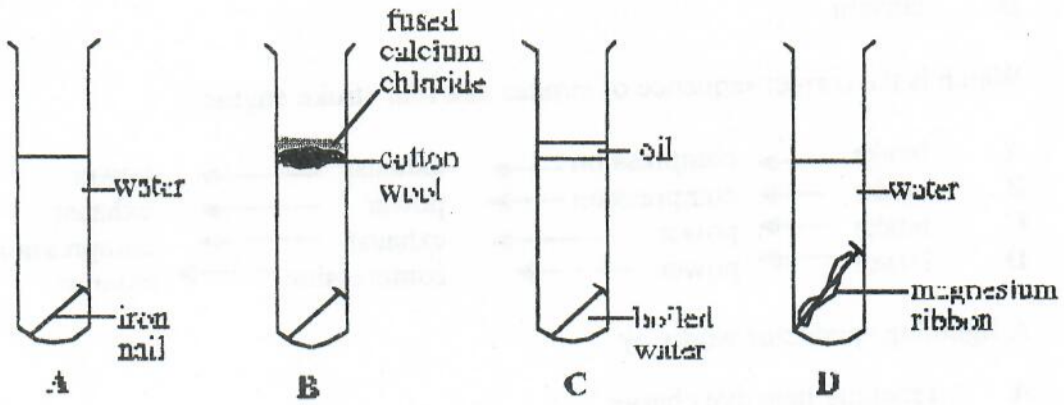
16 Which is a constituent of bronze?

A nickel
B lead
C tin
D zinc

17 Which is a use of nitric acid?

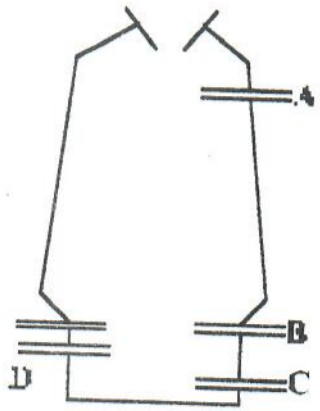
A drying agent
B manufacture of detergents
C manufacture of fertilisers
D refrigerant

18 The diagram shows an experiment to investigate factors necessary for rusting of iron. Which nail will rust first?



[Turn over

19 The diagram shows a blast furnace. At which opening does molten iron come out?



20 Which fuel is produced from biological waste by fermentation?

A biogas
B charcoal.
C coal
D ethanol

21 Which is the correct sequence of strokes in a four stroke engine?

A	intake →	compression →	exhaust →	power
B	intake →	compression →	power →	exhaust
C	intake →	power →	exhaust →	compression
D	intake →	power →	compression →	exhaust

22 A lightning conductor works by

A repelling negative charge.
B preventing lightning from forming.
C attracting positive ions.
D carrying negative charge to the ground.

23 Under what conditions will resistance be highest?

	current	**voltage**
A	high	low
B	high	high
C	low	high
D	low	low

24 Which instrument is used to measure an electric current?

A ammeter
B galvanometer
C hydrometer
D voltmeter

25 Which device will convert chemical energy to electrical energy?

A motor
B generator
C primary cell
D petrol engine

26 Which set of electrodes will produce the greatest voltage?

A magnesium and copper
B aluminium and copper
C magnesium and iron
D zinc and copper

27 Hollow beams are preferable to solid beams because hollow beams are

A lighter and easier to construct.
B heavier and equally strong.
C lighter but equally strong.
D lighter but not strong.

28 Earth dam walls are built with a wider base because water pressure

A increases with depth.
B acts equally in all directions.
C decreases with depth.
D remains the same with depth.

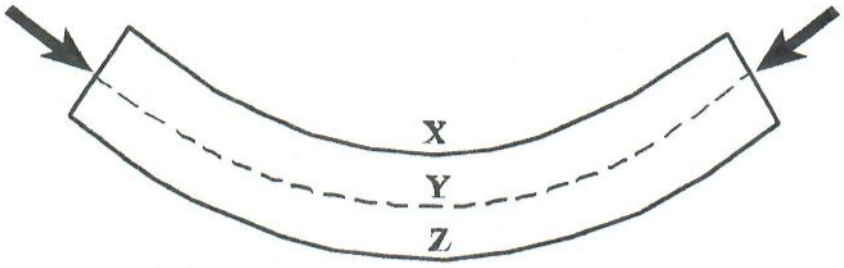
29 A pulley system whose velocity ratio is 18 has a mechanical advantage of 4. The ratio efficiency of the system is

A 0.22%.
B 0.45%.
C 22%.
D 45%.

30 What is the formula used to calculate the pressure of a liquid?

A pgh
B pg + p
C pgh + p
D pg + h

31 The diagram shows a sponge being squeezed.



Which force is experienced by the layer **Y**?

A tension and compression
B tension only
C compression only
D neutral force

32 What is the effect of lack of vitamin A in a child's diet?

A kwashiorkor
B obesity
C poor sight
D stunted mental growth

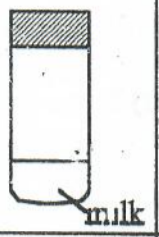
33 Tooth decay is the result of

A acid destruction of enamel.
B bacteria dissolving the enamel.
C eating the wrong foods.
D sugar eating away the enamel.

34 Which diseases are caused by smoking and excessive alcohol consumption respectively?

	smoking	excessive alcohol consumption
A	bronchitis	TB
B	cirrhosis	heart disease
C	heart disease	emphysema
D	lung cancer	cirrhosis

35 The table shows an experiment to investigate the growth of bacteria in milk.

test tube 1	2	3	4
			
boiled	unheated	unheated	warm
sealed	sealed	left open	left open
at room temp	at room temp	at 4 °C	at room temp

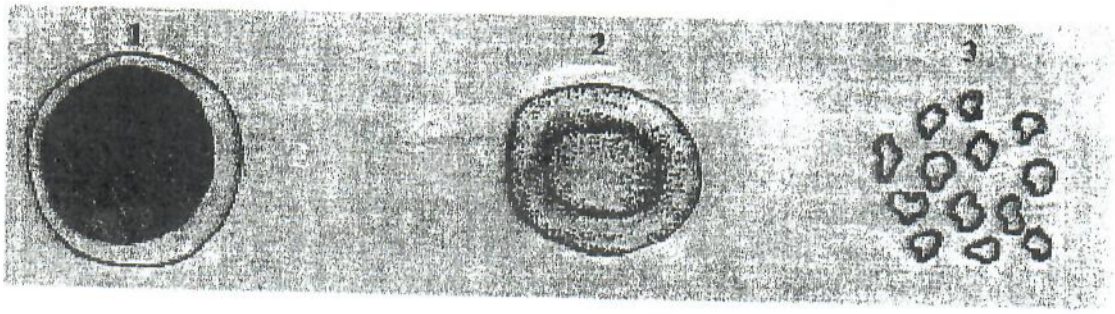
In which pair of test tubes is the milk likely to have soured within 2 days?

A 1 and 2
B 1 and 3
C 2 and 4
D 3 and 4

36 The type of immunity produced when person is injected with attenuated pathogens is

A artificial and active.
B natural and active.
C artificial and passive.
D natural and passive.

37 The diagrams show components of human blood.



Which component is targeted by the malaria parasite and HIV?

	Malaria parasite	HIV
A	1	2
B	1	3
C	2	1
D	2	3

38 During which process are gametes released from the ovary?

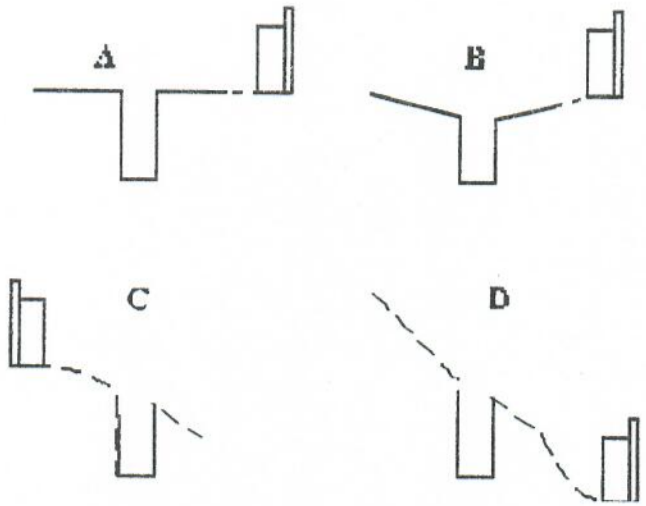
A fertilisation
B implantation
C menstruation
D ovulation

39 What would be the most readily detectable sign of gonorrhoea in men?

A blockage of sperm ducts
B discharge of pus from the penis
C painless sore on the sex organ
D passing of urine with blood

40 The diagrams show the positions of a blair toilet relative to a water well on four different slopes of land.

Which well provides the safest drinking water?



ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

POSSIBLE ANSWERS

JUNE 2008

INTEGRATED SCIENCE 5006/1

INTEGRATED SCIENCE – 5006/01 – JUNE 2008

SUGGESTED ANSWERS

1.	B	21.	B
2.	C	22.	D
3.	D	23.	C
4.	D	24.	A
5.	B	25.	C
6.	B	26.	A
7.	C	27.	C
8.	C	28.	A
9.	B	29.	C
10.	D	30.	A
11.	B	31.	D
12.	B	32.	C
13.	B	33.	A
14.	D	34.	D
15.	B	35.	C
16.	C	36.	A
17.	C	37.	C
18.	A	38.	D
19.	C	39.	B
20.	A	40.	D

Candidate Name | Centre Number | Candidate Number

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

INTEGRATED SCIENCE

PAPER 2

5006/2

JUNE 2008 SESSION

2 hours

Additional materials:
Answer paper

TIME 2 hours

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page and on all separate answer paper used.

Section A

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

Section B

Answer **all** questions.

Write your answers on the separate answer paper provided.

At the end of the examination, fasten the separate answer paper securely to the question paper.

INFORMATION FOR CANDIDATES

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

You are advised to spend no longer than 45 minutes on Section A and 1 hour 15 minutes on Section B.

FOR EXAMINER'S USE	
Section A	
Section B	
6	
7	
8	
9	
10	
TOTAL	

This question paper consists of 9 printed pages and 3 blank pages.

[Turn over

Section A

*Answer **all** questions in this section in the spaces provided.*

You are advised to spend no longer than 45 minutes on this section.

1 **Fig. 1** shows a longitudinal section of a maize seed.

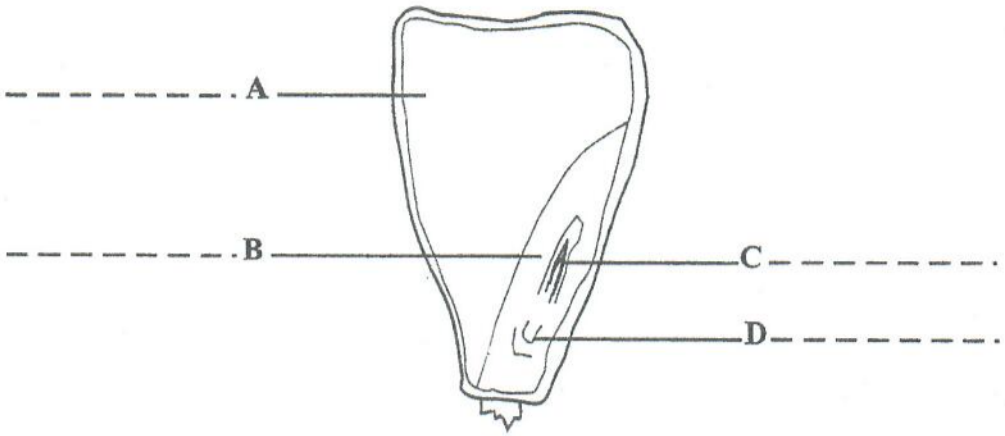


Fig. 1

(a) **(i)** On the diagram label parts **A** to **D**. [4]

(ii) Describe the function of part **A**.

_____

_____

_____ [1]

(b) A farmer realised that germination in one of his fields was very poor.

Suggest **three** possible reasons for the poor germination.

1 _____

_____

2 _____

_____

3 _____

_____ [3]

[Total: 8]

For Examiner's Use

2 (a) An iron nail fell into soil. After a few days the nail turned from grey colour to brown.

(i) Name the process that caused the nail to change colour.

_____ [1]

(ii) Describe the process above in terms of gain or loss of oxygen.

_____

_____ [1]

(iii) Explain why iron poles used in fences are painted or coated with other metals.

_____

_____

_____

_____ [2]

(b) (i) State the raw materials used in the manufacture of nitric acid.

_____

_____ [2]

(ii) State **two** industrial uses of nitric acid.

1 _____

2 _____ [2]

[Total: 8]

For Examiner's Use

3 Coal is one of the fossil fuels found in Zimbabwe.

(a) (i) Define the term *fuel*.

_____

_____ [1]

(ii) State the form in which coal occurs in Zimbabwe.

_____

_____ [1]

(iii) Coal was burnt in limited air to produce coke. State **two** other products of this process.

1 _____

2 _____ [2]

(b) Explain why the Hwange Thermal Electric Power Station is located in Hwange.

_____

_____

_____ [2]

(c) An electric iron is rated 210 V and 30 Ω. Calculate the current flowing through the iron.

current = _____ [2]

[Total: 8]

4 **Fig. 2** shows a pulley system used to lift heavy loads.

For Examiner's Use

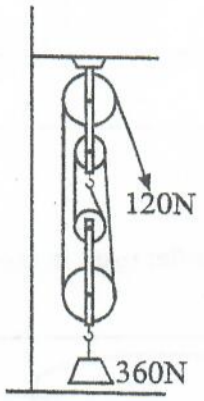


Fig. 2

(a) **(i)** State the velocity ratio of the pulley system.

_____

_____ [1]

(ii) Calculate the mechanical advantage (MA) of the machine.

MA = _____ [2]

(iii) Calculate the efficiency of the machine.

efficiency = _____ [2]

For Examiner's Use

(b) State **three** other examples of machines.

_____

_____

_____ [3]

[Total: 8]

5 **Fig. 3** shows a Blair ventilated pit toilet used in most rural homes.

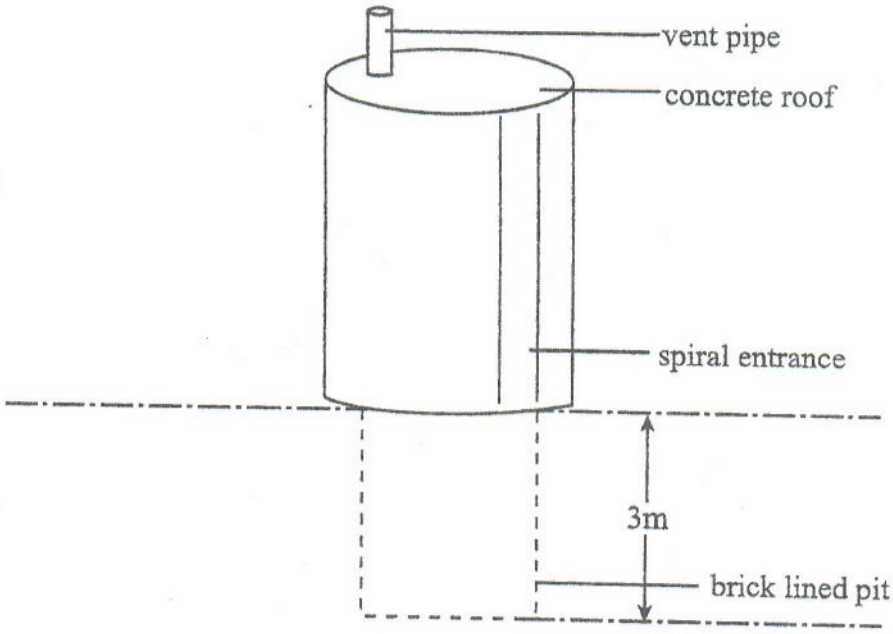


Fig. 3

(a) (i) Describe what happens to waste in the brick lined pit.

_____

_____

_____ [2]

(ii) Explain the purpose of the vent pipe.

_____

_____ [2]

For Examiner's Use

(iii) State **one** other method of sewage disposal.

_____

_____

_____ [1]

(b) (i) Describe what is meant by safe clean water.

_____

_____

_____ [2]

(ii) Explain the importance of protecting water sources.

_____

_____ [1]

[Total: 8]

Section B

*Answer **all** questions on the separate answer paper.*

6 **Fig. 4** shows the alimentary canal of a heifer.

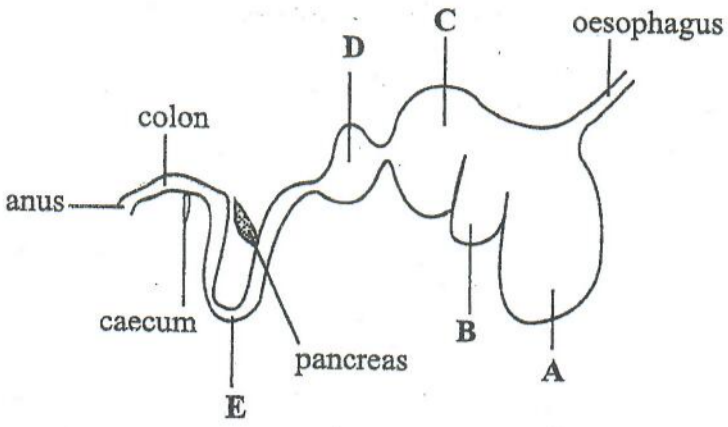


Fig. 4

(a) **(i)** State the parts labelled **A** to **E**. [5]

(ii) Describe what happens to food in.

1 part **A**,

2 part **B**. [3]

(b) Suggest the importance of digested food to the heifer. [4]

[Total: 12]

7 **(a)** Outline how industrial gases are manufactured from air. [7]

(b) One of the gases is given to patients in hospitals. Identify and explain how this gas saves life. [5]

[Total: 12]

8 **(a)** Draw a fully labelled diagram of a dry cell. [6]

(b) Two dry cells used in a small radio stopped working and these were placed in sunlight for the whole day. They were found to be working again when placed in the radio.

(i) What could have caused the cells to stop working? [1]

(ii) Explain why the dry cells started working again. [5]

[Total: 12]

9 Fig. 6 shows an arch below b ridge deck.

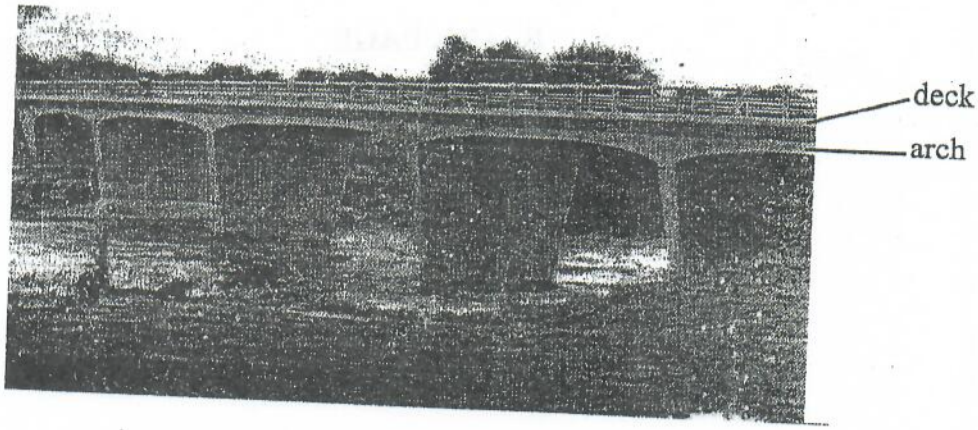


Fig. 6

(a) (i) State the materials that are used to make the deck and the arch. Describe the physical properties of these materials that make them suitable. [4]

(ii) Some materials like the ones used in arches are said to be durable. Explain what is meant by the term *durable*. [2]

(b) With the aid of a diagram, describe an experiment that can be carried out to compare the strength of two beams of different materials. [6]

[Total: 12]

10 Breast milk is said to be a balanced diet. The World Health Organisation and the Ministry of Health and Child Welfare encourage breast feeding for eighteen months instead of bottle feeding.

(a) (i) State food components present in breast milk. [5]

(ii) What reasons are given to support breast feeding instead of bottle feeding? [4]

(b) Describe how active immunity is acquired after a child has been vaccinated. [3]

[Total: 12]

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ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

POSSIBLE ANSWERS

JUNE 2008

INTEGRATED SCIENCE **5006/2**

1 (a) (i) A: endosperm;
B: cotyledon;
C: plumule;
D: radical; [4]

(ii) stores food (needed during germination); [1]

(b) unsuitable temperature (can either be too high or too low)
Lack of enough moisture;
Lack of oxygen/air;
Root/shoot systems destroyed [3]

Total [8]

2 (a) (i) oxidation/rusting ; [1]

(ii) gain of oxygen; [1]

(iii) painted: prevents contact of air/oxygen;
Water; iron; [2]

(b) (i) ammonia;
Oxygen; [2]

(ii) manufacture of: ammonia fertilisers;
Explosives;
Dyes; plastics; drugs; [2]

Total: [8]

3 (a) (i) material that can be burnt to give out heat/have chemical energy; [1]

(ii) bituminous [1]

(iii) (coal) gas; gas alone without coal can be accepted as a correct answer
Benzol;
Ammonia;
(Coal) tar; tar alone is acceptable [2]

(b) coal mined in Hwange;
Reduces transportation costs [2]

(c) I = V/R / $210/30$
= 7A; the unit needs to be correct for the candidate to access the mark

Total [8]

4 (a) (i) 4; V.R has no unit [1]

(ii) MA = L/E / $360/120$;

= 3; M.A has no unit [2]

(iii) E = MA/VR / $3/4$

= 0.75 / 75% [2]

(b) lever;
Gear;
Wheel and axle; any three
Inclined plane; [3]

Total [8]

5 (a) (i) bacteria;
Decompose/ ferment / breakdown wastes [2]

(ii) outlet for waste gases/ smell
Traps flies; provides light; any two [2]

(iii) water closet; [1]

(b) (i) absence of: pathogens;
Pollutants; [2]

(ii) prevent contamination;
by animals/ humans;
through seepage; water remain safe and clean; any one [1]

Total [8]

SECTION B

6 (a) (i) A: rumen;
B: reticulum;
C: omasum;
D: abomasum;
E: ileum/ small intestines; [5]

(ii) bacteria;
Produce enzyme;
Digest/ breakdown cellulose;
To simple sugars; for both A and B [3]

(b) absorption ;
Amino acids; growth / repair of tissues;
Fatty acids and glycerol: energy;
Glucose; energy;
Minerals; teeth /bone; for making them strong [4]

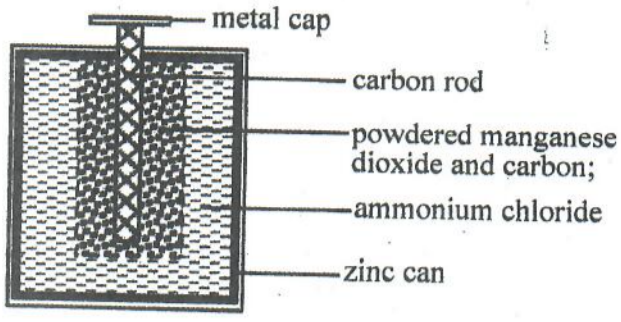
Total [12]

7 (a) Gases different boiling points;
Air cooled to -56°C ;
Water and carbon dioxide; turn to solid / removed;
Air compressed to a pressure of 150 atoms; (this heats up the gases)
Heated gases/ allowed to cool;
Compressed gases allowed to expand quickly;
Lowers the temp to -200°C;
Gases turn to liquids;
Liquified gases pumped into a fractionating tower;
Nitrogen: bp -196°C turns to a gas and collected;
Oxygen; bp -183°C remain liquid /taken from bottom; [7]
Look for correct points from a description sequence not emphasised.

(b) oxygen; taken to tissues/cells; patients with respiratory problems;
(for)respiration;
Produce energy;
Needed for body functions;
Look for these points from a description and award up to 5 marks [5]

Total [12]

8 (a)



[6]

(b) (i) polarisation; a description of polarisation is acceptable [1]

(ii) with time;
powdered manganese dioxide;
depolarised/ oxidised the hydrogen; to form water;

Or

light; activated;
powdered manganese dioxide;
depolarise; oxidise;
hydrogen; [5]

Total [12]

9 (a) (i) deck: reinforced concrete; strong in both tension and compression;
Arch: concrete/stone / brick; strong in compression; [4]

(ii) resist: decay; corrosion/rusting; [2]

(b) beams of the same mass;
same cross – sectional area;
hung at same points at both ends;
loaded with same weights (masses) at centres;
one beam breaks at lower mass;
beam weaker; beam break higher mass;
beam (is) stronger; [6]
Diagram only gets a maximum of 3 marks. Total [12]

10 (a) (i) fats;
water;
carbohydrates;
minerals;
proteins; [5]

(ii) not contaminated;
suitable temperature;
antibodies; defend baby against diseases; [4]

(b) weak/ dead pathogens introduced;
white blood cells;
produce antibodies;
fight pathogens;
white blood cell know;
antibodies to produce in future; [3]

Total [12]

Candidate Name	Centre Number	Candidate Number

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

INTEGRATED SCIENCE 5006/3

PAPER 3

JUNE 2008 SESSION 1 hour

Candidates answer on the question paper

Additional materials:

Soft pencil (type B or HB is recommended)
Soft clean eraser
Ruler (cm/mm)
Mathematical tables/calculator

Time 1 hour

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page.
Answer **all** questions.
Write your answers in the spaces provided on the question paper.

INFORMATION FOR CANDIDATES

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

FOR EXAMINER'S USE	
1	
2	
3	
4	
TOTAL	

This question paper consists of 10 printed pages and 2 blank pages.

[Turn over

For Examiner's Use

1 **Fig. 1.1** shows apparatus suitable for collecting and measuring the volume of gas produced when zinc reacted with dilute sulphuric acid.

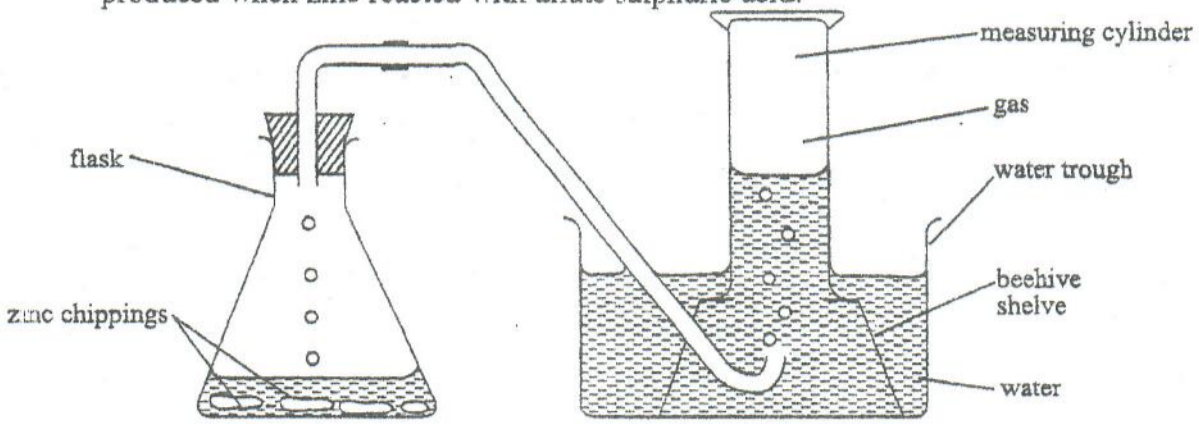


Fig. 1.1

The measuring cylinder was first filled completely with water. A wet filter paper was put over the mouth of the measuring cylinder which was then carefully inverted into water in a trough as shown in **Fig. 1.1**.

(a) **(i)** Suggest a reason why the measuring cylinder was completely filled with water and inverted into the water trough.

_____

_____

_____ [2]

(ii) Identify a possible source of error in the experiment.

_____

_____ [1]

For Examiner's Use

(b) The results of the experiment are shown in **Fig. 1.2** as graph **X**.

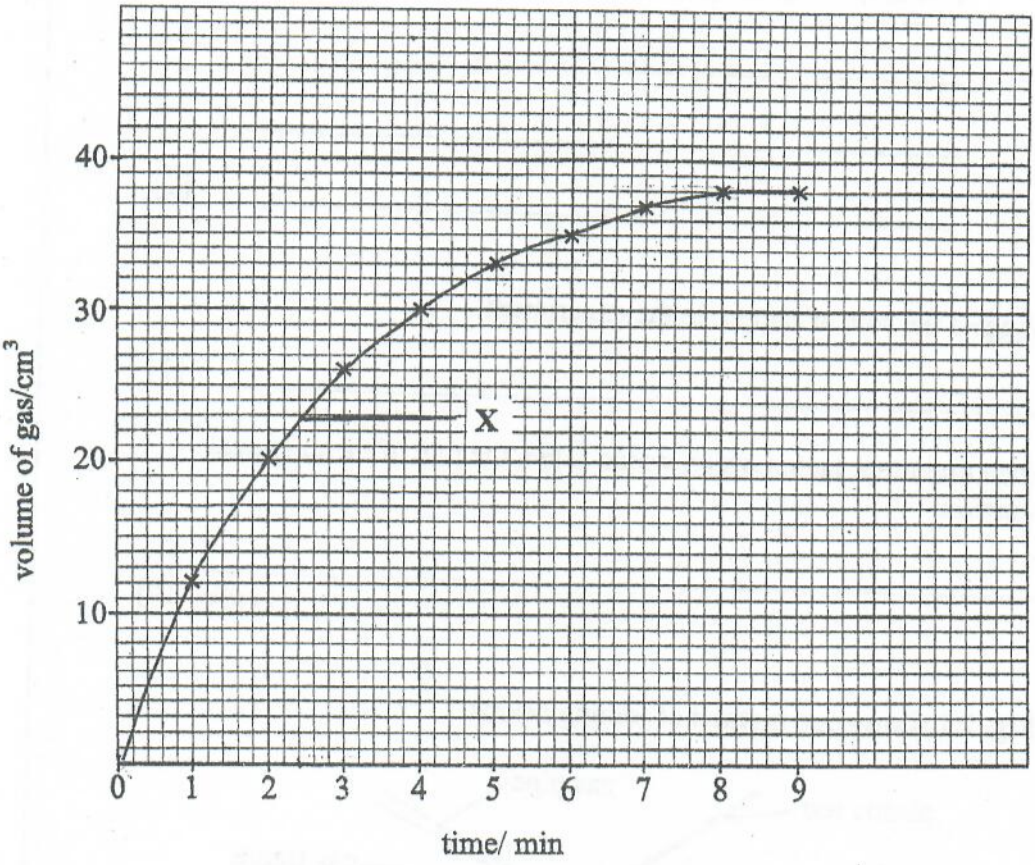


Fig. 1.2

From the graph, find the volume of gas collected after 1.5 minutes.

_____ [1]

(c) The experiment was repeated under the same conditions but with copper chippings added. The results obtained are shown in **Table 1** below.

Table 1

Time/mins	0	1	2	3	4	5	6	7	8	9
Volume of gas/cm^3	0	20	30	34	36	37	37.5	38	38	38

(i) Plot these results as graph **Y** on **Fig. 1.2**. [2]

For Examiner's Use

(ii) Compare the rate of chemical reactions after **two** minutes with that at the beginning of the experiment.

_____

_____

_____ [2]

(d) Suggest the role of copper in the experiment.

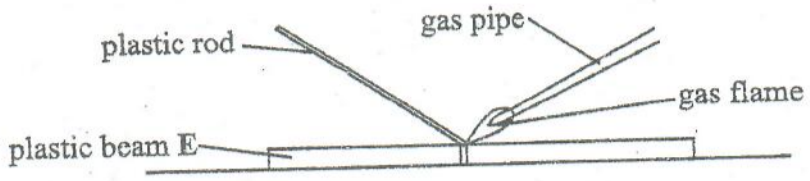
_____ [1]

(e) State **one** other factor which would affect the rate of the chemical reaction.

_____ [1]

[Total: 10]

2 (a) **Fig. 2.1** shows one method of joining beams.



(i) State the method being demonstrated.

_____ [1]

(ii) Describe how the beams were joined.

_____

_____

_____

_____ [2]

(b) **Fig. 2.2** shows a beam joined at the centre.

For Examiner's Use

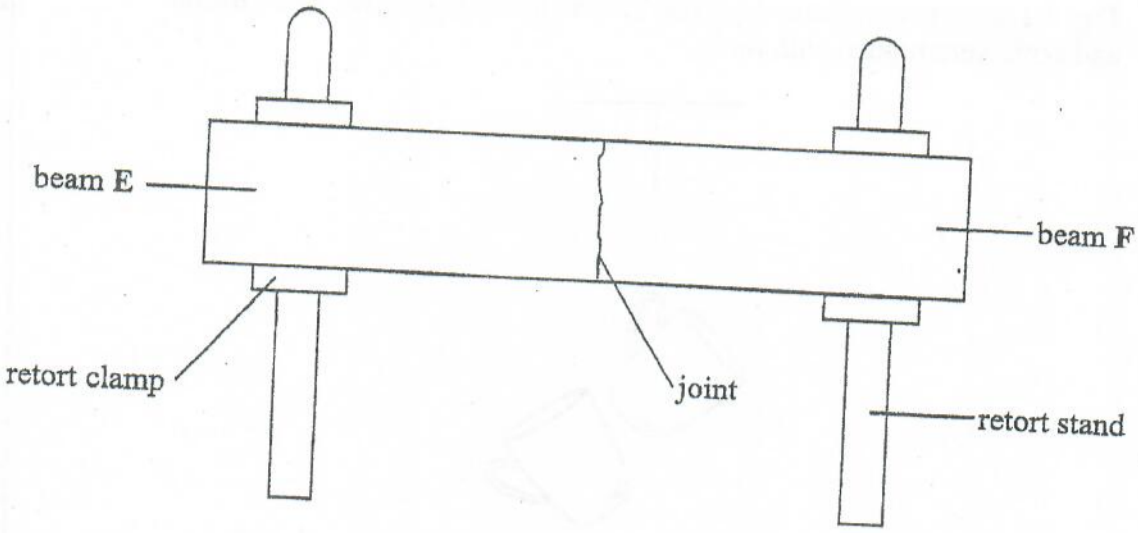


Fig. 2.2

The strength of the joint was tested using bricks.

(i) Describe the test.

_____

_____

_____

_____

_____

_____ [3]

(ii) Show and label the stresses produced in the beam during the test.

[3]

(c) Suggest the effect on the strength of the beam if the material is removed and the beam becomes hollow.

_____

_____ [1]

[Total: 10]

For Examiner's Use

3 **Fig. 3.1** shows two plastic cups, one of which was suspended by its handle and both were rubbed with fur.

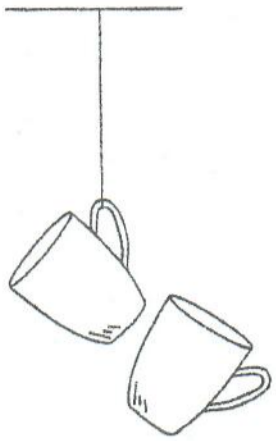


Fig. 3.1

(a) **(i)** State the effect of rubbing the two plastic cups with fur.

_____

_____ [1]

(ii) Show by an arrow the direction in which the suspended cup will move in **Fig. 3.1**. [1]

(iii) Suggest reasons for the direction of movement of the cup.

_____

_____

_____ [2]

(iv) If the suspended cup was momentarily touched and the second cup brought close what would be observed? Explain this observation.

observation_____

_____

explanation_____

_____ [2]

(b) In another experiment a pupil set up apparatus to investigate the conductivity of electricity by water. **Fig 3.2** shows the apparatus which were set up.

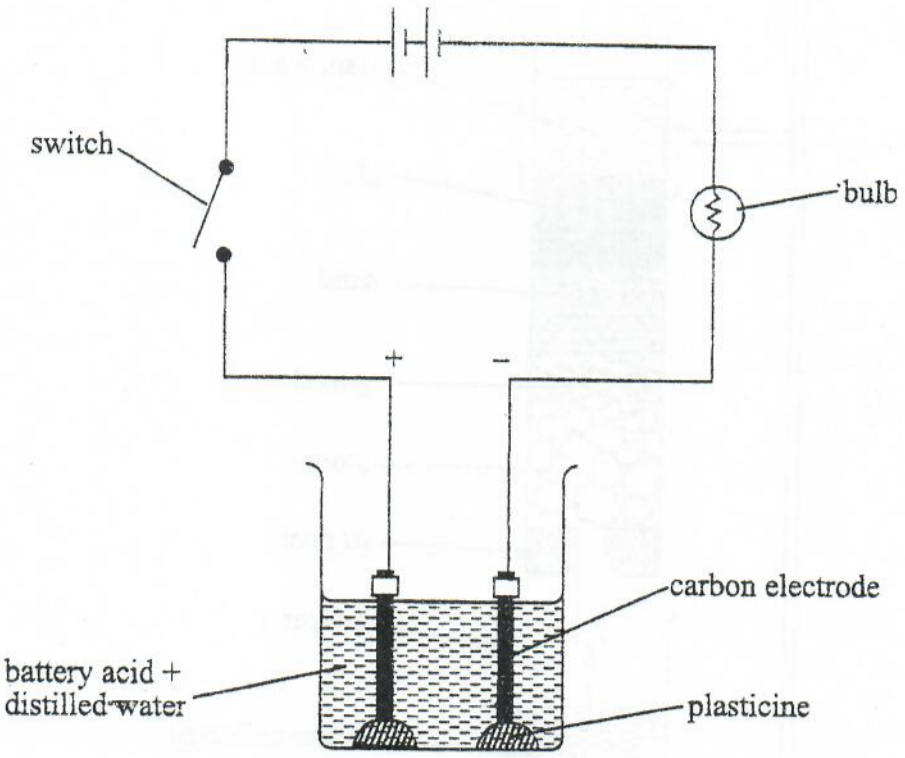


Fig. 3.2

(b) **(i)** Explain why battery acid was added to distilled water.

_____

_____ [1]

(ii) Suggest **two** ways of showing that acidified water conducted electricity in this experiment.

_____

_____

_____ [2]

(iii) Name **one** other substance which the pupil could have added instead of the battery acid.

_____ [1]

[Total: 10]

For Examiner's Use

4 Fig. 4.1 shows apparatus for demonstrating water purification.

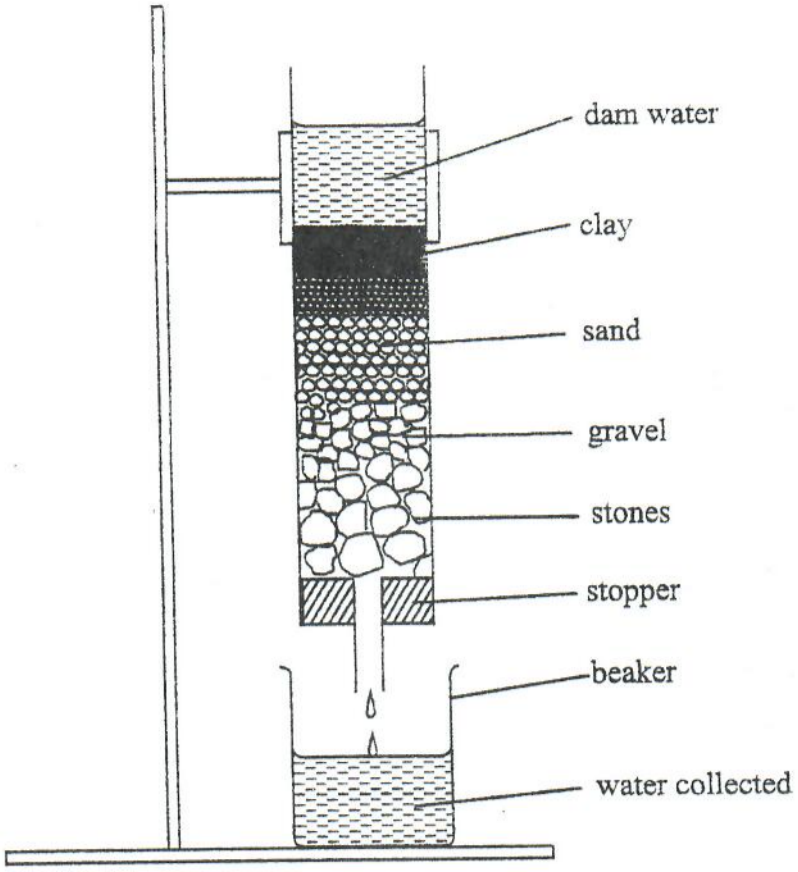


Fig. 4.1

(a) **(i)** Name the method shown.

_____ [1]

(ii) State **one** substance being removed by this method.

_____ [1]

(iii) What makes the water collected not safe?

_____ [1]

(iv) Suggest **two** methods by which you would make it safe for drinking.

_____

_____ [2]

(b) **Fig. 4.2** shows a method used to provide protection from a particular disease.

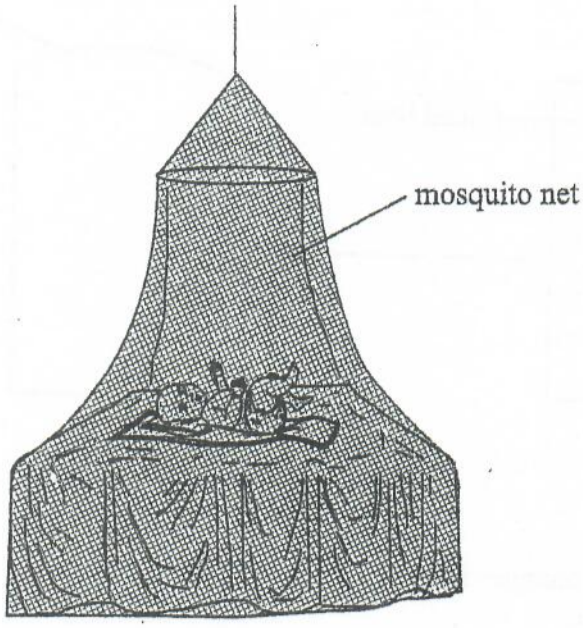


Fig. 4.2

(i) State the purpose of the net.

_____ [1]

(ii) Suggest how the effectiveness of the net can be improved.

_____ [1]

(iii) Name the disease from which the person is protected.

_____ [1]

(c) In food preservation, one of the methods used is canning. **Fig. 4.3** shows a change observed in a tin of canned beef.

For Examiner's Use

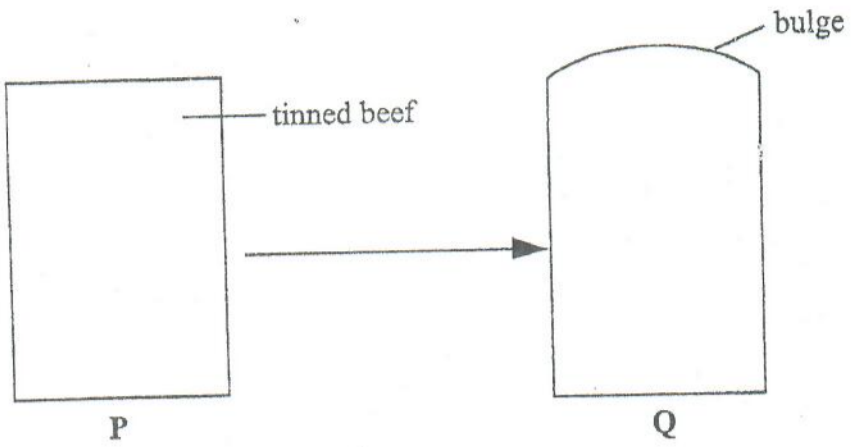


Fig. 4.3

Explain the changes from **P** to **Q** with reference to food preservation.

_____

_____

_____ [2]

[Total: 10]

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

POSSIBLE ANSWERS

JUNE 2008

INTEGRATED SCIENCE **5006/3**

1 (a) (i) To completely exclude air bubbles:
To collect gas; [2]

(ii) Gas collected is mixed with air; [1]

(b) 16.4

(c) (i)

All points correctly plotted;
All points correctly joined from origin; [2]

(ii) In X rate is lower;
In Y rate is higher
OR
Both the reactions are faster at the beginning; and slow down after 2 minutes; [2]

(d) Catalyst; [1]

(e) Use powdered zinc/increase concentration of acid/heating; [1]

2 (a) (i) Welding; [1]

(ii) Heat melts plastic rod and beam;
Molten plastic fuses on cooling; forming air tight joint; [2]

(b) (i) Bricks hung or placed on beam; one at a time;
Number of bricks that will cause the beam to break/snap found; [3]

(ii) Compression: arrow on top of beam E towards joint;
arrow on top of beam F towards joint;

Tension: arrow under beam E away from joint;
Arrow under beam & away from joint;

[3]

(c) No effect/no change in strength; [1]

Total [10]

3 (a) (i) become charged; [1]

(ii) the suspended moves away from the other cup; [1]

(iii) cups acquire similar charges;
which repelled each other [2]

(iv) suspends cup will swing towards the other cup; [1]

touching discharged the suspended cup/the other cup induces charge in suspended cup; resulting in attraction; [2]

(b) (i) to enhance ionisation/dissociation of ions/
to make water a conductor; [1]

(ii) lighting/glowing of the bulb;
bubbles/effervescence at the electrodes/battery carbons; [2]

(iii) names salt; for example sodium chloride; (which acts as electrolyte)
OR hydrochloric acid/lemon juice [1]

Total [10]

4 (a) (i) filtration; [1]

(ii) suspended particles/leaves; [1]

(iii) bacteria/microorganism/dissolved toxins; [1]

(iv) boiling; chlorination/adding Jik; [2]

(b) (i) prevent mosquito bites; [1]

(ii) treatment of net with insecticide/icoanet/mosbar; [1]

(iii) malaria; [1]

(c) bacterial activity;
gases produced;
gas pressure; [2]

Total [10]

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

INTEGRATED SCIENCE

5006/1

PAPER 1 Multiple Choice

NOVEMBER 2008 SESSION

1 hour

Additional materials:
- Multiple Choice answer sheet
- Soft clean eraser
- Soft pencil (type B or HB is recommended)

TIME 1 hour

INSTRUCTIONS TO CANDIDATES

Do not open this booklet until you are told to do so.
Write your name, Centre number and candidate number on the answer sheet in the spaces provided unless this has already been done for you.

There are **forty** questions in this paper. Answer **all** questions. For each question there are four possible answers, **A, B, C** and **D**. Choose the **one** you consider correct and record your choice in **soft pencil** on the separate answer sheet.

Read very carefully the instructions on the answer sheet.

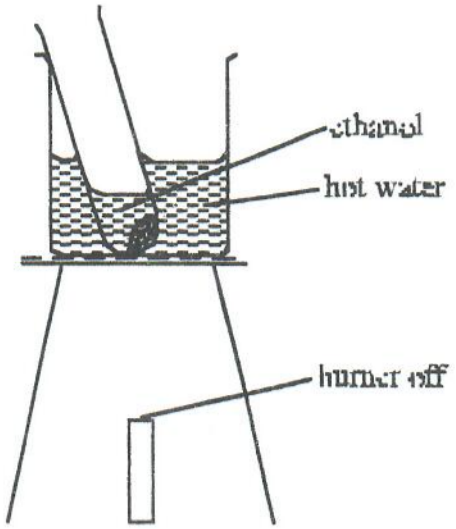
INFORMATION FOR CANDIDATES

Each correct answer will score one mark. A mark will not be deducted for a wrong answer. Any rough working should be done in this booklet.

This question paper consists of 17 printed pages and 3 blank pages.

[Turn over

1 The diagram shows one of the stages in the test for starch in a leaf.

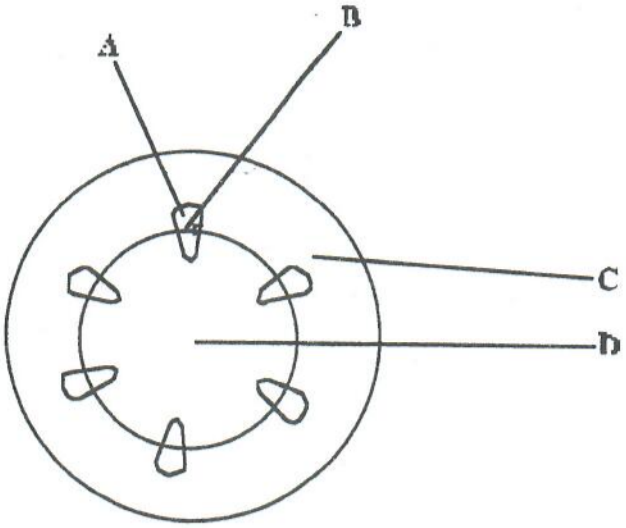


Why is the burner turned off?

A Heat will cause water to evaporate.
B Heat will cause ethanol to breakdown.
C Ethanol is highly flammable.
D Boiling water will spurt out.

2 The diagram shows a cross section of a stem.

Which part is necessary for the passage of water and dissolved mineral salts?

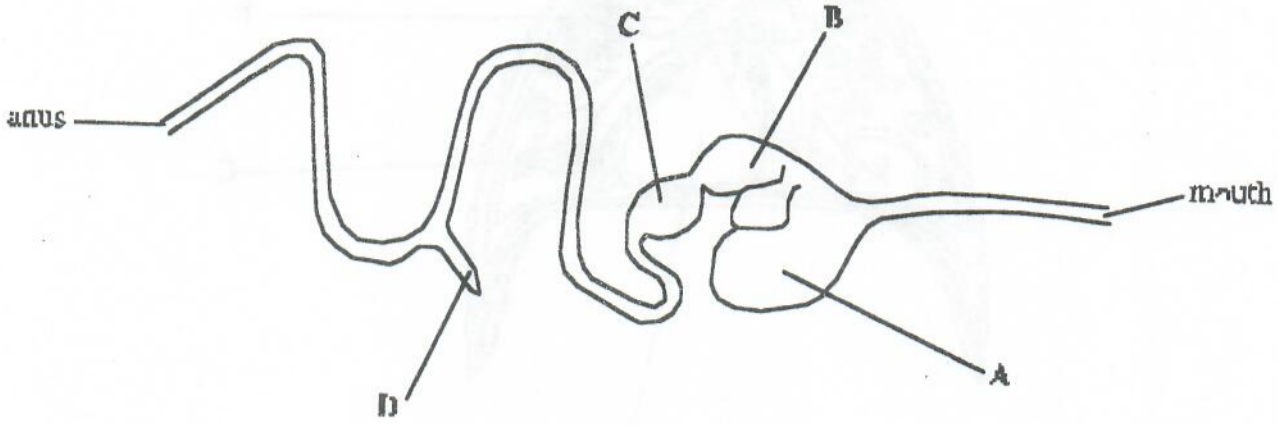


3 Which signs show lack of potassium in plants?

A small, yellow leaves, poor roots
B tall, thin plant with purplish leaves
C poor flowering and yellow brown leaf margins
D poor root growth and stunted growth

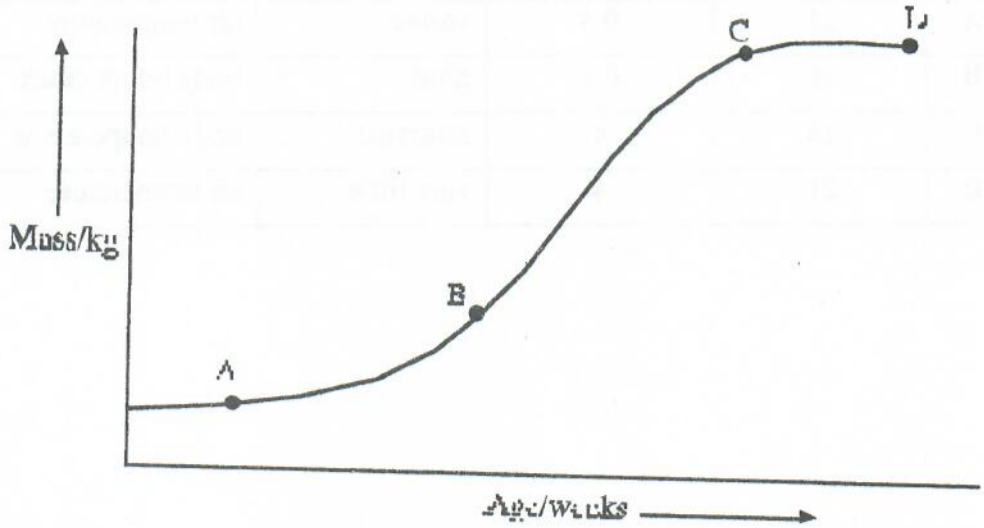
4 The diagram shows the digestive system of a ruminant.

Which part is the omasum?

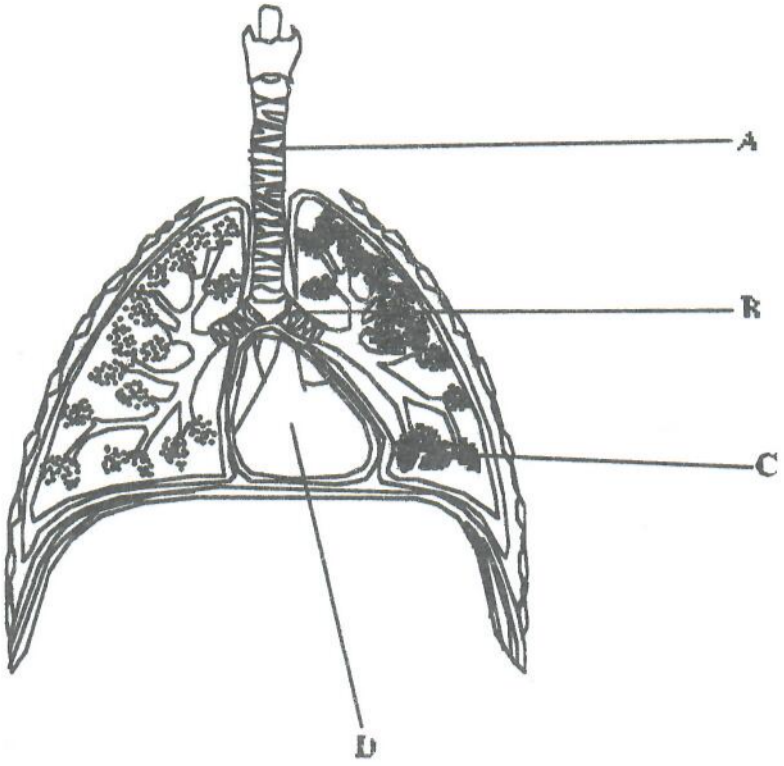


5 The graph shows a generalised growth curve for broiler chicken.

At which stage would it be best to slaughter the chicken?



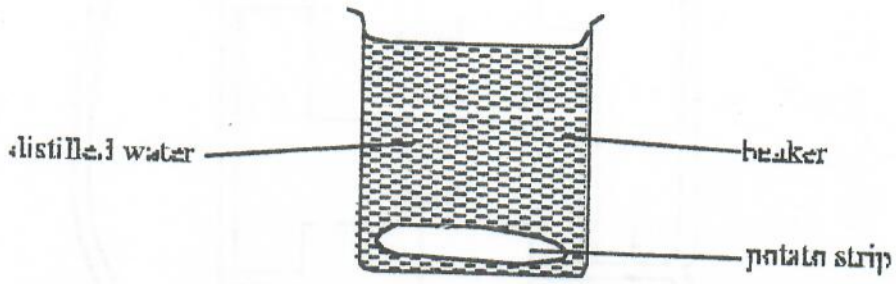
6 The diagram shows the human respiratory system. Which part, if damaged would lead to emphysema?



7 Which is the correct description of expired air in the table below?

	oxygen (%)	carbon dioxide (%)	water vapour	temperature
A	21	0.4	varies	air temperature
B	16	0.4	none	body temperature
C	16	4	saturated	body temperature
D	21	4	very little	air temperature

8 The diagram shows an experiment on osmosis.



What happens to the potato strip after one hour?

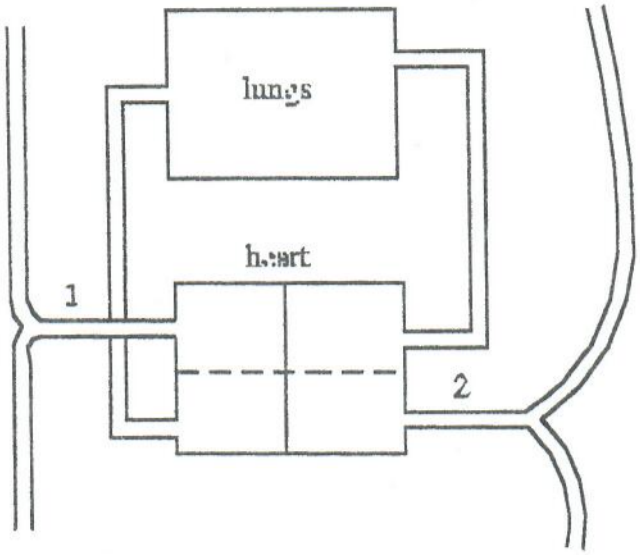
A Cells lose water and become plasmolysed.
B Cells take in water and become plasmolysed.
C Cells lose water and become turgid.
D Cells take in water and become turgid.

9 The table shows factors which affect transpiration.

Which set of conditions would reduce the rate of transpiration?

	air movement	light intensity	humidy	temperature
A	low	high	low	high
B	high	low	high	low
C	high	high	low	high
D	low	low	high	low

10 The diagram represents part of the human circulatory system.



What are blood vessels **1** and **2**?

	1	2
A	pulmonary artery	pulmonary vein
B	hepatic vein	hepatic artery
C	vena cava	aorta
D	hepatic portal vein	pulmonary artery

11 75 bean seeds were sown and 25 germinated.

The percentage germination was approximately

A 25%.
B 33%.
C 43%.
D 75%.

12 What is the advantage and disadvantage of vegetative reproduction?

	advantage	**disadvantage**
A	better chance of survival	reduces resistance to disease
B	can be genetically improved	reduced chance of survival
C	many plants obtained quickly	lack of genetic variation
D	favourable characteristics retained	few plants obtained quickly

13 What causes variation in living organisms?

A environmental factors and natural selection
B genetic factors and artificial selection
C environmental and genetic factors
D natural and artificial selection

14 What are some undesirable effects of human activities on the ecosystems?

A increased bio-diversity and desertification
B low bio-diversity and desertification
C desertification and unpolluted environment
D reduced pollution and low bio-diversity

15 The equation shows a change of state.

iodine crystals $\rightleftharpoons$ iodine gas

What is this change?

A condensation
B melting
C evaporation
D sublimation

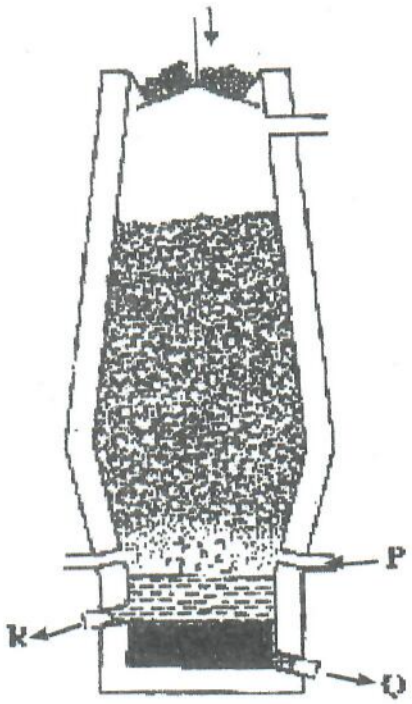
16 The equation shows a chemical reaction.

acid + base → **P** + **Q**

What are the products **P** and **Q**?

A salt and water
B hydroxide and water
C hydrogen and salt
D salt and oxygen

17 The diagram shows the blast furnace.



What substances enter or leave through **P**, **Q** and **R**?

	P	Q	R
A	coke	iron	slag
B	iron	slag	hot air
C	hot air	iron	slag
D	hot air	coke	iron

18 Which factors increase the speed of a chemical reaction?

A low temperature, high concentration, catalyst
B catalyst, high temperature, low concentration
C low concentration, catalysts, low temperature
D high temperature, high concentration, catalyst

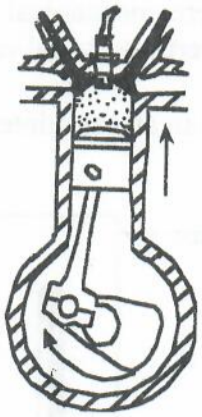
19 Which statement is correct about corrosion of metals?

A Copper corrodes more rapidly than magnesium.
B Aluminium corrodes less rapidly than iron.
C Lead corrodes more rapidly than zinc.
D Copper corrodes less rapidly than iron.

20 Which catalysts are used in the manufacture of nitric acid and in the Haber process?

	nitric acid production	Haber process
A	iron	rhodium and platinum
B	rhodium and platinum	vanadium (V) oxide
C	rhodium and platinum	iron
D	vanadium (V) oxide	iron

21 The diagram shows part of an engine cylinder.



What type of engine and what stroke are shown?

	engine	stroke
A	diesel	power
B	petrol	compression
C	petrol	exhaust
D	diesel	intake

22 The diagram shows part of a circuit.

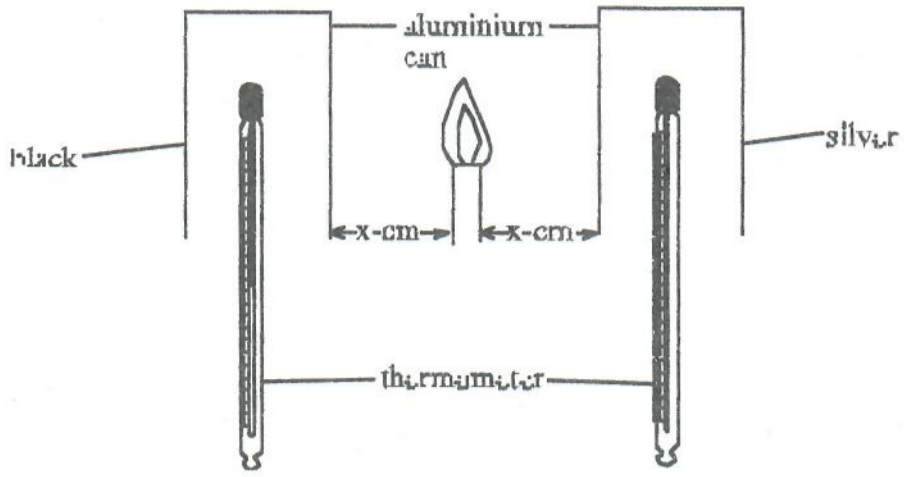
What is the total resistance?

A 2.5 Ω
B 5.0 Ω
C 10.0 Ω
D 25.0 Ω

23 What is correct about an electric motor?

A has a slip ring and converts electrical energy to mechanical energy
B has a split ring and converts mechanical energy to electrical energy
C has a slip ring and converts mechanical energy to electrical energy
D has a split ring and converts electrical energy to mechanical energy

24 The apparatus shown were used in an experiment to compare heat absorption by different coloured surfaces.



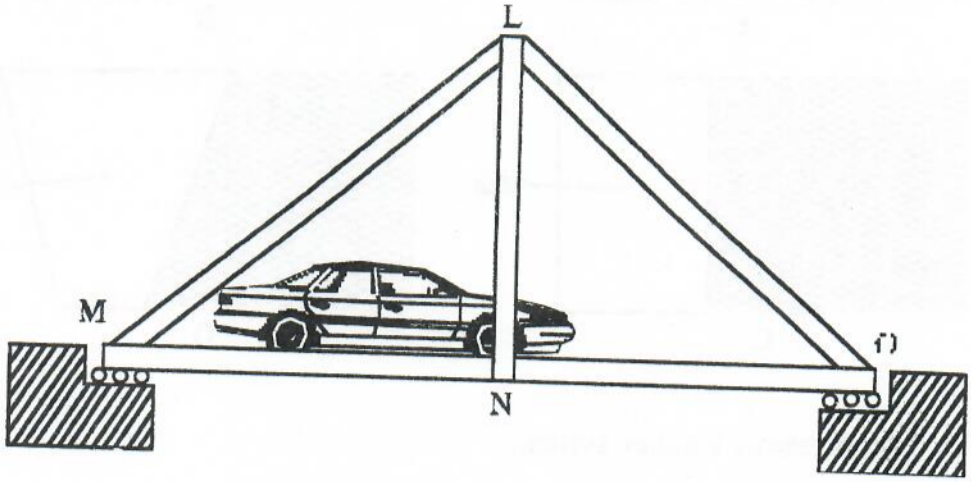
What is the conclusion to the experiment?

A Black surfaces are good heat radiators.
B Shiny surfaces are good heat absorbers.
C Black surfaces are good heat absorbers.
D Shiny surfaces are good heat radiators.

25 Which statement is correct about an I-beam?

A It uses more material than a solid beam.
B It is weaker than a solid beam.
C It is heavier than a solid beam.
D It is as strong as a solid beam.

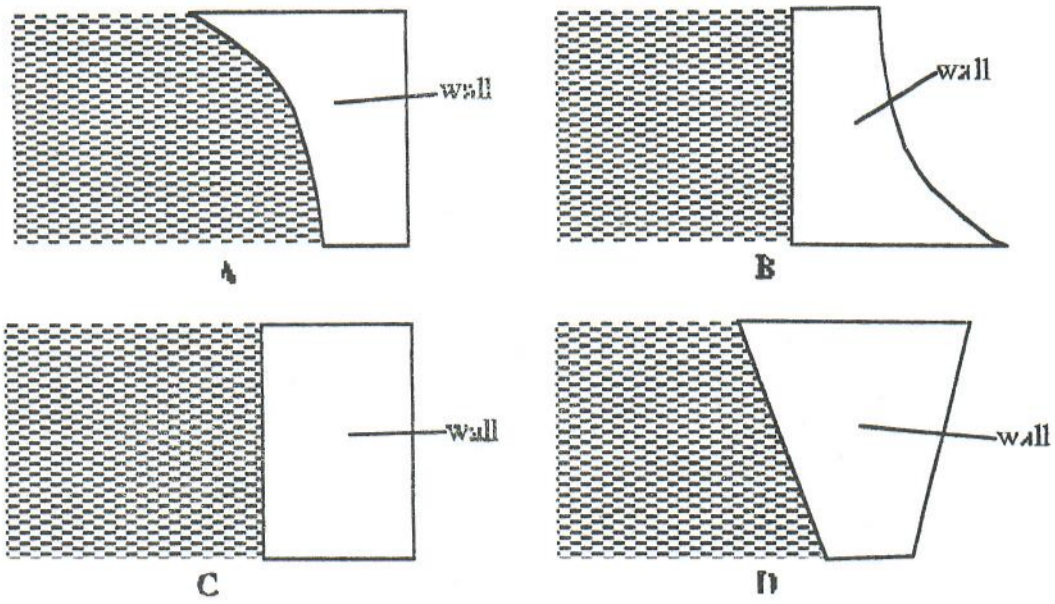
26 The diagram shows a car at a bridge with a truss.



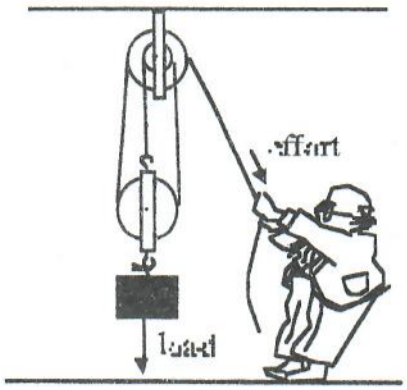
On the truss, identify the strut and tie.

	strut	tie
A	LN	ML
B	LM	LN
C	LO	LM
D	MN	LN

27 Which diagram correctly shows the shape of a dam wall?



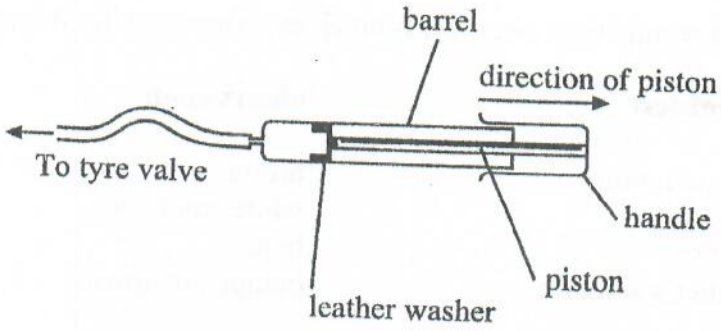
28 The diagram shows a pulley system.



What is the velocity ratio?

A 1
B 2
C 3
B 4

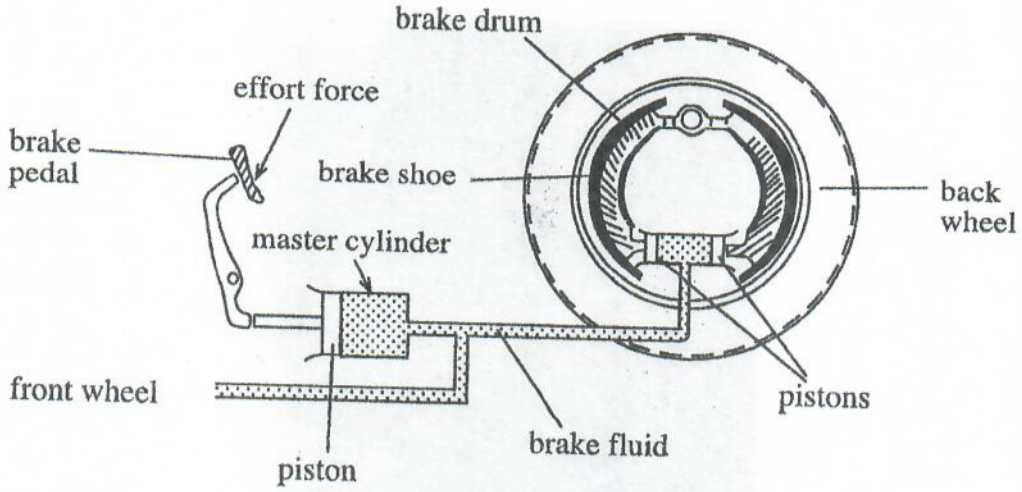
29 The diagram shows a bicycle pump connected to a tyre.



What happens when the piston is pulled in the direction shown?

A Pressure inside barrel increases.
B Leather washer forms an air tight seal with the barrel.
C Air enters the tyre valve.
D Air rushes into the barrel.

30 The diagram shows a car braking system.



When the foot pedal is pushed

1 the brake pads are pressed against the wheels,
2 the piston in the master cylinder exerts a force on the brake fluid,
3 the car slows down and stops,
4 the resulting pressure is transmitted to the other pistons.

Which is the correct order of the events?

A	3	1	4	2
B	4	3	2	1
C	1	2	3	4
D	2	4	1	3

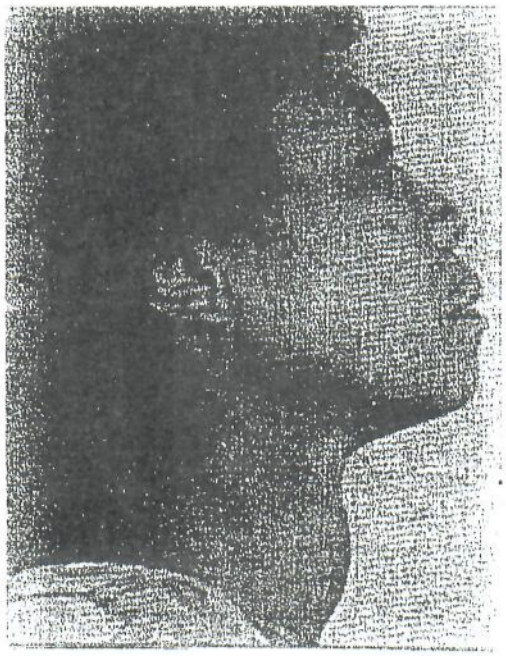
31 The following results were obtained from an experiment on food tests.

reagent/test	observation
iodine solution	brown
ethanol	white emulsion
Biuret test	blue
Benedict's solution	orange precipitate

Which nutrients were present?

A reducing sugars and starch
B fat and reducing sugars
C starch and proteins
D fat and proteins

32 The photograph shows a woman whose diet lacks a certain nutrient.



Name the deficient nutrient.

A vitamin A
B iron
C iodine
D vitamin D

33 Babies born to smoking mothers are likely to have

A kwarshiokor.
B marasmus.
C scurvy.
D low weight.

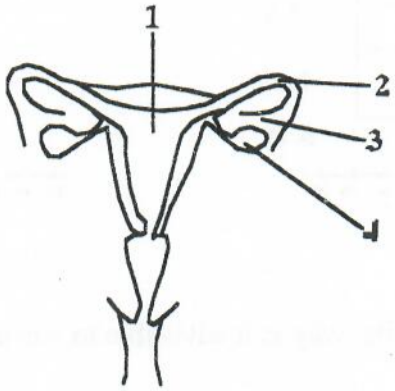
34 Which method of food preservation does not kill bacteria?

A sugaring
B canning
C refrigeration
D salting

35 Which list has an example of a vector, a pathogen and a symptom?

	vector	**pathogen**	**symptom**
A	plasmodium	mosquito	rash
B	mosquito	plasmodium	headache
C	plasmodium	mosquito	headache
B	mosquito	plasmodium	rash

Questions36 and 37 refer to the diagram of the female reproductive system.



36 Which is the correct ovum route, beginning with ovulation?

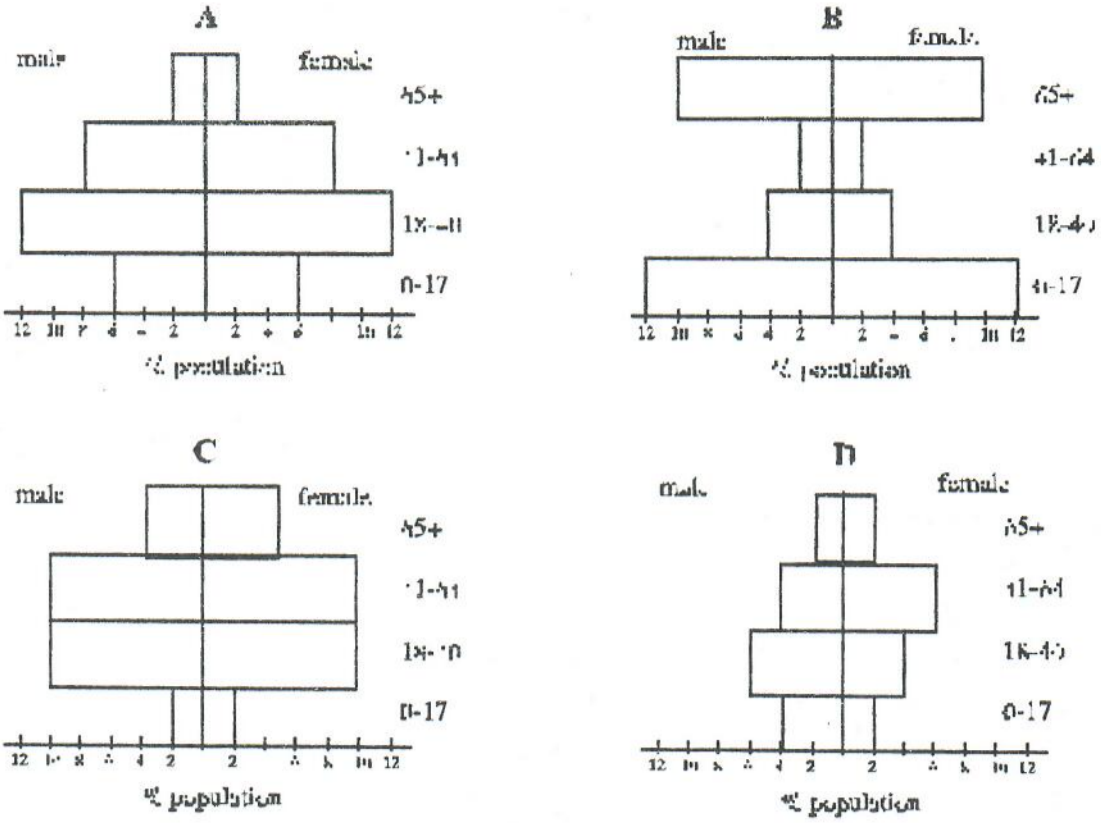
A	4	3	2	1
B	1	2	3	4
C	2	1	3	4
D	3	4	1	2

37 Which part can be damaged by sexually transmitted infections and cause sterility?

A 1
B 2
C 3
D 4

38 The graphs show population of four countries.

Which country has the highest dependency ratio?



39 In an area with sandy soils, why is it advisable to site a toilet on the downward slope in relation to the well?

A to prevent water filling the toilet
B to prevent rodents entering the well
C to prevent bad smell getting to the well
D to prevent seepage into the well

40 Which is the final stage of purifying dam water for a small town?

A settling
B filtration
C flocculation
D chlorination

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

POSSIBLE ANSWERS

NOVEMBER 2008

INTEGRATED SCIENCE **5006/1**

INTEGRATED SCIENCE – 5006/01 – NOVEMBER 2008

SUGGESTED ANSWERS

1.	C	21.	B
2.	B	22.	C
3.	C	23.	D
4.	B	24.	C
5.	C	25.	D
6.	C	26.	B
7.	C	27.	B
8.	D	28.	C
9.	D	29.	D
10.	C	30.	D
11.	B	31.	B
12.	C	32.	C
13.	C	33.	D
14.	B	34.	C
15.	D	35.	B
16.	A	36.	A
17.	C	37.	B
18.	D	38.	B
19.	D	39.	D
20.	C	40.	D

Candidate Name | Centre Number | Candidate Number

0127655

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

INTEGRATED SCIENCE

PAPER 2

5006/2

NOVEMBER 2008 SESSION

2 hours

Additional materials:
Answer paper

TIME 2 hours

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page and on all separate answer paper used.

Section A

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

Section B

Answer **all** questions.

Write your answers on the separate answer paper provided.

At the end of the examination, fasten the separate answer paper securely to the question paper.

INFORMATION FOR CANDIDATES

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

You are advised to spend no longer than 45 minutes on Section A and 1 hour 15 minutes on Section B.

FOR EXAMINER'S USE	
Section A	
Section B	
6	
7	
8	
9	
10	
TOTAL	

This question paper consists of 9 printed pages and 3 blank pages.

[Turn over

For Examiner's Use

Section A

*Answer **all** questions in this section in the spaces provided.*

You are advised to spend no longer than 45 minutes on this section.

1 (a) A piece of potato in **Fig. 1** was placed in concentrated salt solution for some hours. Afterwards the piece of potato was observed to be soft.

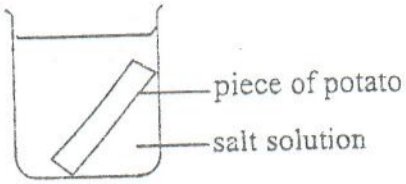


Fig. 1

(i) Name the process that could have caused the potato to soften.

_____ [1]

(ii) Describe the process named in **(a)(i)**.

_____

_____

_____

_____ [3]

(b) If too much fertiliser is added to a field, the crops wither and die. Use the results in **(a)** to explain this observation.

_____

_____

_____

_____

_____ [4]

[Total:8]

For Examiner's Use

2 Fig. 2 shows an experiment to heat an iodine crystal in a fume cupboard or near an open window.

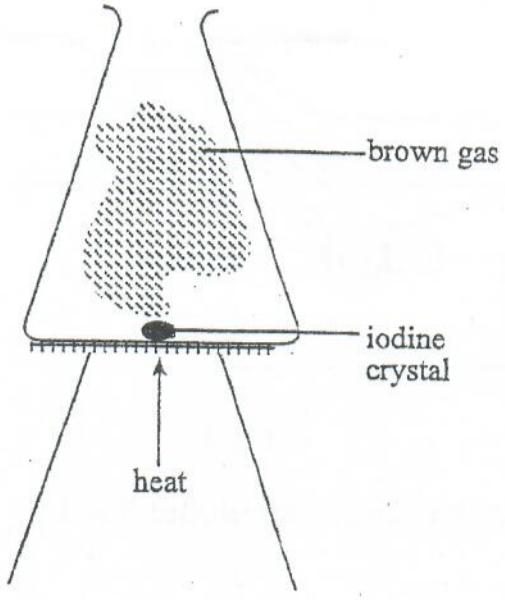


Fig. 2

(a) Why is the experiment done in a fume cupboard or near an open window?

_____

_____ [2]

(b) (i) Name and describe the change of state taking place in Fig. 2.

_____

_____ [2]

(ii) Explain the change in (b)(i) in terms of arrangement of particles and energy of particles.

_____

_____

_____

_____ [4]

[Total: 8]

3 Fig. 3 shows a d.c. electric motor.

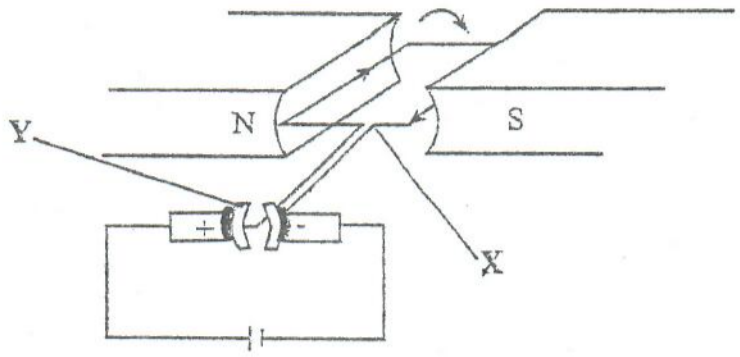


Fig. 3

(a) (i) Name the components labelled X and Y.

X _____

Y _____ [2]

(ii) State the energy conversion in an electric motor.

_____ [2]

(b) Suggest **two** situations in which electric motors are used.

_____

_____

_____ [2]

(c) Calculate the current drawn by an electric motor rated at 125 W when it is run on a d.c. supply of 25 V.

current = _____ [2]

[Total: 8]

For Examiner's Use

4 A model of a hydraulic jack of velocity ratio 100 and mechanical advantage of 50 is used to lift a toy car.

(a) (i) Calculate the efficiency of the jack.

_____

_____

_____ [2]

(ii) Explain why the efficiency is not 100%.

_____

_____

_____ [2]

(b) The hydraulic jack relies on the transmission of pressure in liquids.

(i) Define *pressure*.

_____

_____ [1]

(ii) State **three** advantages of using oil in the hydraulic jack.

_____

_____ [3]

[Total: 8]

For Examiner's Use

5 (a) Describe the functions of the following blood components.

1. white blood cells,

_____

_____

_____ [2]

2. platelets,

_____

_____ [1]

3. red blood cells.

_____

_____ [1]

(b) State **two** types of immunity.

_____ [2]

(c) A homestead uses bush toilet instead of a Blair pit latrine. Suggest the possible dangers of such a practice.

_____

_____ [2]

[Total: 8]

Section B

*Answer **all** questions on the separate answer paper provided.*

6 Water loss from a maize plant was measured over a 24-hour period as shown in Table 1.

Table 1: Measurement of water loss from a maize plant

Time period (24 hours)	Water loss (cm^3)
0500 – 0700	13
0700 – 0900	91
0900 – 1100	160
1100 – 1300	218
1300 – 1500	248
1500 – 1700	195
1700 – 1900	179
1900 – 2100	124
2100 – 2300	28
2300 – 0100	18
0100 – 0300	18
0300 – 0500	13

(a) Using the table above, identify with reasons, periods during which water loss is highest and lowest. [9]

(b) Describe ways in which plants are adapted to reduce water loss. [3]

[Total: 12]

7 Iron pyrites is used as a source of sulphur dioxide in the manufacture of sulphuric acid in Zimbabwe.

(a) Describe briefly how sulphur trioxide is obtained from iron pyrites. [6]

(b) Describe and explain how sulphur trioxide is converted to sulphuric acid. [6]

[Total: 12]

8 **Fig. 4** shows four strokes of a petrol engine.

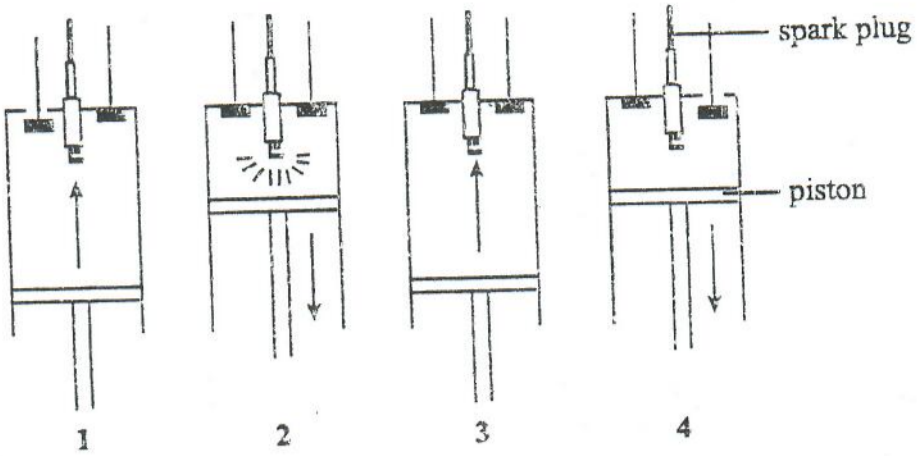


Fig. 4

(a) Describe what happens at each numbered stroke shown in **Fig. 4**. [8]

(b) When petrol burns in the cylinders, only about a quarter of the energy is used to turn the wheels of the car. Describe what happens to the rest of the energy. [4]

[Total: 12]

9 **Fig. 5** shows a U-tube manometer used to measure gas pressure.

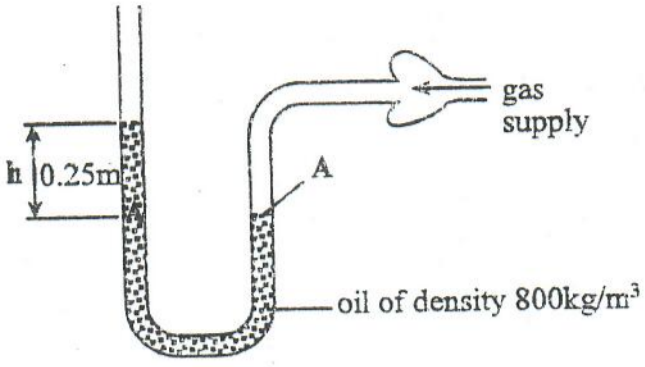


Fig. 5

(a) Describe how the manometer is used to measure gas pressure. [6]

(b) Calculate the pressure at A due to liquid column h. ($g = 10ms^{-2}$) [2]

(c) Wind pressure of 300 N/m^2 acts on a wall 10 m by 2m. Calculate the force of the wind. [4]

[Total: 12]

10 Tendai and Themba were brought to a clinic by their mother. The children had the following symptoms:

Tendai: His skin is cracked and scaly, the abdomen is swollen and his hair has a reddish colour.

Themba: He is drowsy and has sunken eyes, a dry tongue and does not produce tears when crying. Excessive thirst.

(a) (i) Identify the possible diseases affecting each child and their causes. [4]

(ii) To one of the children the doctor prescribes Oral Rehydration Treatment (ORT). Describe how the ORT is prepared and give its effect. [5]

(b) State **three** ways in which pathogens are transmitted. [3]

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ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

POSSIBLE ANSWERS

NOVEMBER 2008

INTEGRATED SCIENCE 5006/2

1 (a) (i) Osmosis; (1)

(ii) Movement of water molecules; from a region of their high concentration; through a semi-permeable membrane; (3)

(b) More water in plant tissues/cells; than in soil; water moves from plant cells; into the soil; (4)

Total [8]

2 (a) iodine vapour produced; toxic; (2)

(b) (i) sublimation; solid; → gas; (2)

(ii) Particles in crystal: closely packed; little kinetic energy; vibrate in fixed positions; (2)

Particles in gas: Far apart; move freely; more kinetic energy; One of the points must have something to do with energy on each part. (2)

Total [8]

3 (a) (i) X – coil; Y – commutator/split rings; (2)

(ii) electrical; → mechanical/kinetic; (2)

(b) grinding mills; lawn mowers; fans; trains; water pumps; any correct situation is accepted. (2)

(c) $I = \frac{P/V}{\frac{125}{25}};$

= 5A; The unit has to be correct for the mark to be awarded. (2)

Total [8]

4 (a) (i) Efficiency = $\frac{MA}{VR} / \frac{50}{100};$

= 0.5/

= 50%; (2)

(ii) Energy lost through friction;
Weight of moving parts; (2)

(b) (i) Force per unit area/ $\frac{\text{Force}}{\text{Area}} / \frac{F}{A};$ (1)

(ii) - cannot be easily be compressed;
- pressure applied to it can pass equally in all directions;
- small force converted to big force;
- reduces friction; reduces rusting of components; (3)

Total [8]

5 (a) White blood cells: Antibody production;
Engulfing action; one mark for defence. (2)

Platelets: Blood clotting; (1)

Red blood cells: Oxygen transport; (1)

Total [8]

(b) Natural; Artificial; (2)

(c) Outbreak of cholera/dysentery/Any correct waterborne disease can be accepted;
Contamination of water; (2)

6 (a) Highest: 1300 – 1500 hours; (1)
Lowest: 0300 - 0500/0500 – 0700 hours; (1)

Explanation

Highest: Water loss increases from dawn; till early afternoon;
This is caused by increased light and heat; reduced humidity;
(all of which) increase evaporation of water from the leaves;

Lowest: Water loss slows down; as the temperature drops; light decreases;
and the air becomes less dry; so amount of water which can evaporate reduces; Give a maximum of 4 marks from one section, i.e. the lowest or highest. (7)

(b) fewer pores/stomata on the surface of leaf; leathery leaves/waxy coating on leaves; hairy leaves. Accept any other correct adaptations. (3)

Total [12]

7 (a) Iron pyrites roasted in air/oxygen; to give sulphur dioxide; sulphur Trioxide dioxide reacted with oxygen; to give sulphur monoxide;
Or
Iron pyrites + oxygen; → sulphur dioxide;
Sulphur dioxide + oxygen; ⇌ sulphur trioxide;
Catalyst/Vanadium (v) oxide; temperature 450°C - 500°C; (6)

(b) Sulphur trioxide absorbed in concentrated sulphuric acid; to give oleum;
Oleum is diluted with water/dilute acid; to give concentrated sulphuric acid;
Sulphur trioxide not directly added to water; Mist/droplets form; difficult to condense; (6)

Total [12]

8 (a) 1. Inlet valve closed; exhaust gases out; exhaust valve open; piston moving up;

2. Spark; both values closed;
piston moving down;
(award a maximum of two marks for the description of each numbered stroke)

3. Both valves closed; piston moving up;

4. Inlet valve open; piston moving down; exhaust valve closed;
Petrol/air mixture in; (8)

(b) Lost as heat; because of friction; of moving parts; fuel wasted; (by) incomplete combustion; (any four points) (4)

Total [12]

9 (a) To begin with levels same in both sides; gas supply on; levels change; A falls;
Gas pressure given by difference in levels × density × gravity; +
Atmospheric pressure; (6)

(b) Pressure = density × height × gravity + atmospheric pressure/

= 800 kg/m^3 × 0.25 m × 10 ms^{-2}; + 100 000 pa/atmospheric pressure; (2)

= 2 00 Pa + atmospheric pressure/100 000 Pa/100 200 Pa;

(c) Area = L × W/10 × 2; = 20 m^2;

Force = P × A/300 N/m^2 × 20 m^2;

= 6 000 N; (4)

Total [12]

10 (a) (i) Tendai: Kwashiorkor; lack of protein;
Themba: Cholera; bacteria; (4)

(ii) 6 teaspoons sugar; $\frac{1}{2}$ teaspoon salt;
750 ml of solution; with hot water/boiled water;
Replaces lost fluids/water; (5)

(b) Droplet; contact; contamination of food/water; vectors; any 3 (3)

Total [12]

Candidate Name

Centre Number

Candidate Number

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

INTEGRATED SCIENCE

5006/3

PAPER 3

NOVEMBER 2008 SESSION

1 hour

Candidates answer on the question paper

Additional materials:

Soft pencil (type B or HB is recommended)
Soft clean eraser
Ruler (cm/mm)
Mathematical tables/calculator

Time 1 hour

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page.
Answer **all** questions.
Write your answers in the spaces provided on the question paper.

INFORMATION FOR CANDIDATES

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

FOR EXAMINER'S USE	
1	
2	
3	
4	
TOTAL	

This question paper consists of 10 printed pages and 2 blank pages.

Turn over

For Examiner's Use

1 **Fig. 1.1** shows a candle burning in air under a large beaker to determine the end products.

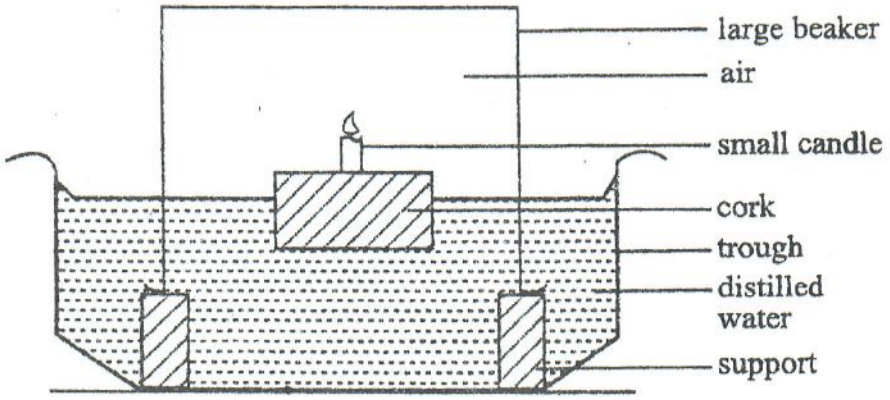


Fig. 1.1

(a) **(i)** Describe what would be observed.

_____

_____ [2]

(ii) Water in the trough was stirred. Suggest a reason for this.

_____ [1]

(iii) Blue litmus paper dipped into the water turned red.

Draw a conclusion from this observation.

_____ [1]

(b) **Fig. 1.2** shows apparatus suitable for finding the percentage of one component in a sample of air. In one of the syringes, 100 cm^3 of air is trapped. The air is passed backwards and forwards over a heated copper rod until no further change occurs.

For Examiner's Use

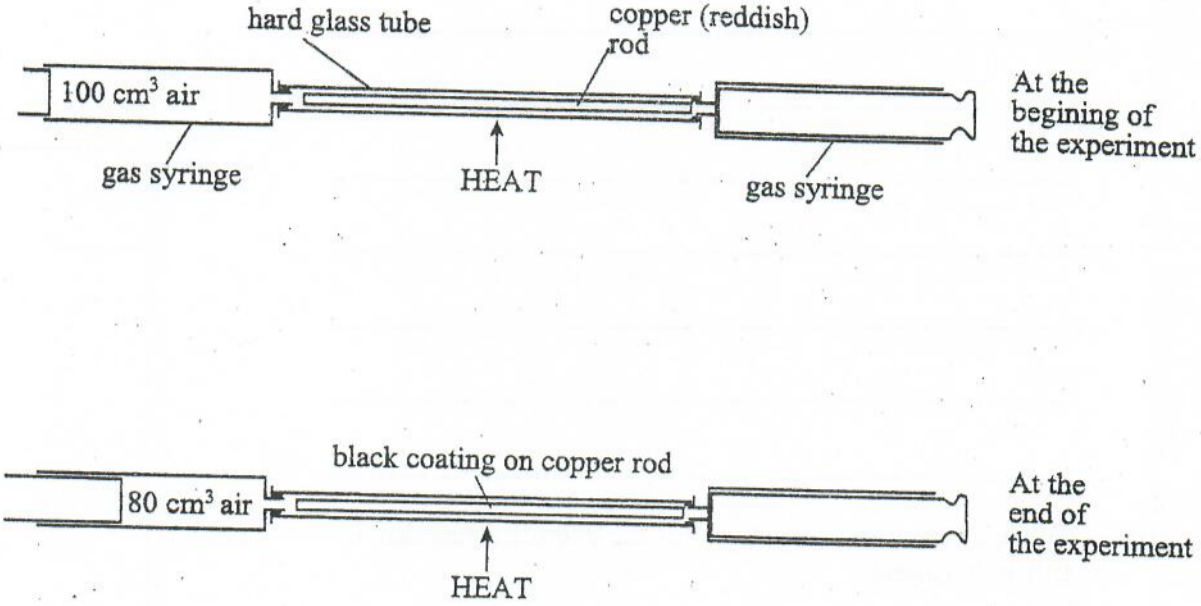


Fig. 1.2

(i) In **Table 1.1** list the differences in **Fig. 1.1**.

Table 1.1

		difference	**at the beginning**	**at the end**
1			100 cm^3 of air	
2				black coating on copper

[2]

For Examiner's Use

(ii) Using the given information, deduce which component of the air is under investigation.

_____

_____

_____

_____

_____

_____

_____

_____ [3]

(iii) Write down a word equation for the chemical reaction in this experiment.

_____

_____ [1]

[Total: 10]

2 **Fig. 2.1** shows an experiment set up to demonstrate convection currents in air.

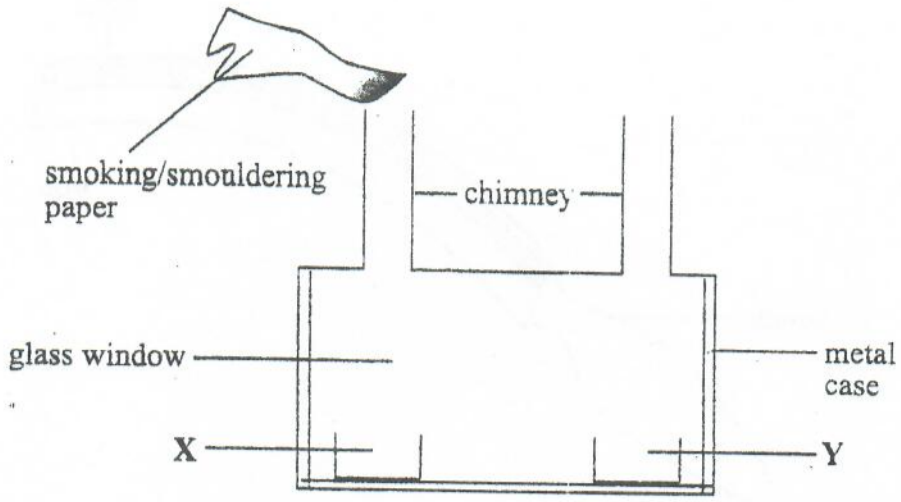


Fig. 2.1

(a) **(i)** In **Fig 2.1** where should the candle be **X** or **Y**?

_____ [1]

(ii) In **Fig. 2.1** indicate by means of arrows the convection currents. [2]

(iii) Suggest the purpose of the smouldering paper.

_____

_____ [1]

(iv) Describe how convection currents are created as the candle burns.

_____

_____ [2]

(b) **Fig. 2.2** shows the results of heating a bimetallic strip made of brass and iron.

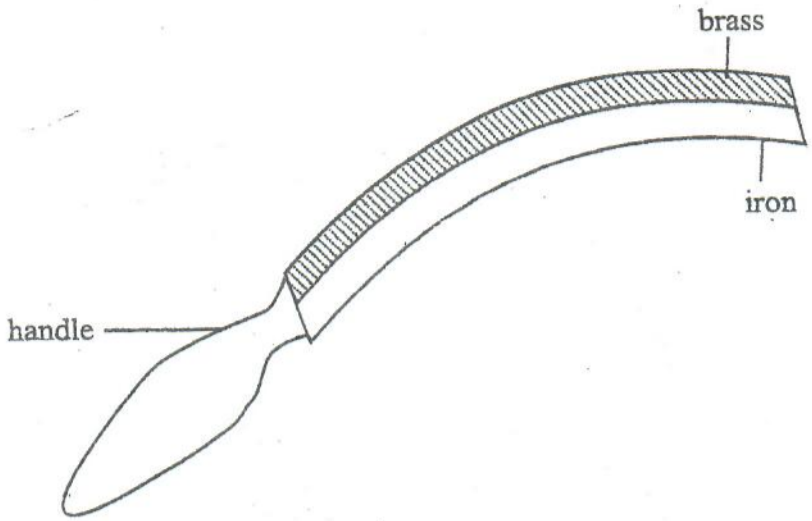


Fig. 2.2

(i) Suggest which metal expands more than the other.

_____ [1]

(ii) Draw a conclusion from the results of this experiment.

_____

_____ [1]

(iii) Draw a diagram showing how the strip would look if it were cooled back to room temperature.

[1]

[Total: 9]

For Examiner's Use

3 **Fig. 3.1** shows a circuit diagram used to show how current changes with voltage.

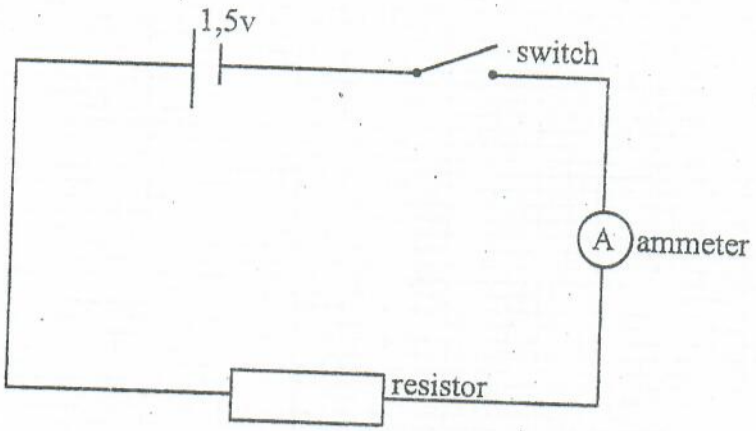


Fig. 3.1

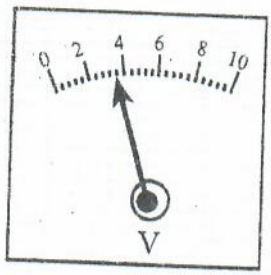


Fig. 3.2

(a) **(i)** Show the position and connection of the voltmeter on **Fig. 3.1**.

[1]

(b) **(i)** **Fig. 3.2** shows the reading on the voltmeter. Use **Fig. 3.2** to complete **Table 3.1**.

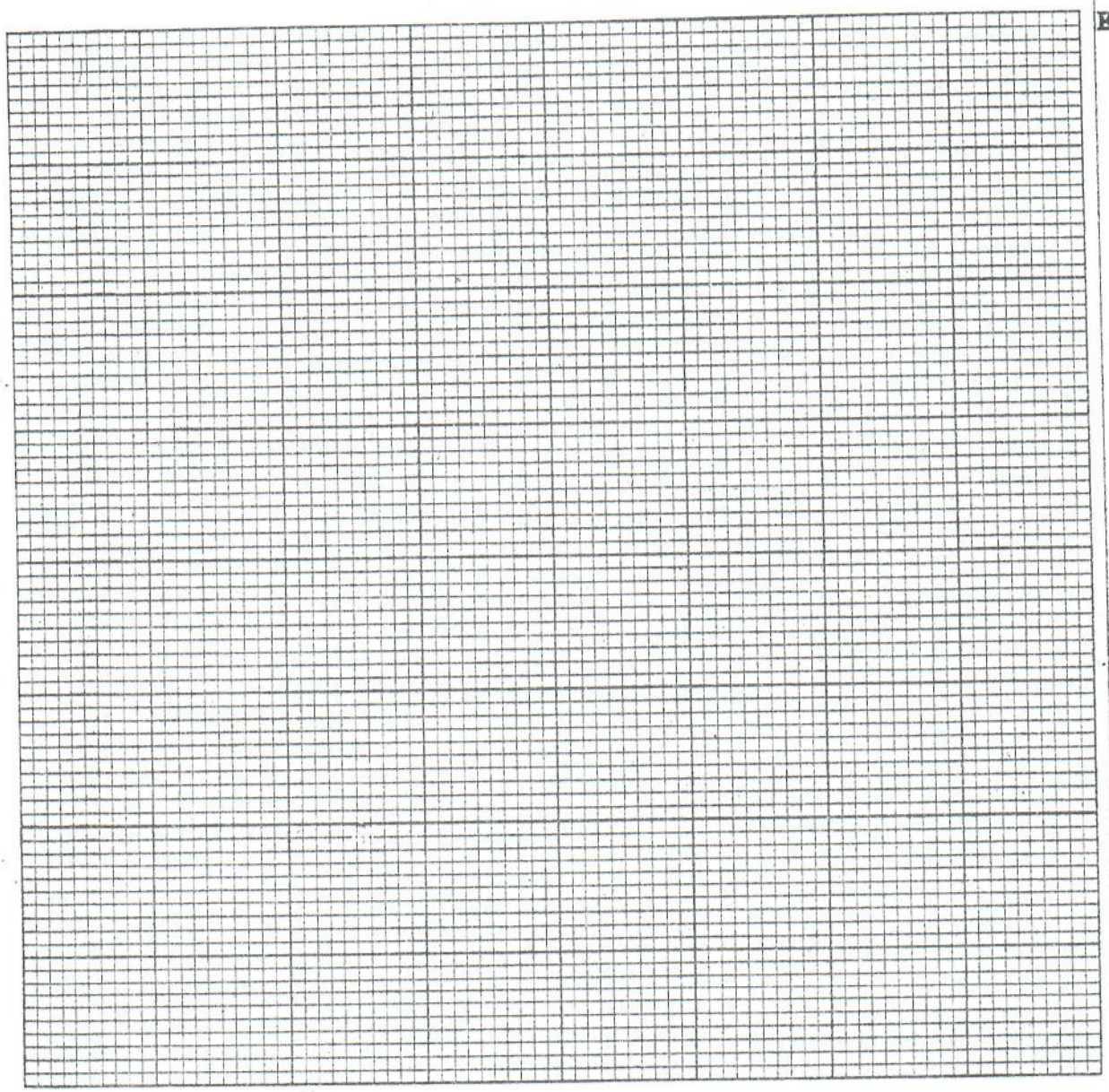
[1]

Table 3.1

voltage/V	1.0	2.0		4.0	5.0	6.0	
current/A	0.1	0.2	0.3	0.4	0.5	0.6	

(ii) Plot a graph of current against voltage on the grid provided.

For Examiner's Use



[3]

(iii) Describe the relationship between current and voltage from the graph.

_____

_____

_____ [2]

For Examiner's Use

(iv) Measure the gradient of the graph to determine the resistance of the resistor.

_____

_____

_____

_____ [3]

[Total : 11]

Fig. 4.1 below shows an adult showing a deficiency symptom.

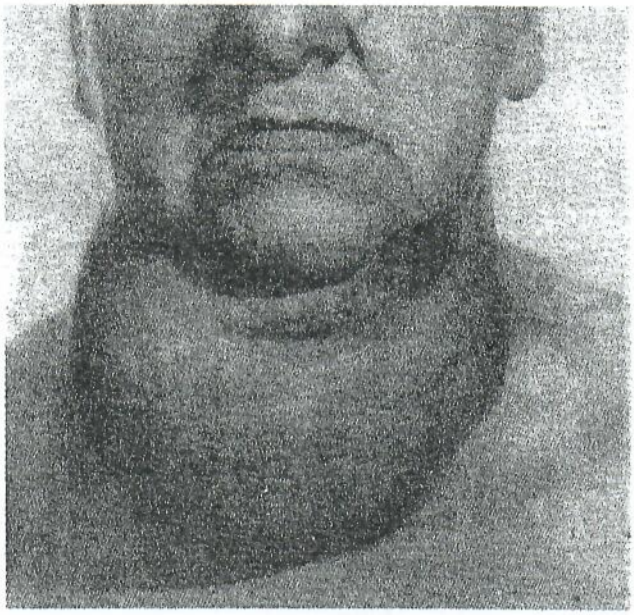


Fig. 4.1

(a) (i) Name the deficiency symptom.

_____ [1]

(ii) Name the specific nutrient absent from the adult's diet.

_____ [1]

For Examiner's Use

(iii) Suggest a source which can provide the adult and child each with the missing nutrient.

_____ [1]

(b) In an investigation to test for protein and reducing sugar, a candidate was provided with the required reagents.

(i) Name the reagents and describe the procedures used to test for:

1. reducing sugar

_____

_____

_____

2. protein

_____

_____

_____ [5]

(ii) **Table 4.1** shows the results obtained

Table 4.1

test for	observation
reducing sugar	blue
proteins	violet

Draw a conclusion from **Table 4.1**

_____

_____

_____ [2]

[Total : 10]

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

POSSIBLE ANSWERS

NOVEMBER 2008

INTEGRATED SCIENCE 5006/3

1 (a) (i) Flame eventually goes out;
Water level in large beaker rises. [2]

(ii) to dissolve soluble products
to evenly distribute the solute;
to mix the carbon dioxide with water. [1]

(iii) Solution formed is acidic [1]

(b) (i)

Difference	At the beginning	At the end
1	volume of air is $100cm^3$;	volume of air $80cm^3$;
2	reddish/brown colour of copper rod	black coating on copper rod;

[2]

(ii) $100\ cm^3 - 80\ cm^3/20\ cm^3$;

$\frac{20}{100} x \frac{100}{1}\%$

$= 20\%$ [2]

The air component is oxygen; [1]

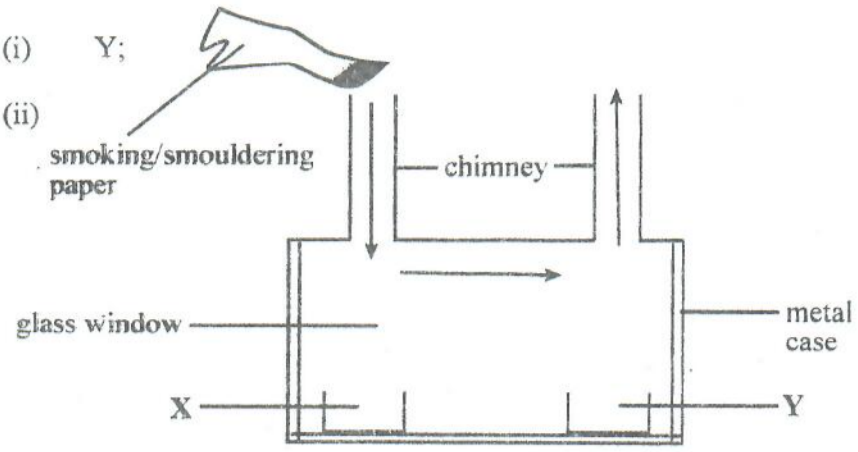
(iii) Copper + oxygen $\xrightarrow{heat}$ copper oxide/

$Cu + O_2 \xrightarrow{heat} CuO_2$; [1]

Total [10]

2 (a) (i) Y; [1]

(ii)



[2]

(iii) to produce smoke; [1]

(iv) air above the candle is heated and it rises; this creates a partial vacuum; which is filled in by cold air which flows into the smoke apparatus; [2]

(b) (i) brass; [1]

(ii) different metals expand at different rates; [2]

(iii)

[1]

Total [10]

3 (a) Voltmeter connected in parallel to the resistor; [1]

(b) (i)

Voltage/V	1.0	2.0	3.6;	4.0	5.0	6.0
Current/A	0.1	02.	0.3	0.4	0.5	0.6

[1]

(ii)

Plotting all points correctly;
Joining all points by a line;
Uniform axes which utilise most of the graph space
Labelling the axes; [3]

(ii) As voltage increases current also increases; in direct proportion/ voltage α current/V α I; [2]

(iii) Gradient = 2v/0,2A =10;
Resistance = 10 ohms; [3]

Total [10]

4 (a) (i) goitre; [1]

(ii) iodine; [1]

(iii) iodised salt, sea food, iodated salt; [1]

(b) (i) Benedict's solution; Add to dissolved food then warm or heat gently in a water bath;

(ii) Sodium hydroxide; and copper sulphate solution; Add to dissolved food and mix; [5]

(iii) simple sugars absent;
proteins present; [2]

Total [10]

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

INTEGRATED SCIENCE

PAPER 1 Multiple Choice

5006/1

JUNE 2009 SESSION

1 hour

Additional materials:
- Multiple Choice answer sheet
- Soft clean eraser
- Soft pencil (type B or HB is recommended)

TIME 1 hour

INSTRUCTIONS TO CANDIDATES

Do not open this booklet until you are told to do so.
Write your name, Centre number and candidate number on the answer sheet in the spaces provided unless this has already been done for you.

There are **forty** questions in this paper. Answer **all** questions. For each question there are four possible answers, **A, B, C** and **D**. Choose the **one** you consider correct and record your choice in **soft pencil** on the separate answer sheet.

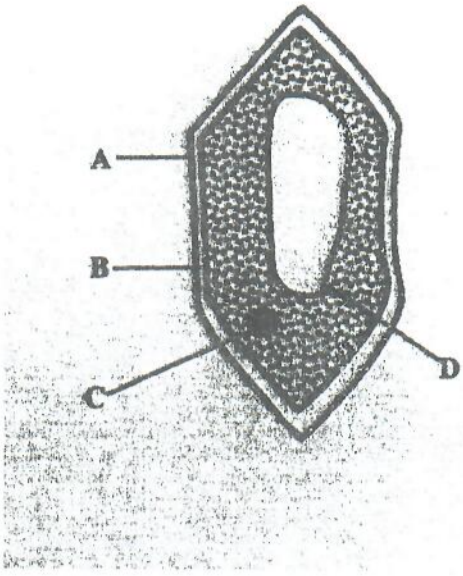
Read very carefully the instructions on the answer sheet.

INFORMATION FOR CANDIDATES

Each correct answer will score one mark. A mark will not be deducted for a wrong answer. Any rough working should be done in this booklet.

This question paper consists of 13 printed pages and 3 blank pages.

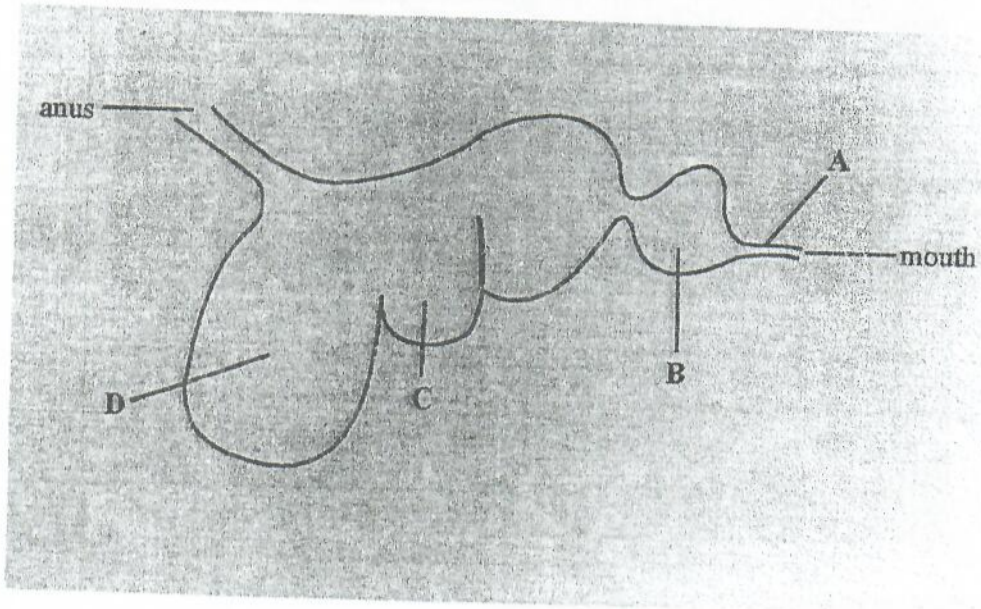
1 The diagram shows a plant cell. Which labelled part is responsible for controlling movement of substances in and out of the cell?



2 Which is the correct equation for photosynthesis?

A glucose + water → oxygen + energy + carbon dioxide
B carbon + oxygen → glucose + water + energy
C water + carbon dioxide → glucose + oxygen
D energy + water + carbon dioxide → glucose + oxygen

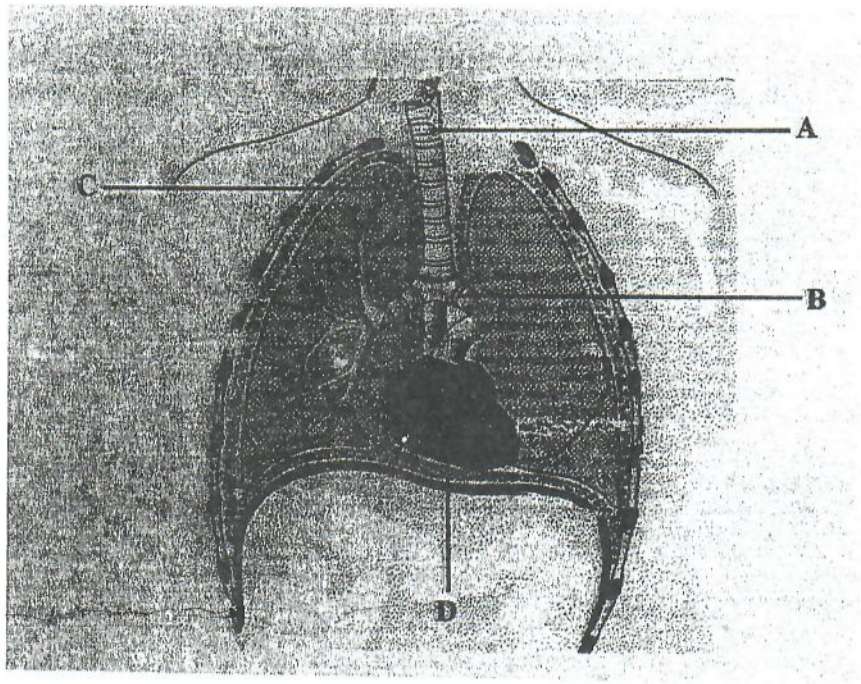
3 The diagram shows part of the digestive system of a ruminant. Which part is the abomasum?



4 Which is the correct function of vitamins and mineral salts?

A provide energy
B growth and repair
C protection against disease
D energy and repair

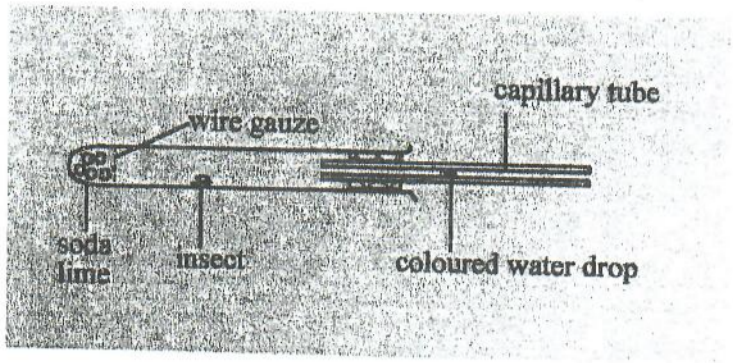
5 The diagram represents the human respiratory system. Where does gaseous exchange take place?



6 Which statement best describes exhaled air?

A more oxygen, less carbon dioxide, cooler
B less oxygen, more carbon dioxide, warmer
C less oxygen, less carbon dioxide, cooler
D more oxygen, more carbon dioxide, warmer

7 The diagram shows an experiment on respiration.



What is the function of the soda lime?

A absorbs oxygen
B releases carbon dioxide
C absorbs carbon dioxide
D releases oxygen

8 Which of the following is used to test for carbon dioxide?

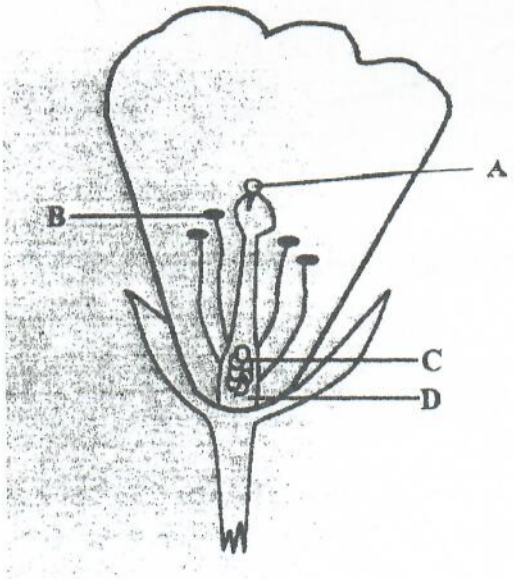
A bicarbonate indicator
B Benedict's solution
C ethanol
D iodine solution

9 Which is an adaptation of leaves to minimise water loss?

A thin cuticle
B increased surface area
C more stomata
D presence of hairs

10 The diagrams show blood components. Which one is responsible for blood clotting?

11 The diagram shows part of a flower. Which part is the female gamete?



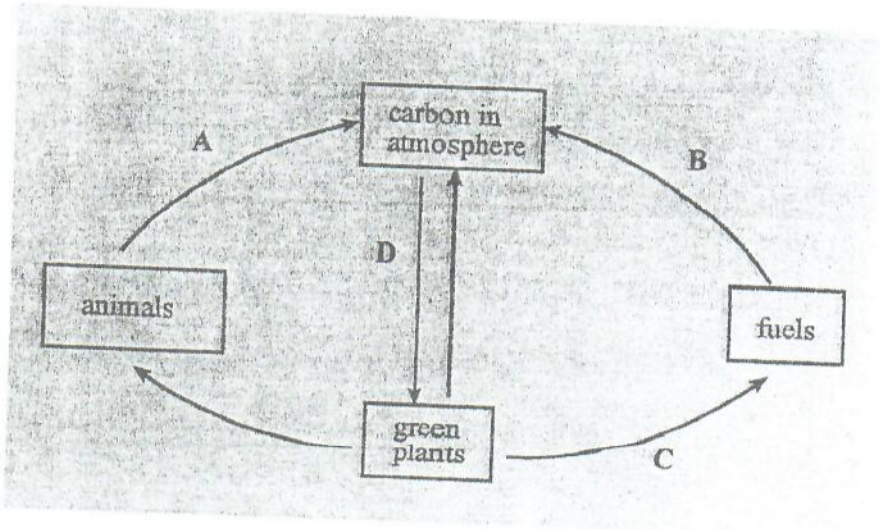
12 What is the disadvantage of vegetative reproduction?

A young plants get food from the parent
B many new plants obtained quickly
C reduced yield
D no genetic variation

13 Which is an example of discontinuous variation?

A height
B number of leaflets
C coat colour
D seeds in a pod

14 The diagram shows a carbon cycle. Which arrow represents fossilization?



15 What is the process by which a solid changes to a gas?

A vaporisation
B sublimation
C melting
D boiling

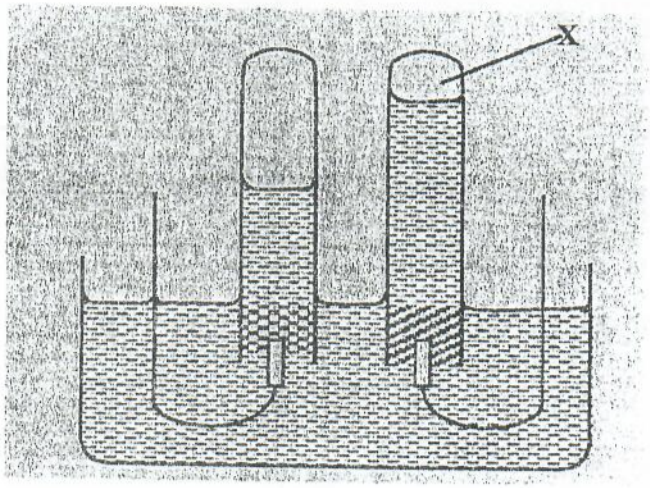
16 Which is a characteristic of bases?

A produce hydrogen when they react with metals
B react with acids to give a salt and water
C have pH values less than 7
D turn blue litmus paper to red

17 Which is an aspect of the Haber process?

A rhodium platinum catalyst
B pressure of 200 atmospheres
C formation of sulphur trioxide
D temperatures of 900 °C

18 The diagram shows a method of producing some industrial gases.



Which industrial gas is **X**?

A nitrogen
B oxygen
C carbon dioxide
D hydrogen

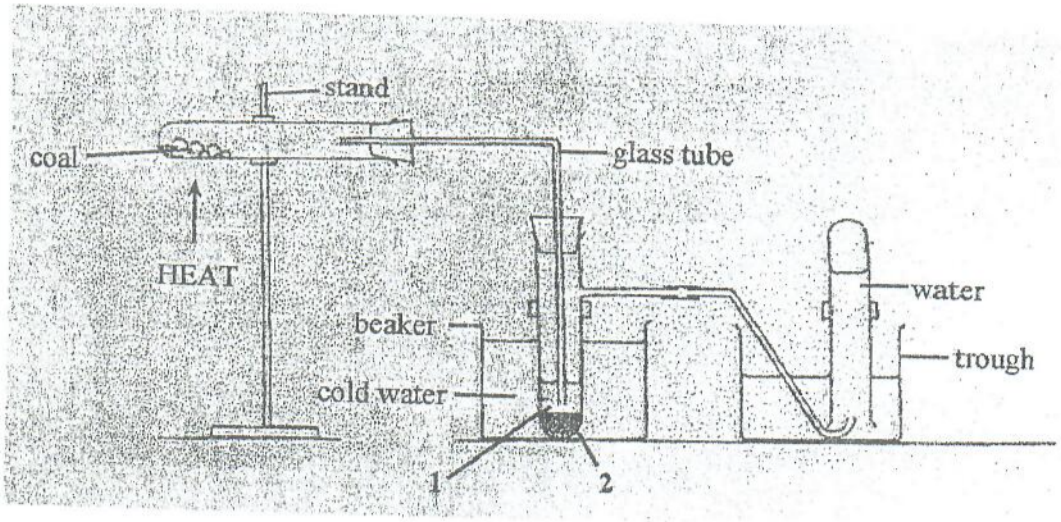
19 Which is a commercial use of hydrogen?

A medical purpose
B hardening of oils to make margarine
C steel manufacture
D welding and cutting metals

20 What is nitric acid used for?

A "burning" off growths on skin
B fizzy drinks
C refrigerant
D fire extinguisher

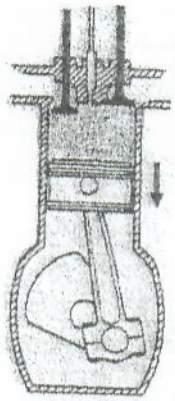
21 The diagram shows destructive distillation of coal.



What are the products 1 and 2?

	1	2
A	ammonia liquor	tar
B	tar	coke
C	coal gas	tar
D	coke	benzol

22 The diagram shows part of an engine cylinder.

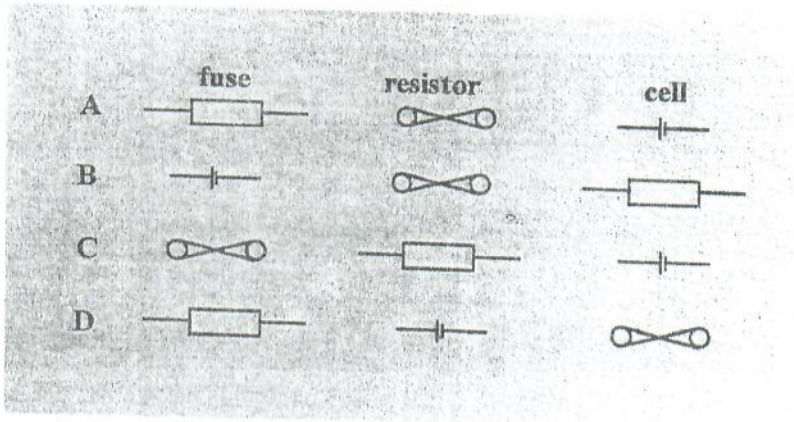


What is the type of engine and stroke?

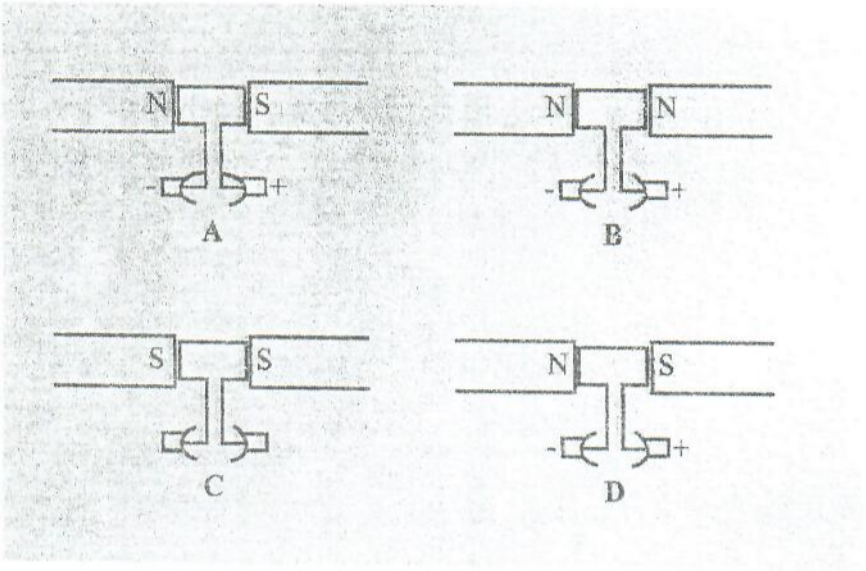
	engine	**stroke**
A	diesel	intake
B	petrol	exhaust
C	diesel	power
D	petrol	compression

23 Which are the correct symbols for fuse, resistor and cell?

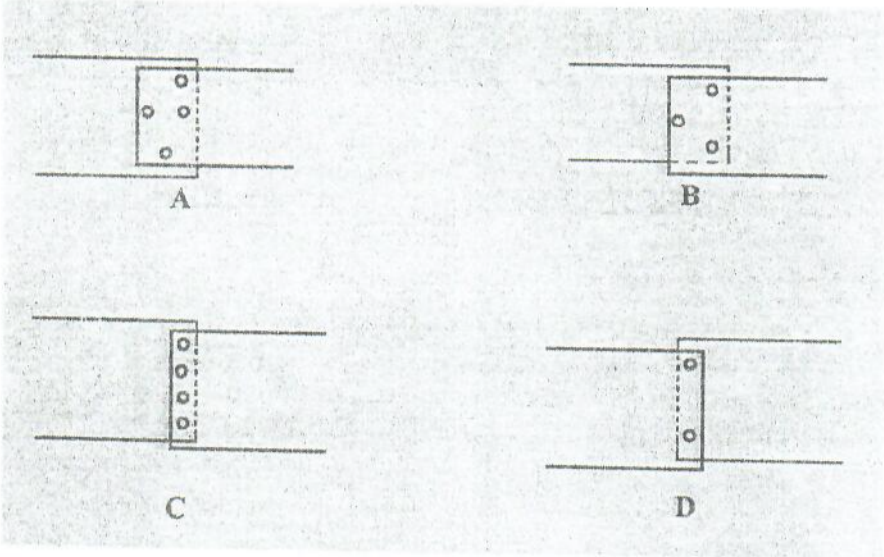
fuse **resistor** **cell**



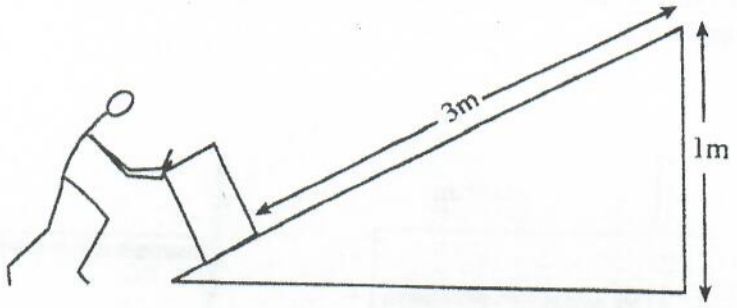
24 The diagrams show electric motors. In which arrangement will the coil move?



25 The diagrams show metal joints. Which joint is the strongest?



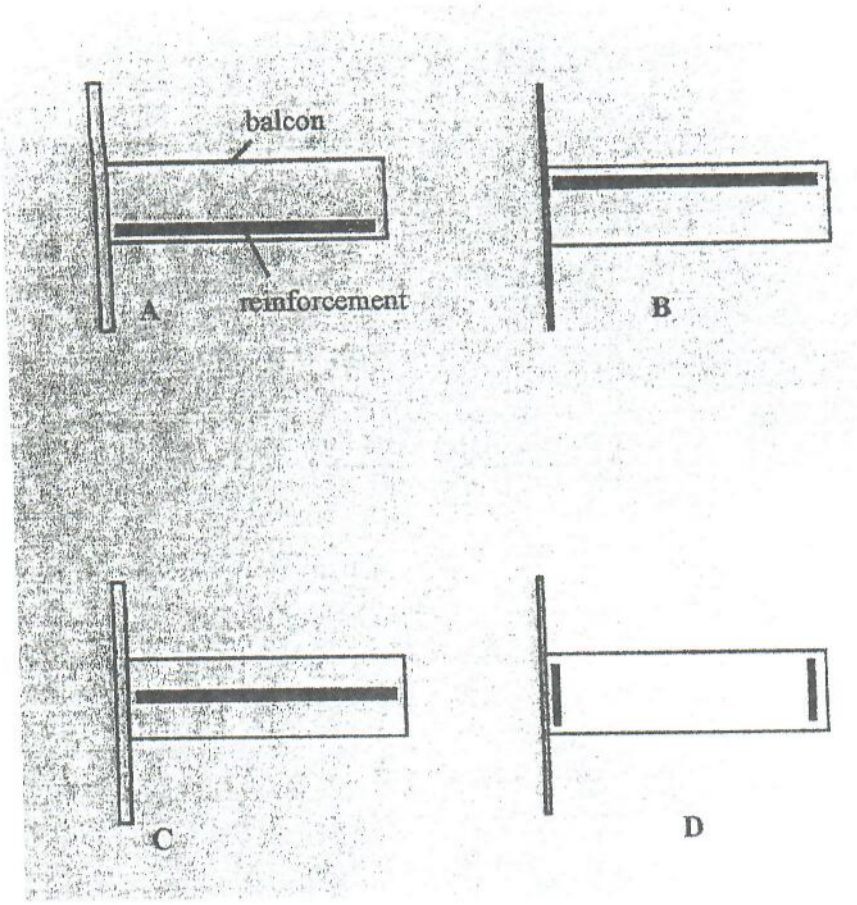
26 A man pushes a 50 kg box up an inclined plane as shown in the diagram below.



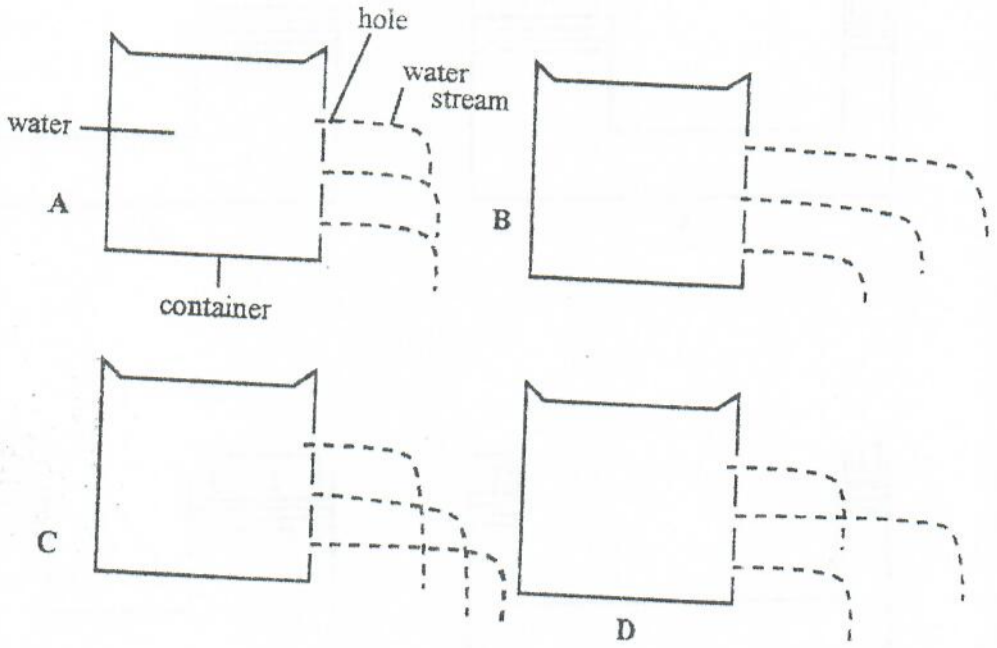
What is the velocity ratio?

A 50
B 16
C 3
D 2

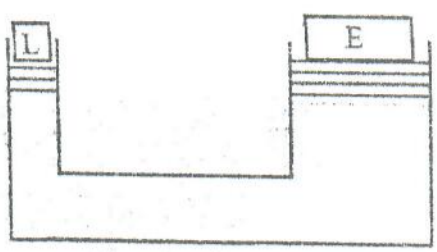
27 The diagram shows a reinforced balcon. Which is the correct position of the reinforcement?



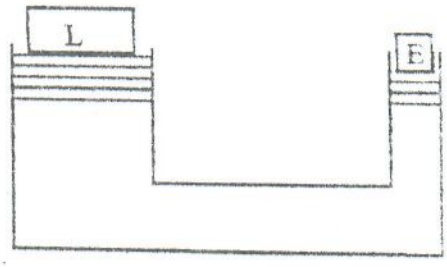
28 The diagrams show cans of the same size filled with water and have the same positions for each. Which diagram shows the correct flow of water from the holes?



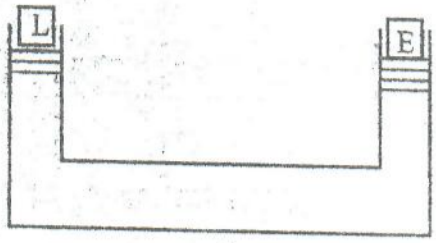
29 The diagrams show hydraulic jacks. Which jack would require least effort?



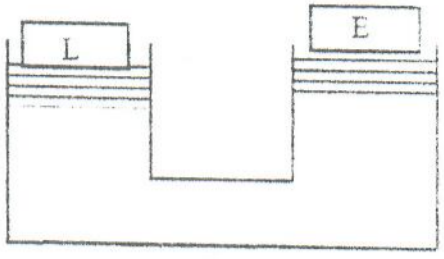
A



B



C



D

30 Which of the following is a characteristic of a force pump?

A can only draw water from a depth less than 10 metres
B delivers water on the down stroke
C needs to be primed
D delivers water on both strokes

31 What term is used to describe an organism that spreads a disease?

A pathogen
B vector
C parasite
D antigen

32 What is the effect of sniffing glue?

A hallucinations
B liver cirrhosis
C emphysema
D bronchitis

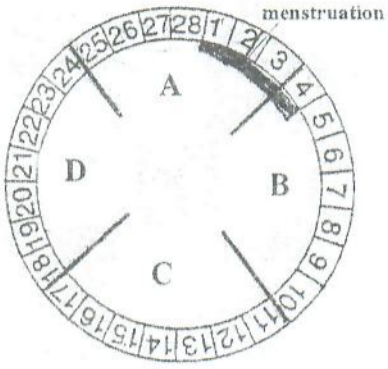
33 Which body defence mechanism protects the gut lining from digestive enzymes?

A stomach acids
B mucus
C blood clotting
D saliva

34 Which statement is true about human gametes?

A Some gametes have chromosomes others do not have chromosomes.
B All gametes have a half set of chromosomes.
C All gametes have a double set of chromosomes.
D All gametes have no chromosomes.

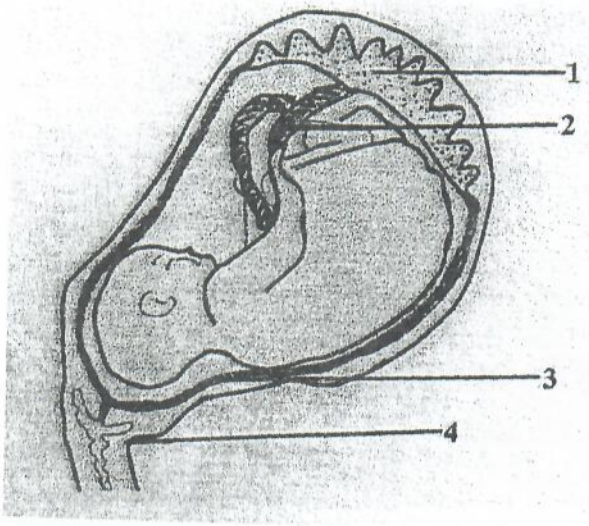
35 The diagram shows a menstrual cycle. When is ovulation likely to take place?



36 Which is a cause of low birth weight in humans?

A sexually transmitted infections
B cancer
C low sperm count
D smoking

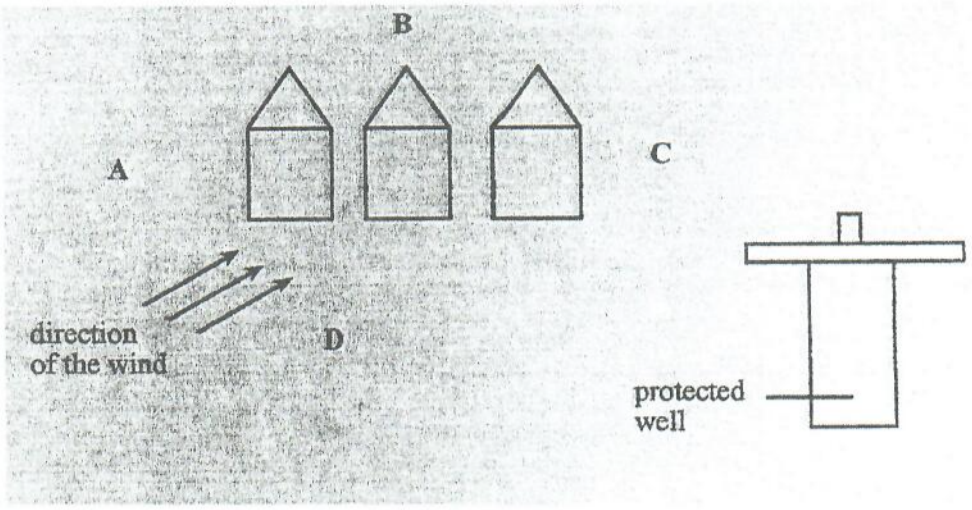
37 The diagram shows a developing embryo.



What is the correct set of functions for parts labelled **1, 2** and **3**?

	shock absorber	**protects against disease**	**carrying nutrients and oxygen**
A	1	2	3
B	2	3	1
C	3	1	2
D	3	2	1

38 The diagram shows a set up of a homestead. Which is the most appropriate site for a latrine.



39 Which method of sewage disposal is most appropriate for a single family in an urban area?

A pit latrine
B septic tank
C biological filter
D blair toilet

40 Which is the correct order of the stages in the large scale treatment of water?

A chlorination, flocculation, sand filter
B flocculation, chlorination, sand filter
C sand filter, chlorination, flocculation
D flocculation, sand filter, chlorination

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

POSSIBLE ANSWERS

JUNE 2009

INTEGRATED SCIENCE 5006/1

INTEGRATED SCIENCE – 5006/01 – JUNE 2009

SUGGESTED ANSWERS

1.	B	21.	A
2.	D	22.	A
3.	D	23.	C
4.	C	24.	A
5.	C	25.	A
6.	B	26.	C
7.	C	27.	B
8.	A	28.	C
9.	D	29.	B
10.	A	30.	D
11.	C	31.	B
12.	D	32.	A
13.	C	33.	B
14.	C	34.	B
15.	B	35.	C
16.	B	36.	D
17.	B	37.	C
18.	B	38.	B
19.	B	39.	B
20.	C	40.	D

Candidate Name | Centre Number | Candidate Number

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

INTEGRATED SCIENCE

PAPER 2

5006/2

JUNE 2009 SESSION

2 hours

Additional materials:
Answer paper

TIME 2 hours

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page and on all separate answer paper used.

Section A

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

Section B

Answer **all** questions.

Write your answers on the separate answer paper provided.

At the end of the examination, fasten the separate answer paper securely to the question paper.

INFORMATION FOR CANDIDATES

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

You are advised to spend no longer than 45 minutes on Section A and 1 hour 15 minutes on Section B.

FOR EXAMINER'S USE	
Section A	
Section B	
6	
7	
8	
9	
10	
TOTAL	

This question paper consists of 10 printed pages and 2 blank pages.

For Examiner Use

Section A

*Answer **all** questions in this section in the spaces provided.*

You are advised to spend no longer than 45 minutes on this section.

1 **Fig. 1** shows pollen tubes growing down the style. Label the stigma, ovule and pollen grain on **Fig.1**. [3]

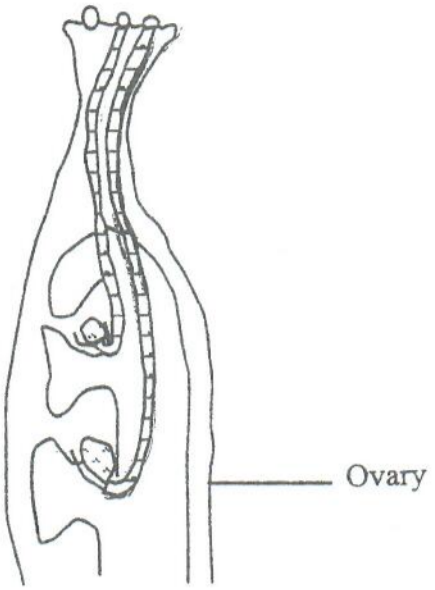


Fig. 1

(b) (i) Define *fertilisation* in plants.

_____

_____ [2]

(ii) Spraying of insecticides in orchards is discouraged because it reduces fruit yields. Explain.

_____

_____

_____ [3]

[Total: 8]

For Examiner's Use

2 In an experiment carried out by students substance **X** turned blue litmus paper red.

(a) **(i)** What is substance **X** likely to be?

_____ [1]

(ii) State the products of the reaction between substance **X** and a metal.

_____

_____ [2]

(b) **(i)** Define *neutralisation*.

_____

_____ [2]

(ii) Explain why the formation of ammonium nitrate fertilizer from nitric acid is referred to as neutralisation.

_____

_____

_____ [3]

[Total: 8]

For Examiner's Use

3 Fig.2 shows a simple electrical circuit used to investigate the relationship between potential difference and current.

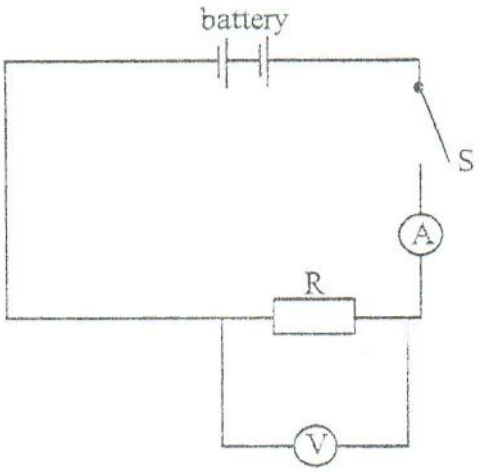


Fig. 2

(a) (i) State how the ammeter and voltmeter are connected in Fig 2.

1. ammeter:

_____

2. voltmeter:

_____ [2]

(ii) Calculate the current passing through a resistor, R, of 4 ohms when the potential difference across the resistor is 3.0 volts.

Current = _____ [2]

(b) Cells in a battery can be connected in series or in parallel.

For Examiner's Use

(i) Describe the advantages of connecting cells in parallel.

_____

_____

_____

_____ [2]

(ii) Why should cells **not** be left connected?

_____

_____ [2]

[Total: 8]

4 (a) Identify **two** materials used in construction of large structures such as bridges and state the advantages of using the materials.

material 1:

_____

_____

advantage:

_____

_____

material 2:

_____

_____

advantage:

.....

..... [4]

(b) **Fig.** 3 shows a dam wall.

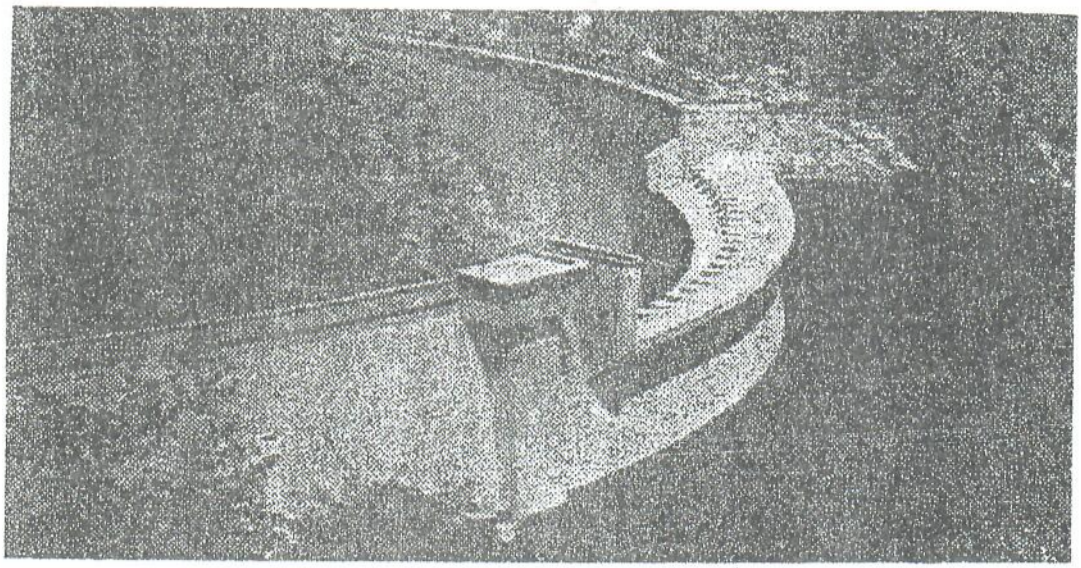


Fig.3

(i) Describe the shape of the dam wall shown in **Fig. 4.**

.....

..... [1]

(ii) Why do dam walls have the shape in (b)(i)?

.....

.....

..... [3]

[Total: 8]

5 Some wastes can be recycled in a compost heap; while other wastes are non-biodegradable.

For Examiner's Use

(a) (i) Define *non-biodegradable* wastes?

_____

_____ [2]

(ii) Give **two** examples of non-biodegradable wastes.

_____

_____ [2]

(iii) Suggest **three** disposal methods of non-biodegradable wastes.

1 _____

_____

2 _____

_____

3 _____

_____ [3]

(b) State **one** useful product of recycling in a compost heap.

_____

_____ [1]

[Total: 8]

Section B

*Answer **all** questions on the separate answer paper.*

6 **(a)** Describe, with examples, in-breeding in animals. [2]

(b) Describe the advantages and disadvantages of cross breeding cattle in Zimbabwe. [6]

(c) The 1992 drought killed many cattle in Zimbabwe. This reduced the national herd drastically. Suggest and explain two ways of increasing the national herd to meet the country's needs. [4]

[Total: 12]

7 **Fig. 5** shows the apparatus used in copper plating a piece of steel sheet.

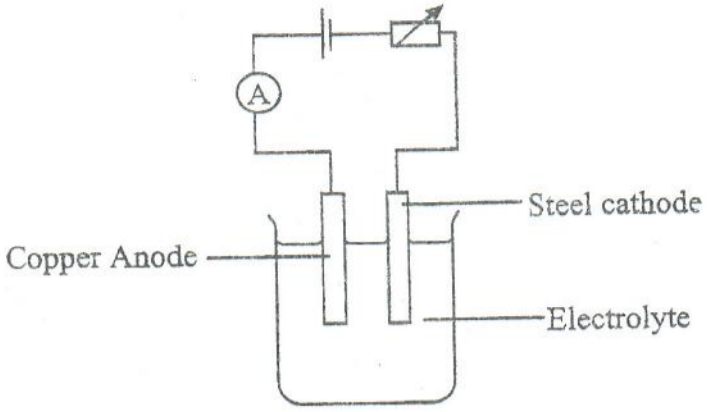


Fig. 5

(a) **(i)** State the electrolyte used in the process. [1]

(ii) Describe and explain how the steel sheet becomes coated with copper. [6]

(b) Explain why materials need to be coated. [2]

(c) State **three other** methods of coating materials. [3]

[Total:12]

8 **Fig.6** shows apparatus used to illustrate a simple cell.

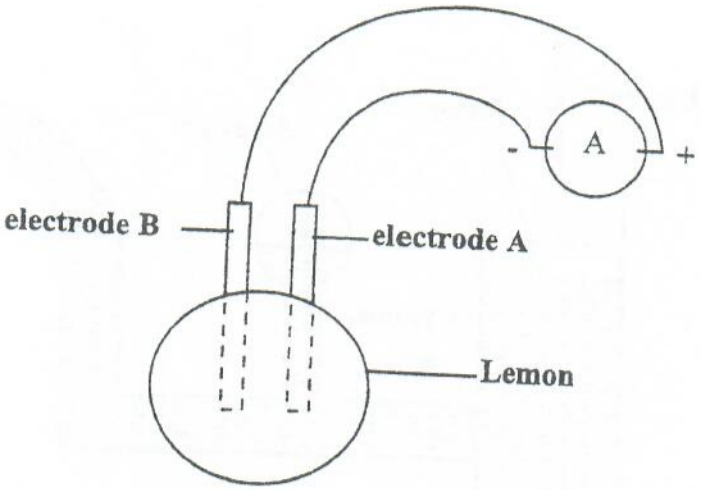


Fig. 6

(a) (i) Name with reasons the materials from which each electrode could be made. [4]

(ii) Describe and explain what may be observed after inserting the electrodes into the lemon

1. immediately,

2. after a while. [6]

(b) State **two** disadvantages of a lead-acid cell over a dry cell. [2]

[Total: 12]

9 **Fig. 7** shows a force pump.

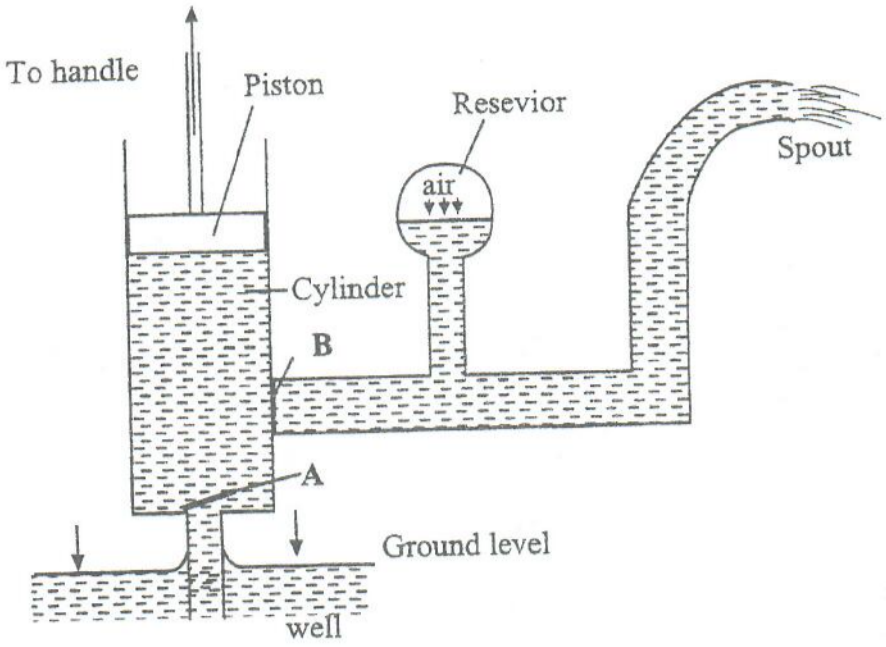


Fig. 7

(a) Use **Fig.7** to describe and explain the operation of a simple force pump. [8]

(b) Describe the differences between a force pump and a lift pump. [4]
[Total:12]

10 **(a)** State **four** factors that determine the population change of a country. [4]

(b) Economic development of a country can be judged from the quality of its health and social services. Suggest **three** characteristics of high quality of health and social services in a country. [3]

(c) Why should a country monitor its population growth? [5]
[Total: 12]

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

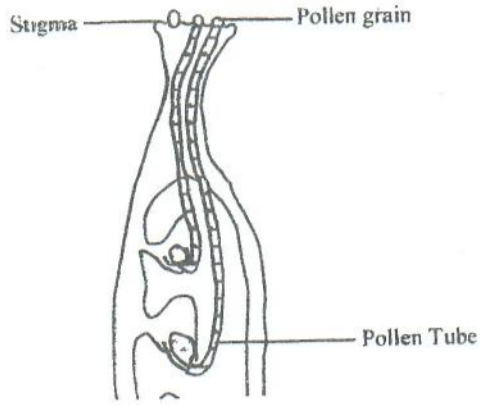
General Certificate of Education Ordinary Level

POSSIBLE ANSWERS

JUNE 2009

INTEGRATED SCIENCE **5006/2**

1 (a)



(3)

(b) (i) fusion of pollen grain nucleus; with ovule nucleus; (2)

(ii) insecticide kills insects; insects bring about pollination; no pollination; no fertilisation; no fruits; (3)

Total: [8]

2 (a) (i) acid; (1)

(ii) a salt; hydrogen; (2)

(b) (i) reaction between an acid and a base; formation of a salt and water; (2)

(ii) ammonia gas; (a base) (bubbled into nitric acid) forms ammonium nitrate (a salt); and water; (3)

Total: [8]

3 (a) (i) 1. ammeter: series;

2. voltmeter: parallel; (2)

(ii) current $= \frac{V}{R} \Big/ \frac{3}{4}$;

$= 0{,}75$ amps;
unit must be correct to award the mark. (2)

(b) (i) provide a large current;
provide voltage equivalent to one cell/
last longer (2)

(i) cells create a complete circuit; continue to discharge; until flat; (2)
Any two points

Total: [8]

4 (a) material: wood;

advantage: cheap;

material: concrete;

advantage: strong in compression;

material: metal;

advantage: strong in tension and compression;

material: stone;

advantage: strong in compression/ durable/cheap;

Any 2 materials and their advantages (4)

(b) (i) concave (toward dam/water)/ curved shape/; (1)

(ii) concave/curved shape transmit forces; of water to the sides/ embarkments; wall can withstand large thrusts; (broad base) to withstand large forces at the bottom; pressure increases with depth; [3]

Total: [8]

5 (a) (i) wastes that cannot be broken down; by organisms; [2]

(ii) plastic;
rubber;
glass; Any two [2]

(ii) burning;
burying;
industrial recycling; [3]

(b) humus; [1]

Total: [8]

Section B

6 (a) mating of animals; closely related; [2]

(b) advantages: milk; meat; disease resistance; hybrid vigour; early maturity;

disadvantages: undesirable characteristics may surface; [6]

(c) cross Mashona with Braman; for more meat/Braham large; fast growth; drought resistance;
cross jersey with Mashona; Jersey has high milk yield; (explanation to be linked to the cross) [4]
Total: [12]

7 (a) (i) (acidified) copper (II) sulphate solution; (acidified can be left out) [1]

(ii) copper atoms lose electrons; become copper ions; move to cathode; gain electrons; become copper atoms; stick to the steel sheet; giving it a thin coating of copper; Any six points. [6]

(b) decoration; prevention of corrosion; [2]

(c) galvanising; Nickel plating; chrome plating; painting; Any three [3]
Total: [12]

8 (a) (i) A: zinc; connected to negative terminal of voltmeter/negative of simple cell is zinc; more reactive than copper;

B: copper; connected to negative terminal of voltmeter/copper is positive electrode of simple cell; less reactive than zinc; [4]
Two marks on each of A and B.

(ii) 1: voltmeter deflected; to right; showing presence of an e.m.f; Voltmeter goes back to zero; 2; Polarisation has occurred; No more electricity flowing; the citric acid/lemon juice; acts as electrolyte; [6]

(b) lead acid cell:
heavy; electrolyte corrosive; expensive;
Any two points (2)
Total: [12]

9 (a) piston moves up;
valve B closes; valve A opens;
atmospheric pressure;
forces water up through valve A;
into the cylinder;

piston moves down;
valve A closes; valve B opens;
water is forced through valve B
into the reservoir;
and out of the spout;
pressure of air trapped in the reservoir;
forces water to flow continuously; [8]
Any 8 points in a meaningful/correct sequence.

(b) lift pump can only lift water
through a height of less than 9m;
it relies on atmospheric pressure only;
delivers water on the upstroke only;
has to be primed;
(4)
Total [12]

10 (a) birth rate;
death rate;
migration;
mortality;
growth rate;
[4]

(b) (i) low mortality of under five;
high life expectancy;
reduced levels of social problems;
[3]

(c) rapid population growth;
leads to over population;
and environmental degradation;
over-stretching of health services;
social and educational services;
leading to deterioration of living standards;
and poverty;
[5]
Total: [12]

Candidate Name	Centre Number	Candidate Number

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

INTEGRATED SCIENCE 5006/3

PAPER 3

JUNE 2009 SESSION 1 hour

Candidates answer on the question paper

Additional materials:

- Soft pencil (type B or HB is recommended)
- Soft clean eraser
- Ruler (cm/mm)
- Mathematical tables/calculator

Time 1 hour

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page.
Answer **all** questions.
Write your answers in the spaces provided on the question paper.

INFORMATION FOR CANDIDATES

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

FOR EXAMINER'S USE	
1	
2	
3	
4	
TOTAL	

This question paper consists of 10 printed pages and 2 blank pages.

[Turn over

For Examiner's Use

1 Fig. 1 represents an experiment which was set up to investigate conditions necessary for seeds to germinate.

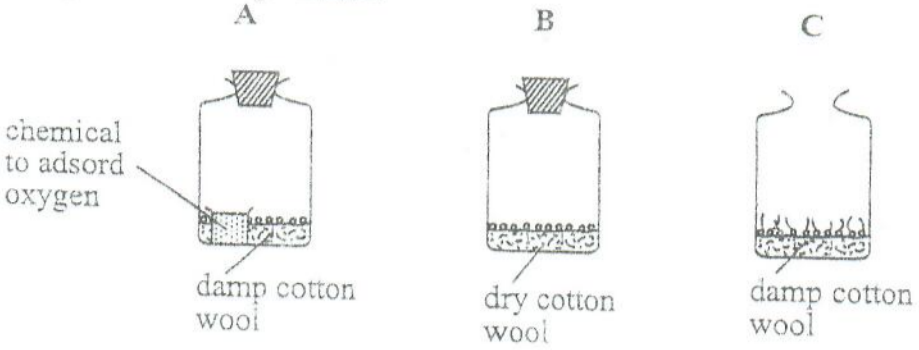


Fig. 1

(a) (i) What is the name of the chemical that was used to absorb oxygen?

_____ [1]

(ii) Name **one** external factor that is not referred to in Fig. 1.

_____ [1]

(iii) State your observations of the seeds in the jars.

A _____

B _____

C _____ [3]

(iv) Which jar shows the presence of all the conditions necessary for germination?

_____ [1]

For Examiner's Use

(b) **Fig. 2** shows part of the apparatus used to investigate gas production during germination.

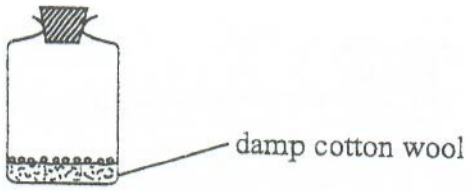


Fig. 2

(i) Complete **Fig. 2** by drawing and labelling the additional apparatus and reagents needed for the experiment. [2]

(ii) The gas produced during germination is carbon dioxide. Describe a test for this gas.

test: _____

_____

_____ [2]

[Total: 10]

For Examiner's Use

2 (a) Fig. 3 shows the apparatus set-up to investigate the speed of a chemical reaction. Pieces of a metal were dropped into an acid and a gas was produced.

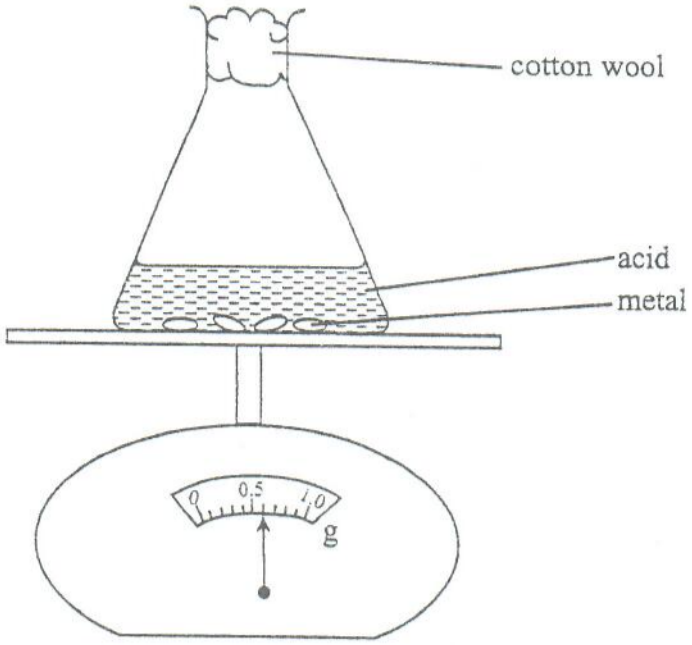


Fig. 3

(i) Why was a cotton wool plug used?

_____ [1]

(ii) Read and record the mass in **Fig. 3**.

_____ [1]

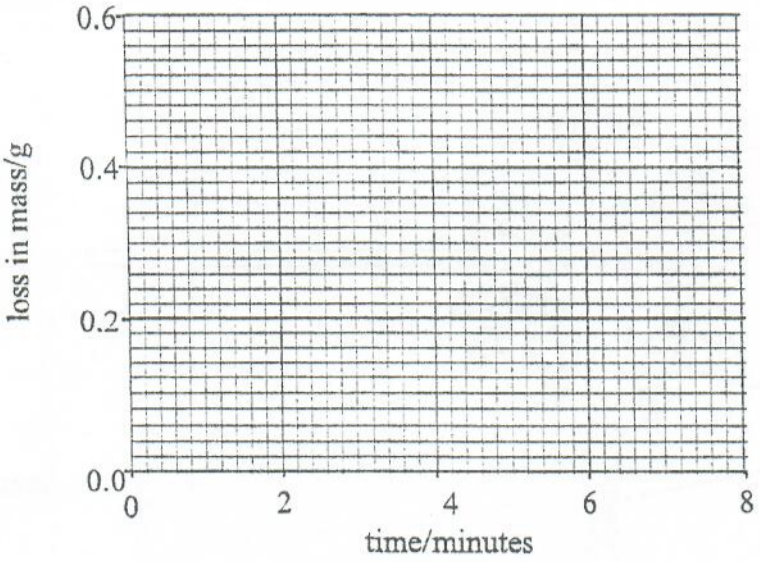
(b) The mass of the flask and its contents was read, loss in mass calculated and recorded every minute. The results are shown in **Table 1**.

Table 1

Time/minutes	2	3	4	5	6	7
Loss in mass/g	0.31	0.40	0.46	0.47	0.49	0.49

For Examiner's Use

(i) Plot a graph of loss in mass against time on the grid given. [2]



(ii) Use your graph to estimate the loss in mass after **one** minute.

_____ [1]

(iii) Name **one** metal and **one** acid which you could use in this experiment.

metal _____

acid _____ [2]

(c) Using a dotted line, draw on the same axes a graph you would expect if an equal mass of the powdered metal had been used instead. [2]

(d) State **one** other method of making a reaction between a solid and a liquid go more slowly.

_____ [1]

[Total: 10]

For Examiner's Use

3 **Fig. 4** shows apparatus set-up to determine the rate of a biological process under different conditions.

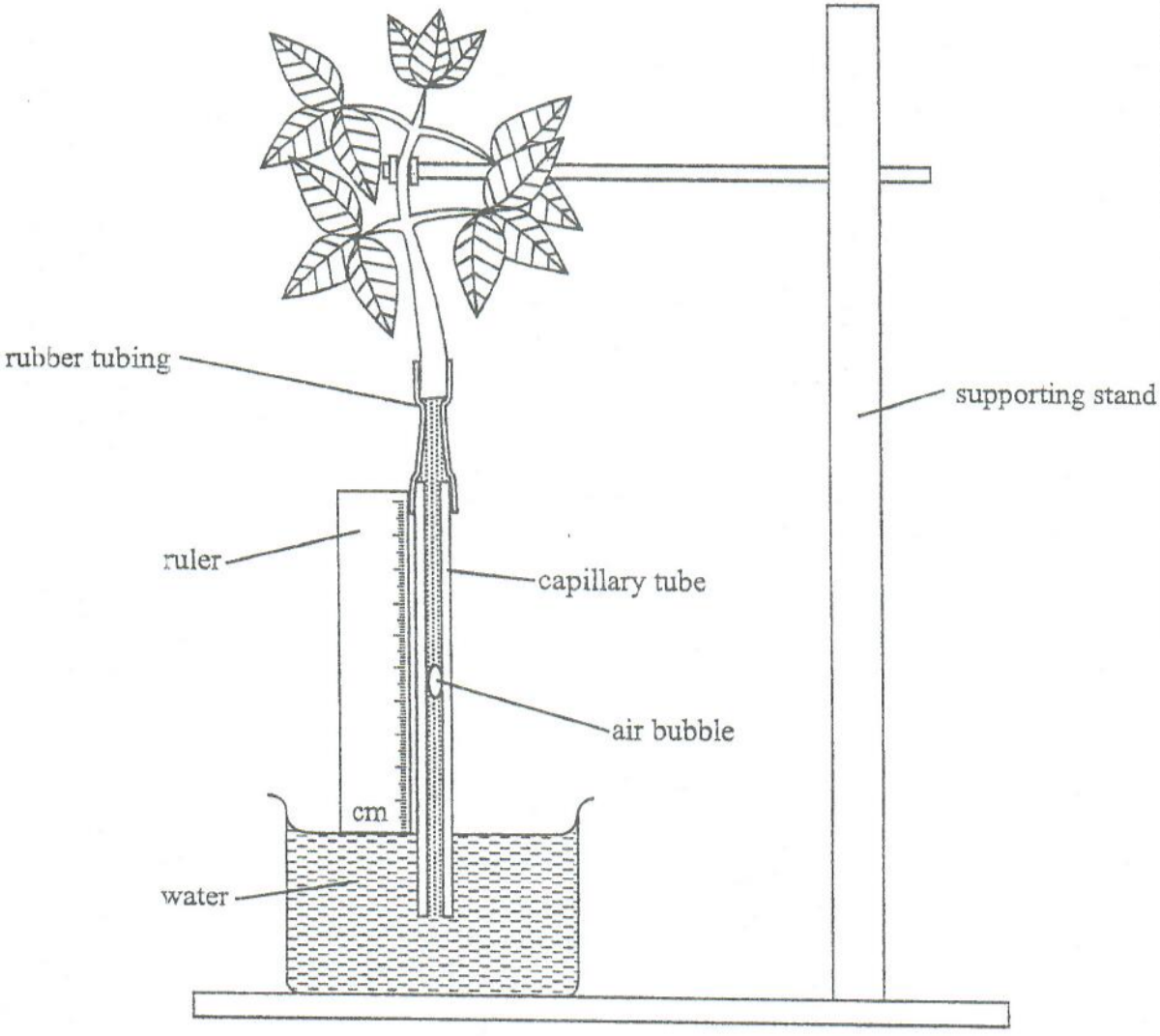


Fig. 4

(a) When the meniscus in the capillary tube moves along, what is being directly measured?

_____ [1]

(b) A student carried out three investigations under different conditions and recorded the time in seconds taken by the memiscus to move a distance of 50 mm. **Table 2** shows the results.

For Examiner's Use

Table 2

	conditions	time/seconds
1.	in a room at room temperature	40
2.	at room temperature in a room with air from a fan directed at the leaves	30
3.	with two bright light bulbs on either side of leaves	19

(i) Calculate the rate of water movement under the three conditions investigated, stating the units.

1. _____

2. _____

3. _____ [3]

(ii) What are the factors which were under investigations in conditions **2** and **3**?

2 _____

3 _____ [3]

(iii) Explain how the factors in condition **3** affected the rate of water movement.

_____

_____

_____ [2]

(c) Name the biological process which was under investigation.

_____ [1]

[Total: 10]

4 Fig. 5 shows the apparatus set up to compare heat absorption by different coloured surfaces.

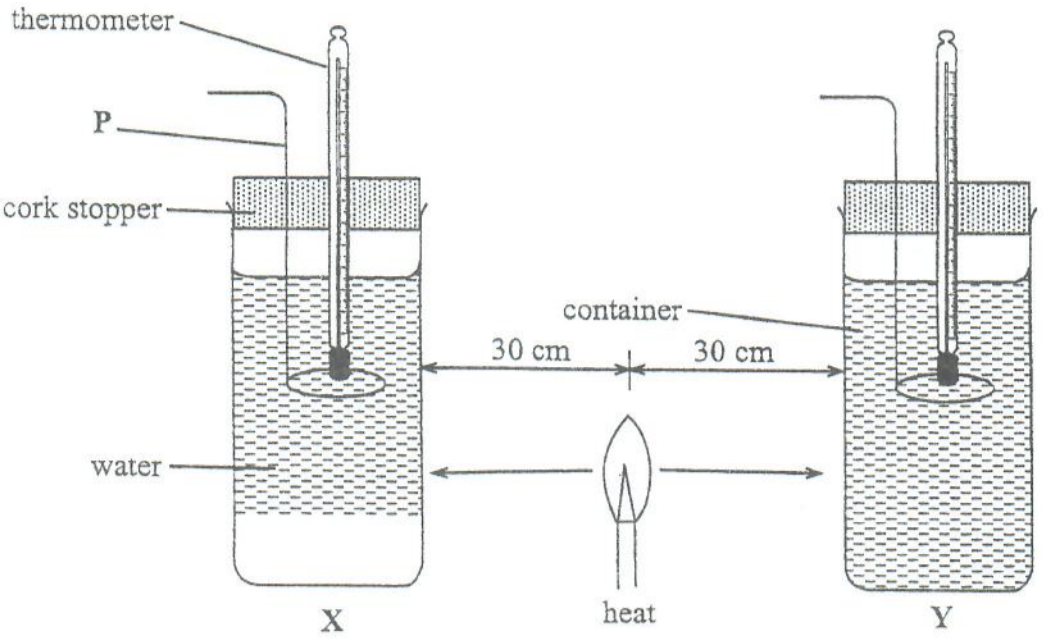


Fig. 5

(a) (i) Why was a cork stopper used for each tube?

_____

_____ [1]

(ii) Why was a space left below the cork stopper in each tube?

_____

_____ [1]

For Examiner's Use

(iii) Identify and state the use of apparatus P in the experiment.

P _____

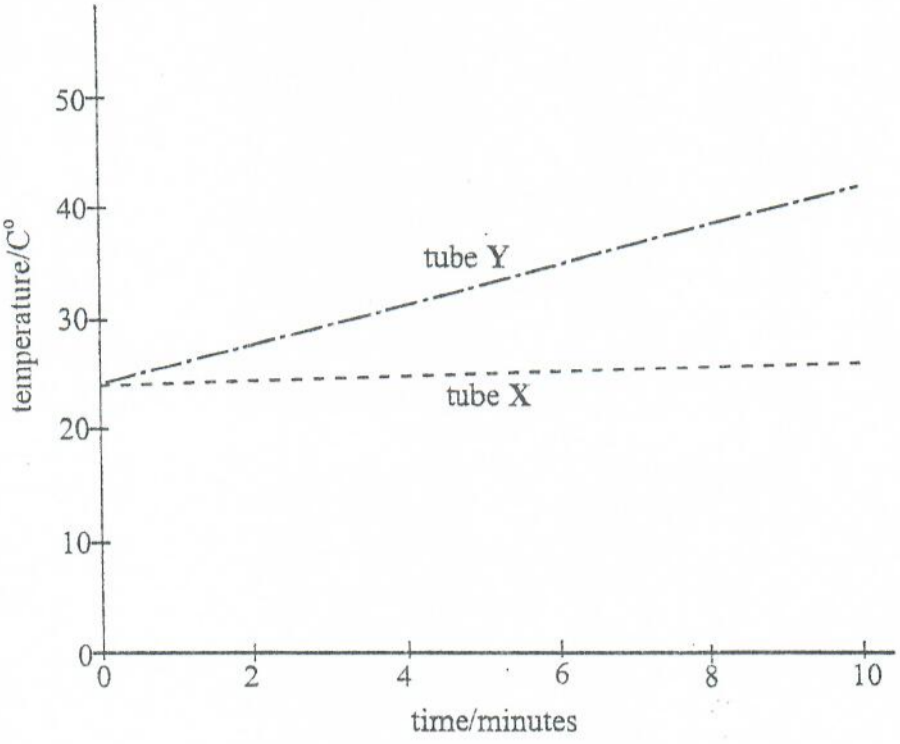
use _____ [1]

(iv) Why was the heat source placed at equal distances from each of the tubes X and Y?

_____

_____ [1]

(b) The temperatures of the tubes were read and recorded at **two** minute intervals for **ten** minutes. The results were used to plot the graphs shown in the grid.



For Examiner's Use

(i) What was the temperature of the tube **X** at 8 minutes?

_____ [1]

(ii) State the method of transmission of heat to the tubes.

_____ [1]

(iii) Explain the difference between graphs **X** and **Y**.

_____

_____

_____ [3]

[Total: 10]

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

POSSIBLE ANSWERS

JUNE 2009

INTEGRATED SCIENCE 5006/3

1 (a) (i) Alkaline pyrogallol; [1]

(ii) Temperature/warmth [1]

(iii) A - No germination;
B - No germination;
C - Seeds germinate; [3]

(iv) C; [1]

(b) (i) suspended test tube; [1]
with limewater or bicarbonate indicator; [1]

(ii) Bubble the gas in limewater; and the limewater turns milky or chalky; [2]

If bicarbonate indicator is used; it turns yellow;

Total [10]

2 (a) (i) To prevent the gas produced escaping quickly; [1]

(ii) 0,6 g; [1]

(b) (i) all points correctly plotted; all points joined with a line, including the origin; [2]

(ii) 0,18 g; [2]

(iii) magnesium; and hydrochloric acid; [1]

[2]

(c) dotted graph in b(ii) axes [2]

(d) reduce temperature or reduce the concentration of the liquid; [1]

Total [10]

3 (a) Water uptake [1]

(b) (i) 1. $\frac{50mm}{40\ sec} = 1{,}25mm/sec$

2. $\frac{50mm}{30\ sec} = 1{,}7mm/sec$

3. $\frac{50\ mm}{19\ sec} = 2{,}6mm/sec$ [3]

(ii) 2 - humidity/wind;
3 - light intensity; and temperature; [3]

(iii) light intensity caused stomata to open wide; heat caused more water to evaporate; [2]

(c) Transpiration; [1]

4 (a) (i) to prevent heat loss through vapour; [1]

(ii) to allow vapour to accumulate as water was heated [1]

(iii) stirrer/to stir water so that there is even distribution of heat; [1]

(iv) to ensure that both tubes receive equal amount of heat, for a reliable comparison to be made; [2]

(b) (i) 25°C; [1]

(ii) radiation; [1]

(iii) Container Y must be darker in colour; than container X; as it absorbs more heat and transmits it faster than container X.

OR

Container X must be lighter in colour; because it reflects more heat and transmits less; So, the temperature in tube Y rose higher and faster than in tube X; [3]

Total [10]

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

INTEGRATED SCIENCE 5006/1

PAPER 1 Multiple Choice

NOVEMBER 2009 SESSION 1 hour

Additional materials:
- Multiple Choice answer sheet
- Soft clean eraser
- Soft pencil (type B or HB is recommended)

TIME 1 hour

INSTRUCTIONS TO CANDIDATES

Do not open this booklet until you are told to do so.
Write your name, Centre number and candidate number on the answer sheet in the spaces provided unless this has already been done for you.

There are **forty** questions in this paper. Answer **all** questions. For each question there are four possible answers, **A, B, C** and **D**. Choose the **one** you consider correct and record your choice in **soft pencil** on the separate answer sheet.

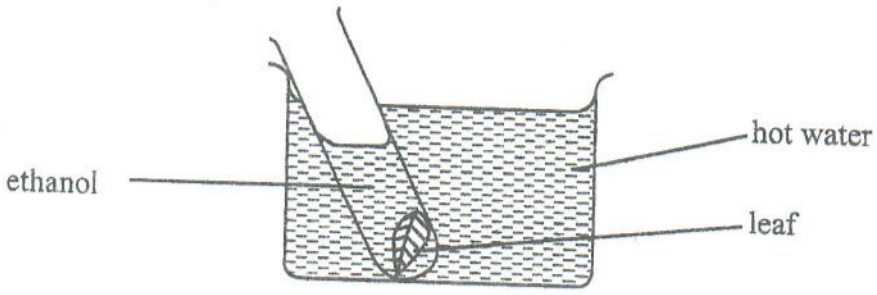
Read very carefully the instructions on the answer sheet.

INFORMATION FOR CANDIDATES

Each correct answer will score one mark. A mark will not be deducted for a wrong answer. Any rough working should be done in this booklet.

This question paper consists of 15 printed pages and 1 blank page.

1 The diagram shows a stage in testing a leaf for starch.



Why is the leaf boiled in ethanol?

A to soften it
B to extract chlorophyll
C to break down cell walls
D to stop the action of enzymes

2 Which substance emulsifies fats in the alimentary canal?

A bile
B gastric juice
C hydrochloric acid
D pancreatic juice

3 Which is a symptom of foot and mouth?

A blown up stomach
B blood in watery faeces
C production of a lot of saliva
D blood in nose and mouth of dead animals

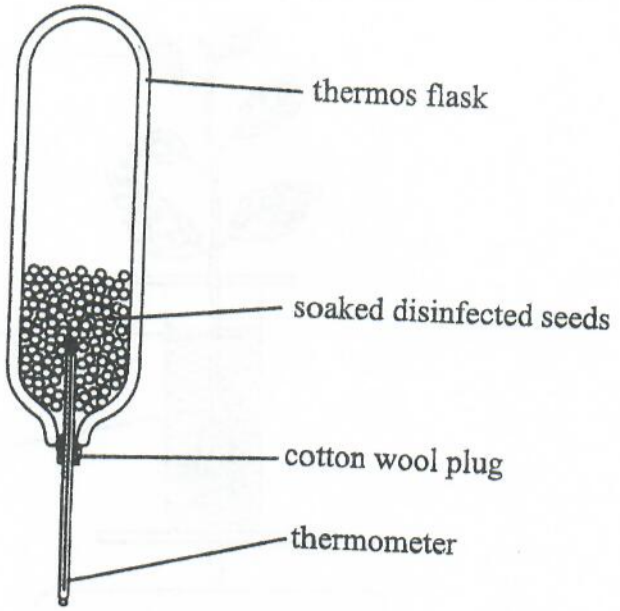
4 Which statement is correct about animal pests and diseases?

A Foot and mouth is a bacterial disease.
B Anthrax is a viral disease.
C Ticks can be controlled by dosing.
D Flukes live in the liver of cattle.

5 What is the path followed by air from the nose to the lungs?

A alveoli, bronchi, trachea
B alveoli, trachea, bronchi
C bronchi, alveoli, trachea
D trachea, bronchi, alveoli

6 The diagram shows an experiment to demonstrate production of heat by germinating seeds.



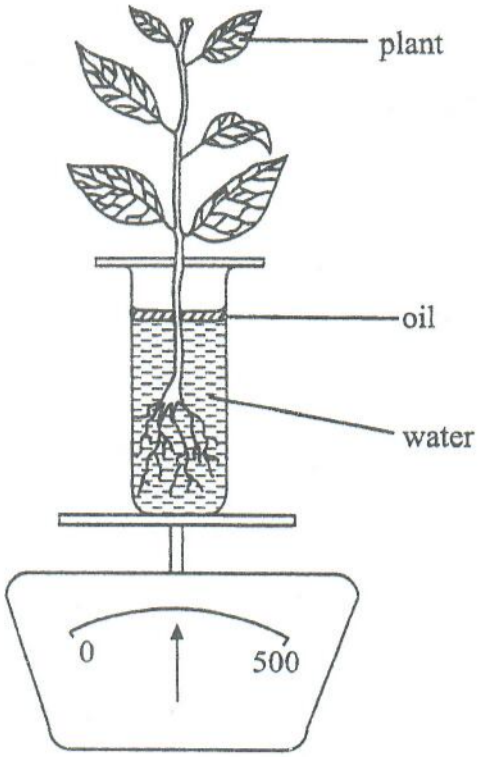
The flask is upside down to prevent

A air from entering.
B heat from escaping.
C seeds falling out.
D seeds from rotting.

7 What is the process by which mineral ions move from the soil into a plant?

A active transport
B diffusion
C osmosis
D transpiration pull

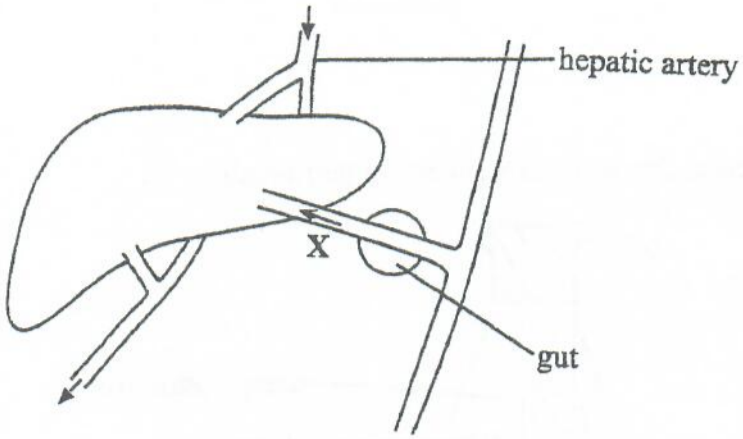
8 The diagram shows an experiment on transpiration.



What is observed if the apparatus is left in bright sunlight for several hours?

A level of water rises
B level of water remains the same
C leaves droop
D reading on the balance decreases

9 The diagram shows the liver and associated blood vessels.



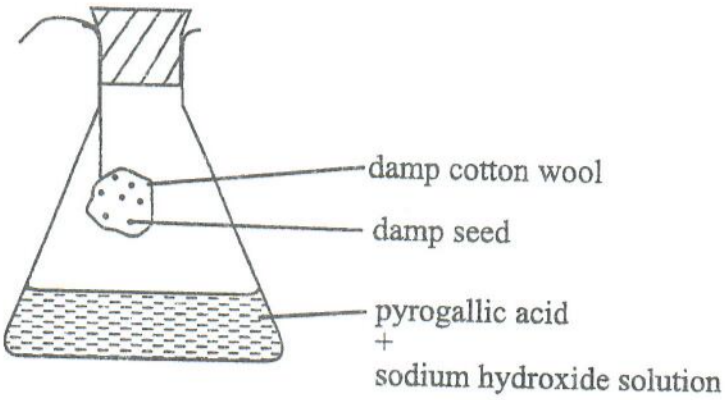
What is true about blood in vessel **X**?

Substance	Concentration		
	Oxygen	**carbon dioxide**	**glucose**
A	low	high	low
B	low	high	high
C	high	low	low
D	high	low	high

10 Which part of blood transports hormones?

A plasma
B platelets
C red blood cells
D white blood cells

11 The diagram shows an experiment on germination.



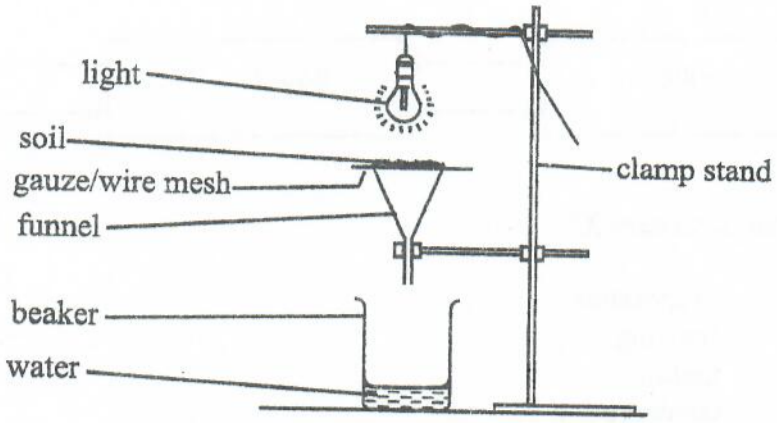
Which condition necessary for germination is being investigated?

A moisture
B carbon dioxide
C oxygen
D warmth

12 What is responsible for the appearance of many different breeds of cattle?

A artificial selection
B line breeding
C natural selection
D evolution

13 The diagram shows apparatus used in the extraction of soil organisms.

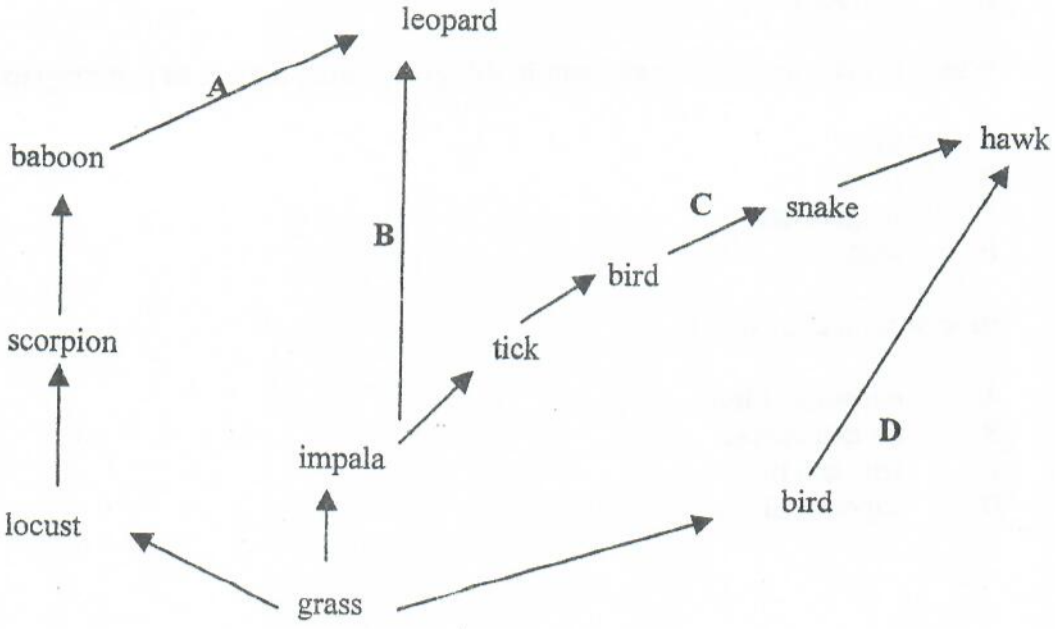


What would be the advantage of replacing water with ethanol?

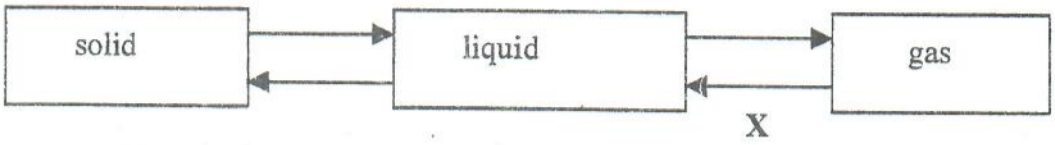
A Ethanol is a nutrient.
B Ethanol is a preservative.
C Ethanol evaporates easily.
D Ethanol keeps organisms alive.

14 The diagram shows a food web consisting of four food chains.

Which food chain has the organism at the end receiving the least amount of energy?



15 The flow diagram shows changes in state.



What is process **X**?

A evaporation
B freezing
C melting
D condensation

16 A magnesium atom has 12 protons. How many electrons does it have?

A 6
B 11
C 12
D 24

17 What is used to separate a mixture of iron filings and sulphur?

A charged perspex
B hand picking
C magnet
D filtration

18 Which is the least reactive element in this group: iron, zinc, lead and magnesium?

A zinc
B iron
C magnesium
D lead

19 Bronze is an alloy of

A copper and iron.
B tin and copper.
C zinc and iron.
D copper and zinc.

20 Which pair of gases has boiling points of −183°C and −196°C?

A hydrogen and oxygen
B ammonia and nitrogen
C oxygen and nitrogen
D hydrogen and ammonia

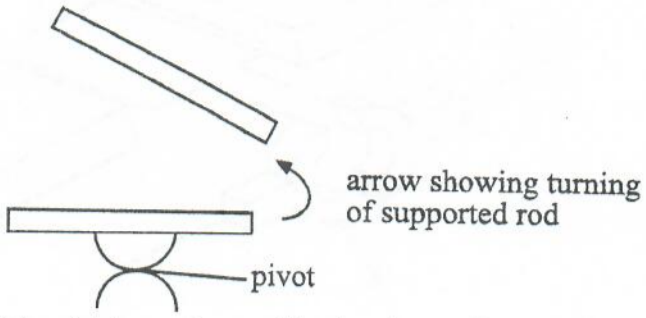
21 What is the role of yeast in the fermentation process?

A changes glucose to starch
B provides an enzyme
C changes starch to alcohol
D slows down the reaction

22 Which stroke in an engine converts chemical energy to kinetic energy?

A power
B compression
C exhaust
D intake

23 The diagram illustrates static electricity in which materials become charged with either positive or negative charges.

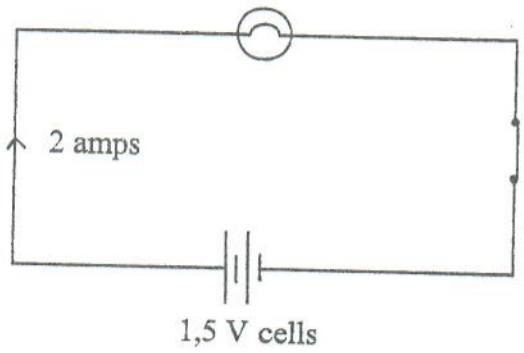


Below are materials which can be used in the above diagram

Which material can be charged positively?

A perspex
B polythene
C iron rod
D wood

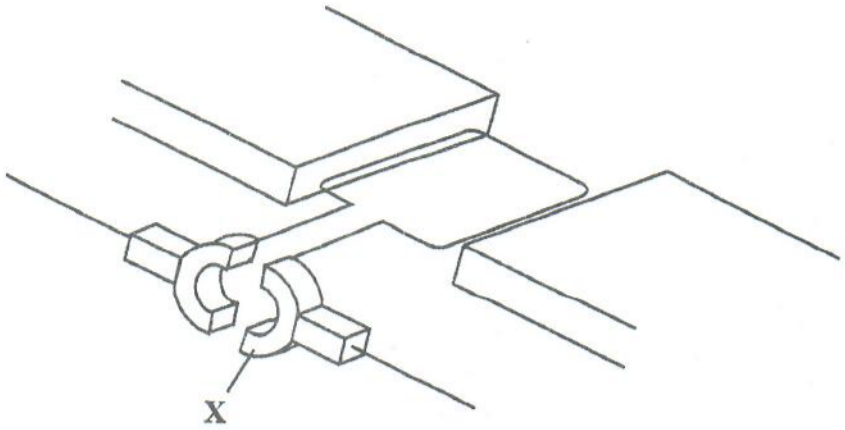
24 The diagram shows an electric circuit.



What is the power of the bulb?

A 3.0 watts
B 3.5 watts
C 5.0 watts
D 6.0 watts

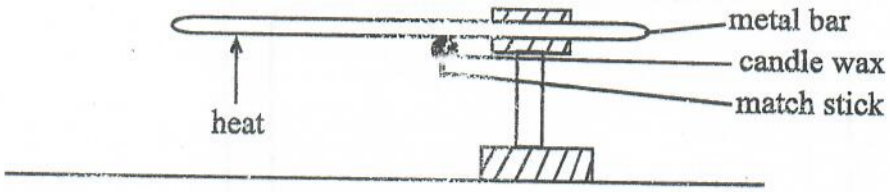
25 The diagram shows a simple d.c. generator.



What is **X**?

A split ring
B slip ring
C carbon brush
D magnetic field

26 The diagram shows a method of heat transfer in solids.



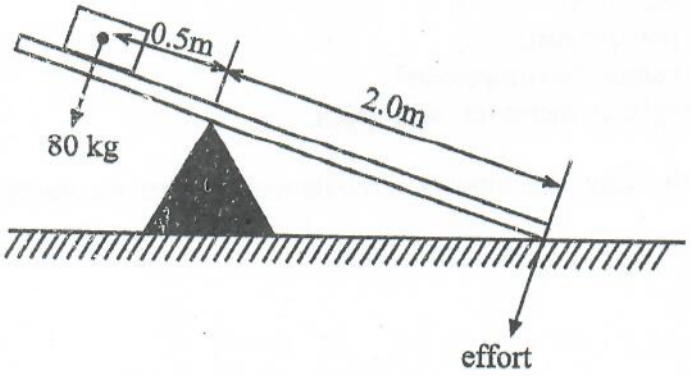
What is this method?

A convection
B radiation
C conduction
D reflection

27 Why is concrete reinforced in the construction of large structures?

A It is strong in compression.
B It is weak in tension.
C Iarge structures exert a lot of pressure.
D Reinforced concrete is easy to mould.

28 The diagram shows a lever used to lift a 80 kg mass.

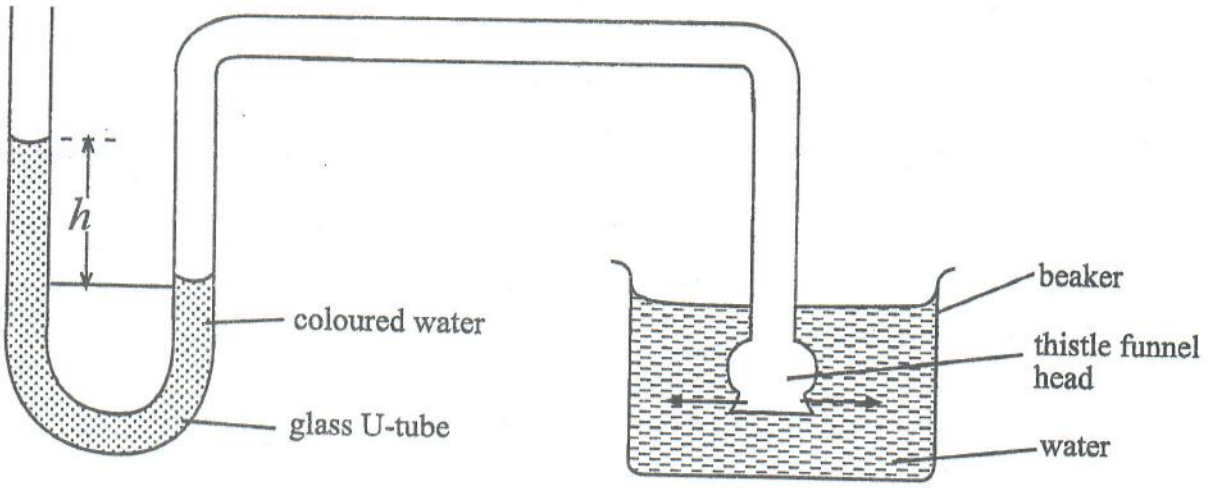


What is the effort required to lift the load?

A 20 N
B 80 N
C 200 N
D 400 N

[Turn over

29 The apparatus were used to compare pressure at different depths.



What happens to level **h** when the thistle funnel head is moved in the directions shown by the arrows?

A increases
B decreases
C decreases and increases
D remains the same

30 What property of liquids is used in the operation of hydraulic systems?

A Liquids can flow.
B Liquids prevent rust.
C Liquids cannot be compressed.
D Liquid pressure increases with depth.

31 Which of the following components of a balanced diet has no nutritional value?

A minerals
B vitamins
C fibre
D fats

32 What is the effect of taking mandrax and cannabis?

A damage to muscles
B damage to heart
C addictive
D hallucination

33 Which method of food preservation reduces the rate of bacterial breeding?

A refrigeration
B salting
C smoking
D pickling

34 What is the correct symptom and clinical treatment of cholera?

	symptoms	**treatment**
A	stomach ache	oral rehydration
B	diarrhoea	oral rehydration
C	head ache	antibiotics
D	diarrhoea	antibiotics

35 Which of the following blood components destroys bacteria?

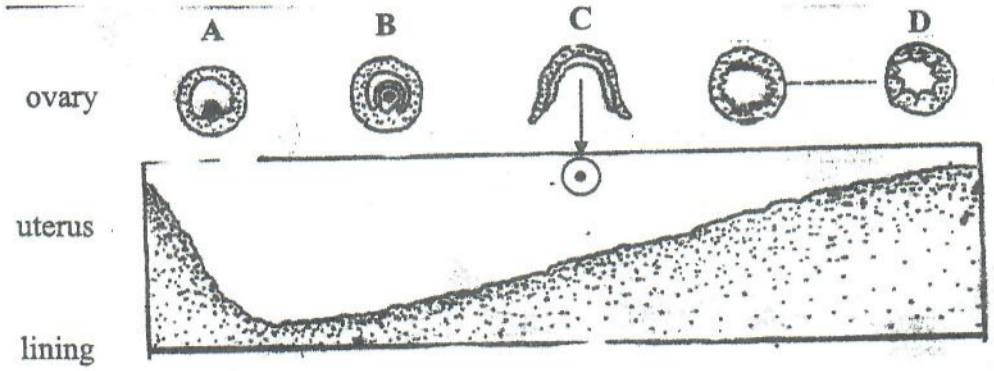
A platelets
B plasma
C white cells
D red cells

36 Which method of contraception can cause the embryo to develop in the oviduct?

A condom
B pill
C Intra Uterine Device
D sterilisation

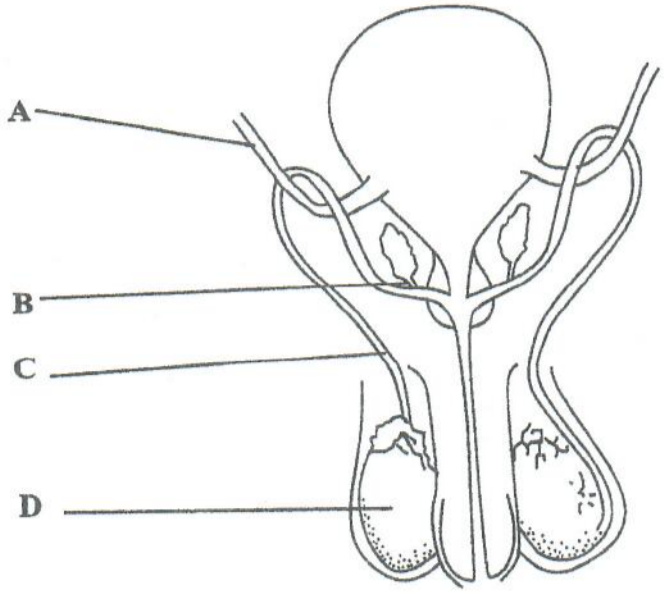
37 The diagram shows changes in the ovary and uterus in the menstrual cycle of a human.

Which stage shows ovulation?

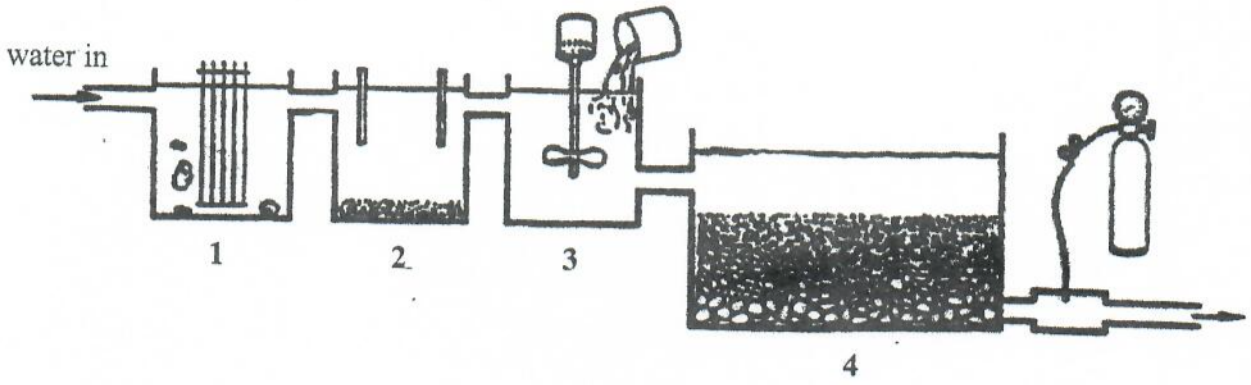


38 The diagram shows the male reproductive system.

Which part is cut during vasectomy?



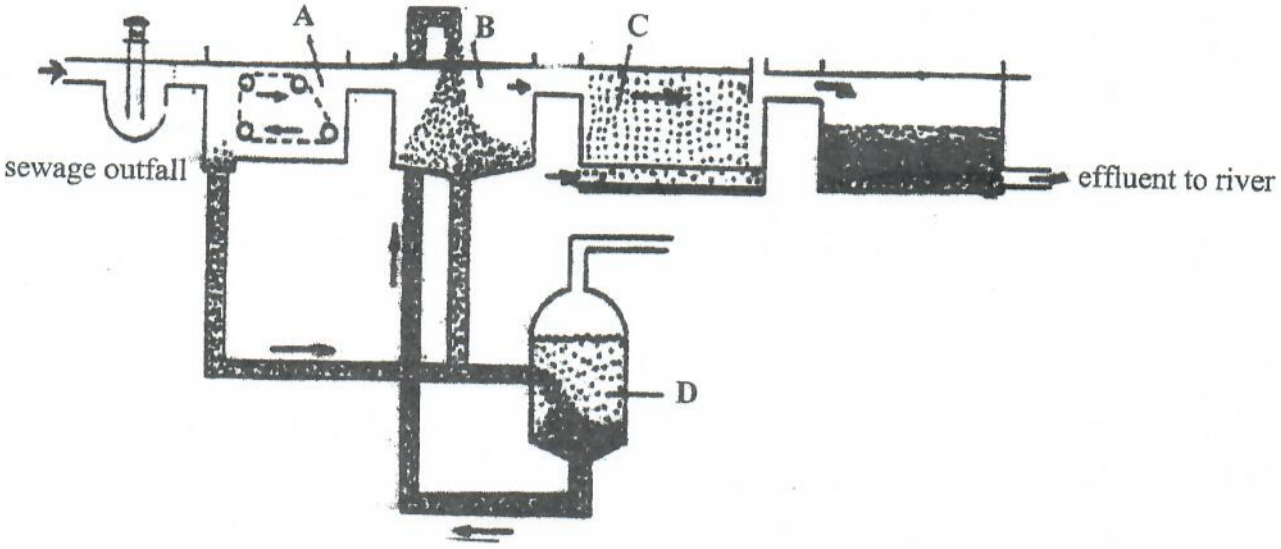
39 The diagram shows the large scale treatment of water.



What happens in stage 4?

A microorganisms are destroyed
B water is filtered
C clumping of small particles
D water is stored

40 The diagram shows activated sludge treatment of sewage. Where does anaerobic digestion take place?



ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

POSSIBLE ANSWERS

NOVEMBER 2009

INTEGRATED SCIENCE 5006/1

INTEGRATED SCIENCE – 5006/01 – NOVEMBER 2009

SUGGESTED ANSWERS

1.	B	21.	B
2.	A	22.	A
3.	C	23.	A
4.	D	24.	D
5.	D	25.	A
6.	B	26.	C
7.	A	27.	B
8.	D	28.	C
9.	B	29.	D
10.	A	30.	C
11.	C	31.	C
12.	A	32.	C
13.	B	33.	A
14.	C	34.	D
15.	D	35.	C
16.	C	36.	C
17.	C	37.	C
18.	D	38.	C
19.	B	39.	B
20.	C	40.	D

Candidate Name	Centre Number	Candidate Number

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

INTEGRATED SCIENCE 5006/2

PAPER 2

NOVEMBER 2009 SESSION 2 hours

Additional materials:
Answer paper

TIME 2 hours

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page and on all separate answer paper used.

Section A

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

Section B

Answer **all** questions.

Write your answers on the separate answer paper provided.

At the end of the examination, fasten the separate answer paper securely to the question paper.

INFORMATION FOR CANDIDATES

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

You are advised to spend no longer than 45 minutes on Section A and 1 hour 15 minutes on Section B.

FOR EXAMINER'S USE	
Section A	
Section B	
6	
7	
8	
9	
10	
TOTAL	

This question paper consists of 12 printed pages and 4 blank pages.

Section A

For Examiner's Use

*Answer **all** questions in this section in the spaces provided.*

You are advised to spend no longer than 45 minutes on this section.

1 **(a)** Aphids and locusts are plant pests. Define a *pest*.

_____

_____ [1]

(b) Name **two** major types of pests.

1. _____

2. _____ [2]

(c) How does each type of pest affect productivity in plants?

_____

_____

_____

_____

_____ [4]

(d) State **one** plant disease.

_____

_____ [1]

[Total: 8]

For Examiner's Use

2 **Table 1** shows how substances A and B affect an indicator.

Table 1

	Observations	
Indicator	**Substance A**	**Substance B**
Red litmus	remains red	remains red
Blue litmus	remains blue	turns red

(a) **(i)** State the function of the litmus as an indicator in **Table 1**.

_____

_____ [1]

(ii) What **two** conclusions can be made from **Table 1**? Explain your answer.

1. conclusion:

_____

_____

explanation:

_____

_____

2. conclusion:

_____

_____

explanation:

_____

_____ [4]

For Examiner's Use

(b) Describe what happens when magnesium oxide is added to beaker B.

_____

_____

_____ [3]

[Total:8]

3 (a) State **three** methods by which heat moves from one place to another.

1. _____

2. _____

3. _____ [3]

(b) **Fig. 1** shows an electric element heating water in a bucket.

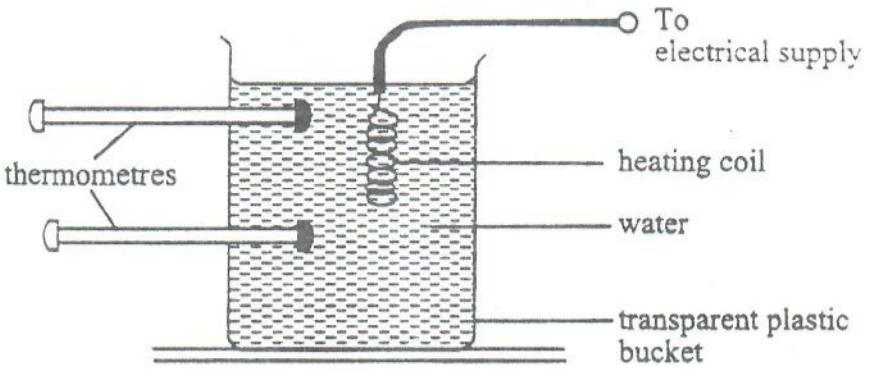


Fig. 1

(i) State the likely differences that would be observed on the thermometer reading.

_____

_____ [1]

(ii) Explain the observation in (b)(i).

For Examiner's Use

_____

_____

_____

_____ [3]

(iii) Suggest a better position for placing the element in the bucket in order to make the water boil as quickly as possible.

_____

_____ [1]

[Total: 8]

4 (a) **Fig. 2** shows **two** ways of joining materials.

Fig. 2

(i) Name the method used in **K**.

_____

_____ [1]

(ii) State **one** advantage joint **J** has over **K**.

_____

_____ [1]

For Examiner's Use

(iii) Suggest **three** ways of making joint K stronger.

1. _____

_____

2. _____

_____

3. _____

_____ [3]

(b) State **three** ways of joining wood.

_____

_____

_____

_____ [3]

[Total: 8]

5 A person who is a chain smoker was admitted in hospital because of chest problems.

The person was advised to stop smoking if he was to improve his health.

(a) (i) Define *health*.

_____

_____

_____ [2]

For Examiner's Use

(ii) Suggest possible reasons to convince the person to stop smoking.

_____

_____

_____

_____ [4]

(iii) State **two** effects of excessive consumption of alcohol.

1. _____

_____

2. _____

_____ [2]

[Total: 8]

Section B

*Answer **all** questions on the separate answer paper provided.*

6 **Fig. 3A** shows a photograph of a bee visiting a flower and **Fig. 3B** shows a section of the same flower.

Fig. 3A

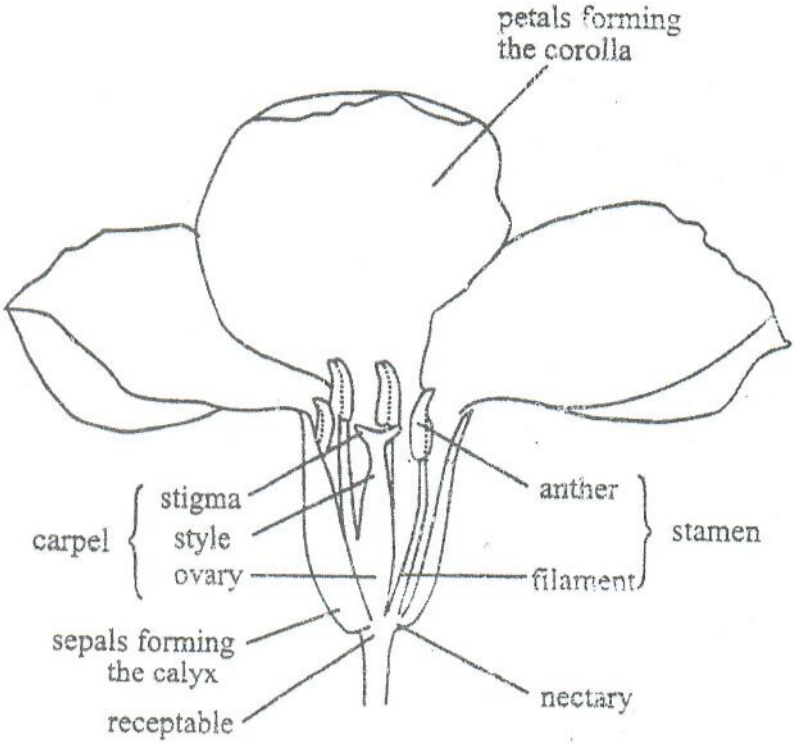


Fig. 3B

(a) Describe and explain how the flower in **Fig. 3B** is adapted for insect pollination. [8]

(b) State **two** forms of variation and identify **two** factors that cause variation in living organisms. [4]

[Total: 12]

7 Iron is extracted from iron III oxide in a blast furnace.

(a) Describe and explain differences between iron and iron III oxide. [6]

(b) **Fig. 4** shows a blast furnace.

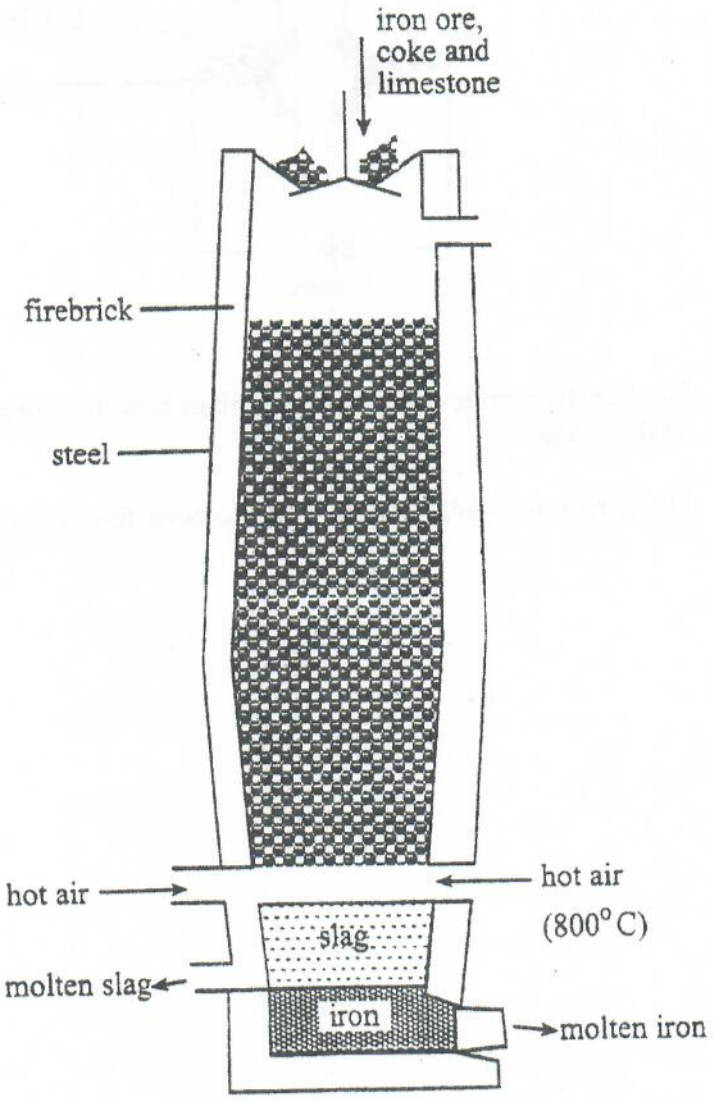


Fig 4

(i) Describe and explain the function of hot air in the extraction of iron from iron ore in **Fig. 4**. [4]

(ii) Explain why iron from the blast furnace is converted to steel. [2]

[Total: 12]

8 **Fig. 5** shows an electric motor.

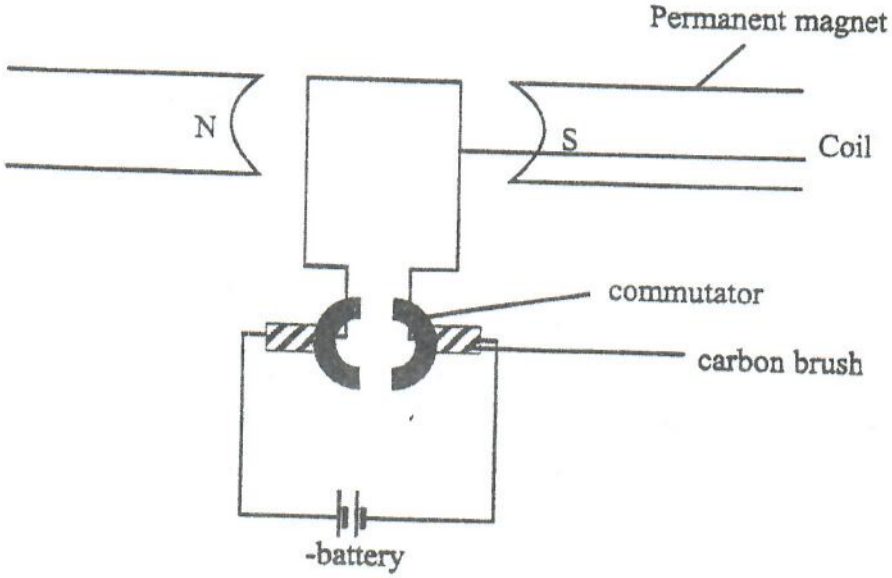


Fig 5

(a) Use the diagram to describe and explain how movement is brought about in the motor. [7]

(b) Describe how a solar cooker works to cook food at a rural police station. [5]

[Total: 12]

9 **Fig. 6** shows a pump used to pump water from a shallow well for use in a resettlement area.

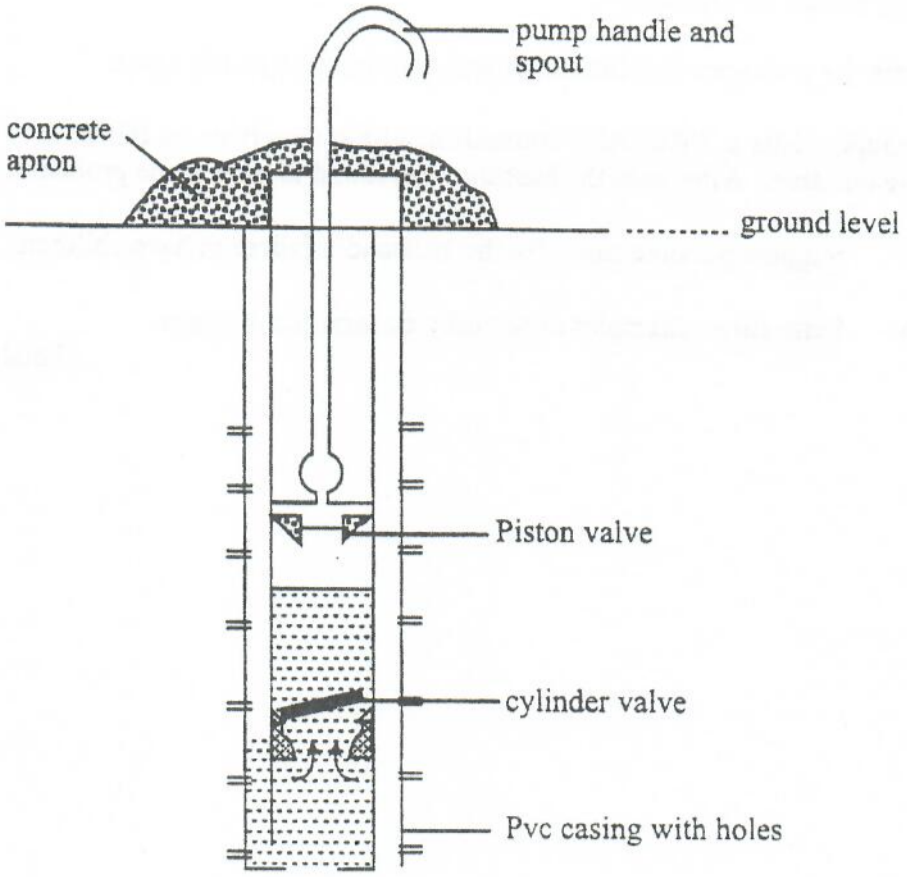


Fig 6

(a) **(i)** Name the type of pump. [1]

(ii) Using the information in the diagram, describe and explain how the pump works. [8]

(b State **three** examples of applications of fluid systems. [3]

[Total: 12]

10 (a) During the rain season, mosquitoes carrying malaria parasites affect many people in Zimbabwe.

Name the pathogen that causes malaria and describe its life cycle. [5]

(b) A couple visits a 'PROFAM' counselling clinic for advice on failure to have children. After tests the husband was found to have some problems.

(i) Suggest possible cause for the husband's failure to have children. [4]

(ii) State **three** examples of sexually transmitted diseases. [3]

[Total: 12]

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

POSSIBLE ANSWERS

NOVEMBER 2009

INTEGRATED SCIENCE 5006/2

Section A

1 (a) animal that destroy crops; [1]

(b) sap sucking; tissue eating; [2]

(c) tissue eating: destroy leaves; that produce food;
reduce productivity; [2]

sap sucking: suck food; depriving a plant of its food;
reduce productivity; [2]

(d) bacteria wilt/fungal rust; (Accept any correctly named plant disease) [1]

Total: [8]

2 (a) (i) to show if substance is an acid/base; [1]

(ii) deduction: A neutral;
explanation: no effect on red and blue litmus;

deduction: B acidic;
explanation: turns blue litmus red; [4]

(b) dissolves; reacts to produce salt; and water; [3]

Total: [8]

3 (a) conduction; convection; radiation; [3]

(b) (i) reading on top thermometer higher/reading on bottom thermometer lower; [1]

(ii) heated water particles rise;
cold particles move down;
water below remains cold; [3]

(iii) bottom of bucket; [1]

Total: [8]

4 (a) (i) Lap; [1]

(ii) Stronger; [1]

(iii) increase area of contact;
Use more rivets;
(at) many positions of joint; [3]

(b) nails;
screws;
bolts/bolts and nuts; [3]

Total: [8]

5 (a) (i) State of complete physical; mental and social well-being; [2]

(ii) causes: lung cancer;
bronchitis;
heart disease;
emphysema; [4]

(b) reduced self control;
depressant;
effect on reaction time;
liver cirrhosis;
social implication; [2]
Total: [8]

6 (a) large petals; attract insects; nectary;
produces nectar needed by insects;
anthers inside flower; to avoid wind
pollination; stigma inside flower; stigma
flat; insects pick pollen; pollen sticks to stigma;
(concept of brightly coloured petals does not apply) [8]

(b) forms: continuous; discontinuous;
causes: environmental; genetic; [4]
Total: [12]

7 (a) Iron: an element; made of one type of atom; metal;

Iron III oxide: a compound; made of two types of atoms/iron and oxygen;
chemically combined; [6]

(b) (i) provides oxygen; which reacts with coke;
producing carbon monoxide; carbon monoxide reduces/reacts
with Iron III oxide; [4]

(ii) to remove impurities; improves properties; [2]
Total: [12]

8 (a) permanent magnet has
magnetic field/N-S;
current; carrying coil;
magnetic field;
interaction of two fields;
produces motion;
commutator rings change positions;
(motion made to continue in one direction); [7]

(b) large curved reflector;
radiant energy;
falls on mirrors;
reflected;
focussed at a point;
produces heat; [5]
Total: [12]

9 (a) (i) lift pump; [1]

(ii) pump rising main moving down;
piston valve opens;
water enters pump rising main; water comes out of spout;
water in cylinder has greater pressure;
cylinder valve closes;
water below at less pressure;
pump rising main moving up;
piston valve closed;
cylinder valve opens; creates low pressure;
water enters cylinder;
greater atmosphere pressure;
award for 8 points in the correct sequence [8]

(b) siphon;
car breaking system;
hydraulic jack; [3]

Total: [12]

10 (a) Plasmodium;
multiply in mosquito (stomach);
sexually; (parasites)
vomited into human blood;
multiply in human blood;
asexually;
(1 mark for naming and 4 marks for the description of the life cycle). [5]

(b) (i) low sperm count;
poor quality of sperms;
damage by STIs;
cancer; [4]

(ii) chancroid;
gonorrhoea;
syphilis;
HIV/AIDS;
(Accept any correct STD up to a maximum of 3) [3]

Total: [12]

Candidate Name

Centre Number

Candidate Number

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

INTEGRATED SCIENCE

PAPER 3

5006/3

NOVEMBER 2009 SESSION

1 hour

Candidates answer on the question paper

Additional materials:

Soft pencil (type B or HB is recommended)
Soft clean eraser
Ruler (cm/mm)
Mathematical tables/calculator

Time 1 hour

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page.
Answer **all** questions.
Write your answers in the spaces provided on the question paper.

INFORMATION FOR CANDIDATES

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

FOR EXAMINER'S USE	
1	
2	
3	
4	
TOTAL	

This question paper consists of 9 printed pages and 7 blank pages.

[Turn over

1 **Fig. 1** shows an experiment set up to investigate photosynthesis using a pond weed.

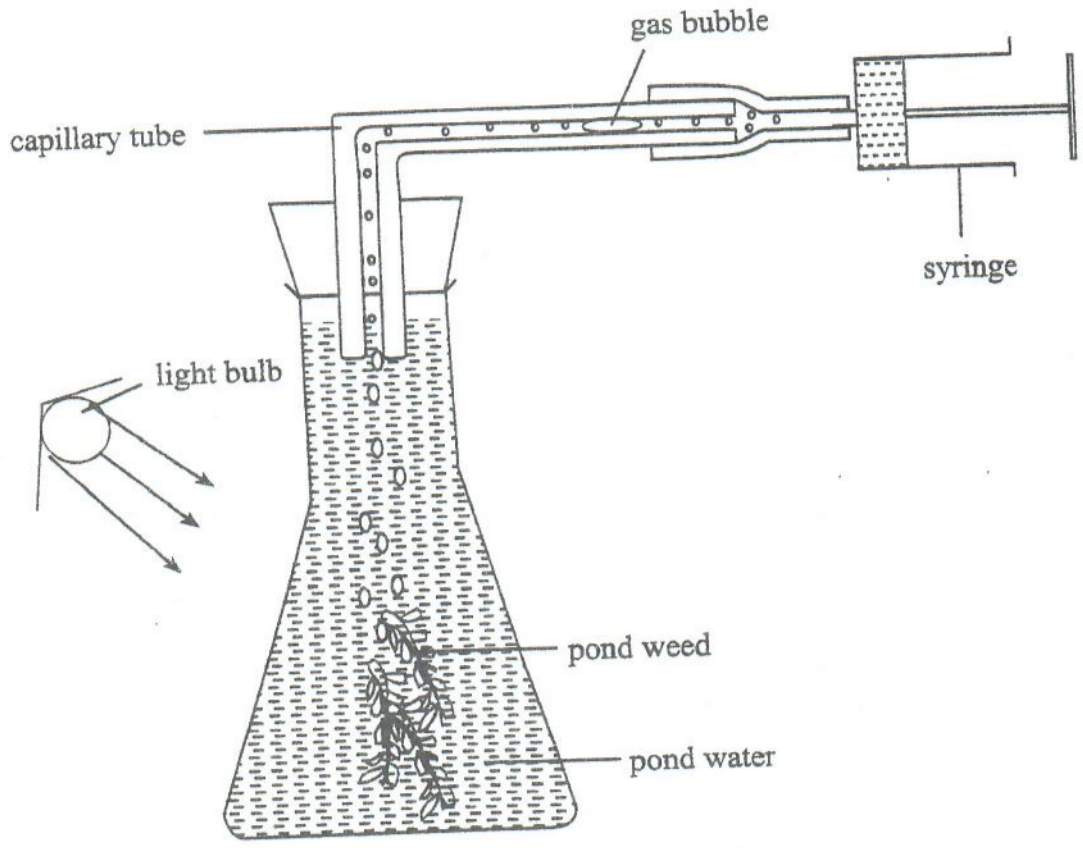


Fig. 1

(a) **(i)** Name the gas that is collected in the capillary tube.

_____ [1]

(ii) Describe the test for this gas.

_____

_____ [2]

For Examiner's Use

(b) The pond weed was exposed to light from bulbs of different power for 10 minutes at a time and the gas released collected. **Fig. 2** shows the lengths of bubbles of the gas collected per bulb.

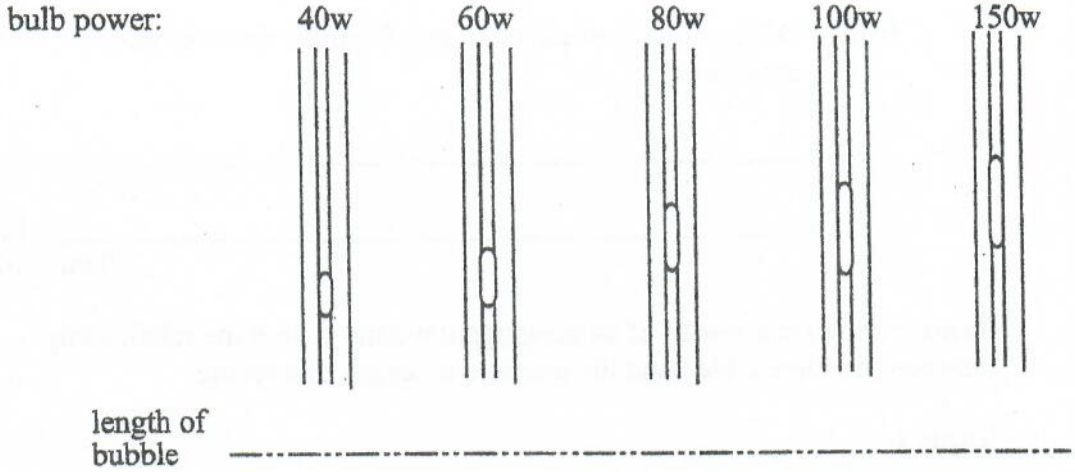


Fig. 2

(i) Measure and record the lengths of the bubbles in a suitable table in the space below. [5]

(ii) Estimate the length of the gas bubble produced at 90W.

_____ [1]

(iii) What conclusion can be drawn from the result of this experiment?

_____

_____ [1]

[Total: 10]

2 **Table 1** shows the results of an investigation done to find the relationship between the force added and the increase in length of a spring.

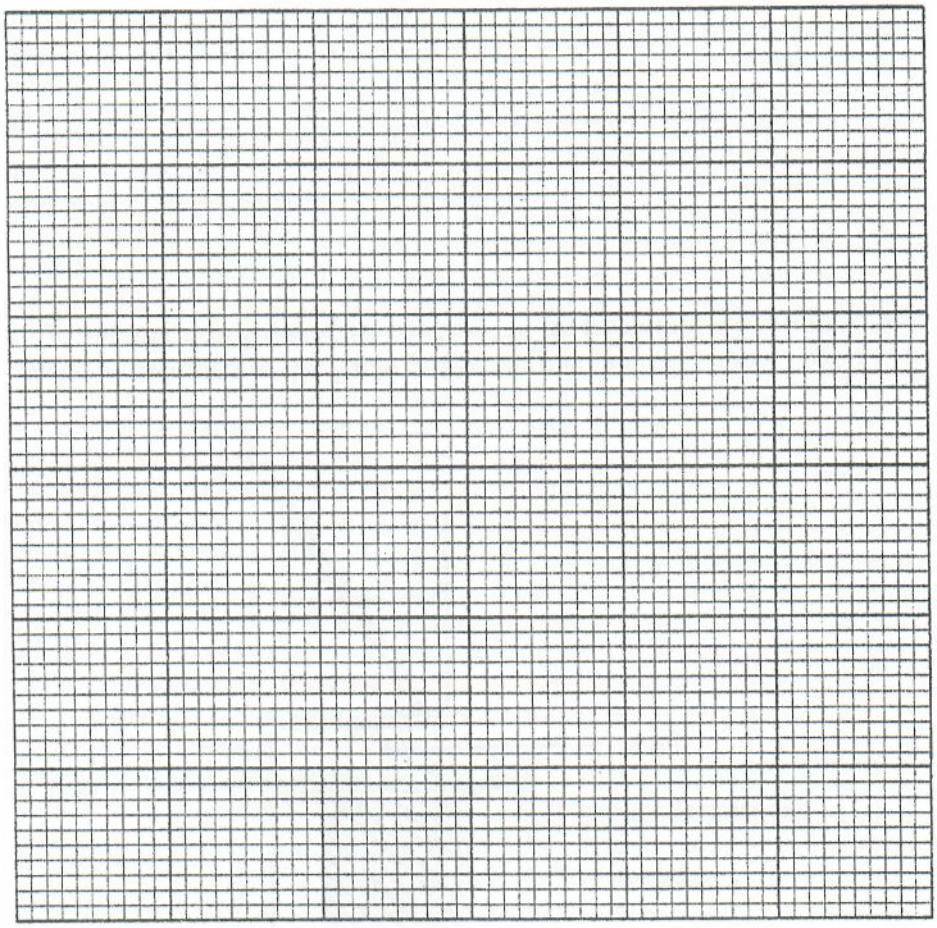
Table 1

force/N	length/cm	increase in length/cm
0	5.00	0
10	5.50	0.5
20	6.00	
30	6.50	1.5
40	7.00	2.0
50	7.50	

(a) Complete the missing values of increase in length in **Table 1**. [2]

For Examiner's Use

(b) **(i)** Plot a graph of increase in length (y-axis) against force on the grid. [3]



(ii) Use your graph to determine the increase in length if the force applied was 35 N. [1]

(iii) What property of a metal does the increase in length show?

_____ [1]

(c) What is the relationship between the force applied and the increase in length of the piece of wire?

_____

_____ [1]

(d) State and explain what would happen if a force of 100 N was added to the wire.

_____

_____

_____ [2]

3 **Fig. 3** shows apparatus set up to compare the heating efficiencies of wet wood, wood charcoal and dry wood using equal volumes of water.

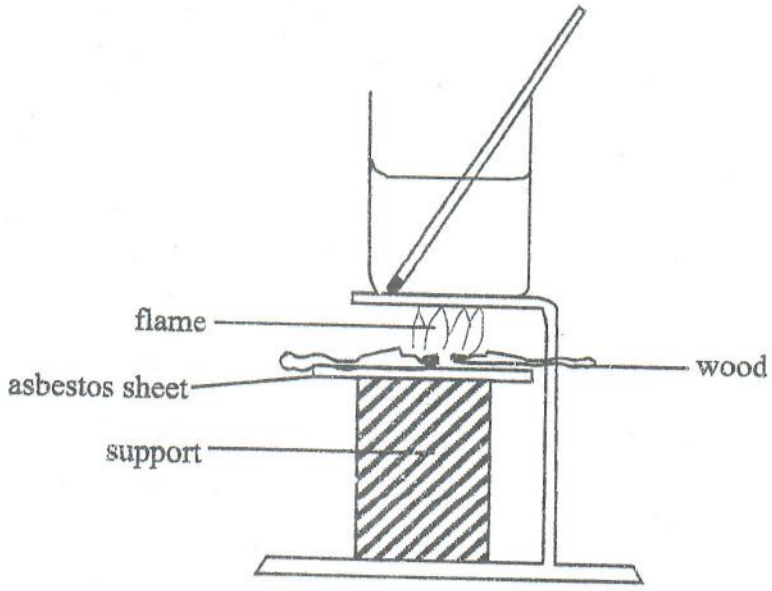


Fig. 3

(a) To carryout the experiment accurately what other two factors needs to be in equal quantities?

1. _____

2. _____ [2]

For Examiner's Use

(b) At the beginning of the experiment, the temperature of the water was 25°C. **Table 2** gives the temperature rises of water caused by each fuel at the end of the experiment.

Table 2

fuel	temperature rise °C	final temperature °C
wet wood	16	
charcoal	34	
drywood	18	

(i) Calculate the final temperature for each fuel and complete **Table 2.** [3]

(ii) What conclusion can be drawn from the results of this experiment?

_____

_____

_____ [2]

(c) (i) What additional apparatus is needed in **Fig.3** that would help to make the results more reliable?

_____

_____ [2]

(ii) State **one** possible way heat from the fuels may be lost to the surroundings.

_____ [1]

[Total: 10]

4 **Fig. 4** shows results of an experiment set up to investigate changes that take place during germination of seeds. The seeds used were of the same type and same amount.

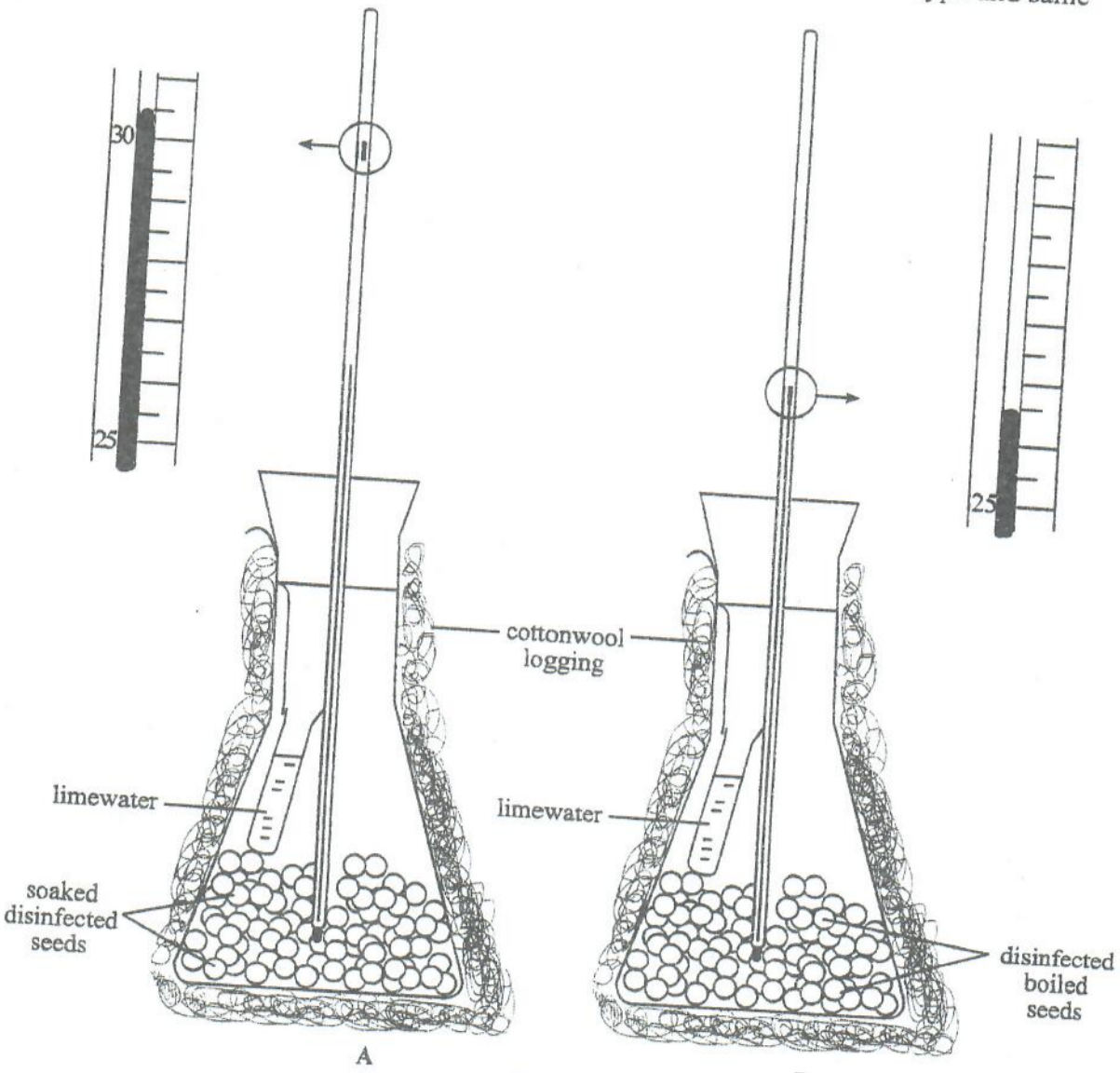


Fig. 4

(a) (i) Why was it necessary to have the same amount of seeds in the two flasks?

_____ [1]

(ii) Why were the flasks covered with cotton wool lagging?

_____ [1]

(iii) What was the purpose of disinfecting the seeds?

_____ [1]

For Examiner's Use

(b) (i) Read and record the temperature of the two flasks.

flask A _____

flask B _____ [2]

(ii) Give an explanation for the temperature differences observed.

_____

_____ [2]

(c) (i) During germination, carbon dioxide is released. State with a reason in which flask lime water turned milky.

_____ [2]

(ii) What is the biological process involved during seed germination?

_____ [1]

[Total: 10]

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

POSSIBLE ANSWERS

NOVEMBER 2009

INTEGRATED SCIENCE

5006/3

1 (a) (i) oxygen/O_2 [1]

(ii) Dip/insert glowing splint in gas; [1]
re-lights a glowing splint; [1]

(b) (i)

Bulb power (W)	40	60	80	100	150
Length of bubble (mm)	5	7	9	12	12

[5]

(ii) 10 mm; [1]

(iii) As light intensity increases more gas (oxygen) is released; [1]

2 (a) (i) 20 N - 1
50 N - 2.5 [2]

Total [10]

(b) (i) both axes correctly labelled;
continuous scale covering more than 75% graph space;
all points joined with a line; [3]

(ii) 1.75 cm [1]
(iii) elasticity; [1]

(c) Increase in length is directly proportional to force applied/
As force applied increases, increase in length also occurs; [1]

(d) Wire breaks/permanently deformed; [1]
It has exceeded/reached the elastic limit; [1]

3 (a) equal heating times; equal masses of solid fuels; (2)

Total [10]

(b) (i) wet wood - 41°C;
charcoal - 59°C;
dry wood - 43°C; [3]

(ii) charcoal followed by dry wood; has a higher heating efficiency; [2]

(c) (i) Wind/draught shield; and stirrer; [2]

(ii) radiation/convection current; [1]

Total [10]

4 (a) (i) For a reliable comparison/to obtain reliable results; [1]

(ii) To prevent heat loss/gain [1]

(iii) To prevent fungus/bacteria decomposing the soaked seeds; [1]

(b) (i) Flask A - 30.5°C; Flask B - 26.5°C [2]

(ii) In A seeds germinated but in B they were dead/did not germinate; germinating seeds in A generated heat as they respired; [2]

(c) (i) In A; because during respiration carbon dioxide is released; [2]

(ii) respiration; [1]

Total [10]

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

INTEGRATED SCIENCE

5006/1

PAPER 1 Multiple Choice

JUNE 2010 SESSION

1 hour

Additional materials:
- Multiple Choice answer sheet
- Soft clean eraser
- Soft pencil (type B or HB is recommended)

TIME 1 hour

INSTRUCTIONS TO CANDIDATES

Do not open this booklet until you are told to do so.
Write your name, Centre number and candidate number on the answer sheet in the spaces provided unless this has already been done for you.

There are **forty** questions in this paper. Answer **all** questions. For each question there are four possible answers, **A, B, C** and **D**. Choose the **one** you consider correct and record your choice in **soft pencil** on the separate answer sheet.

Read very carefully the instructions on the answer sheet.

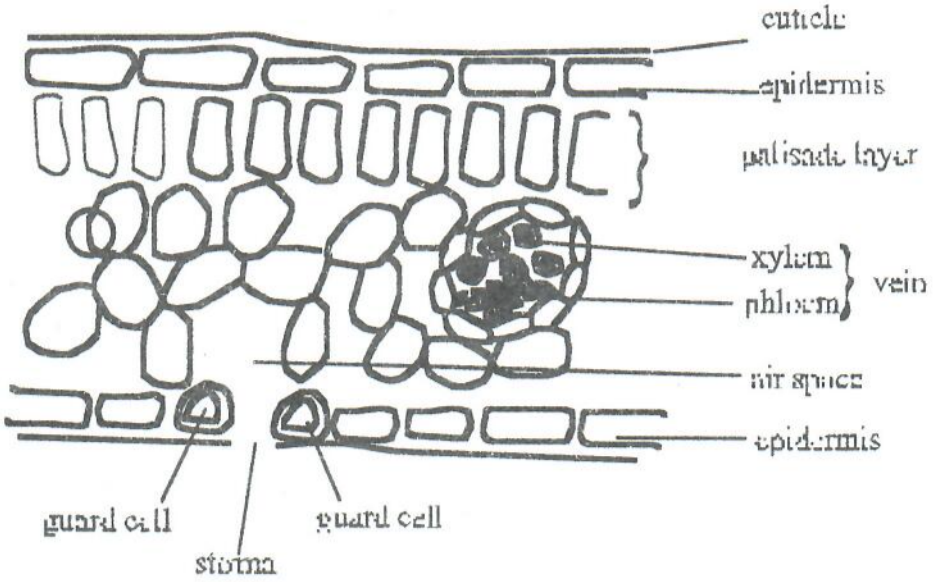
INFORMATION FOR CANDIDATES

Each correct answer will score one mark. A mark will not be deducted for a wrong answer. Any rough working should be done in this booklet.

This question paper consists of 18 printed pages and 2 blank pages.

[Turn over

1 The diagram shows a leaf.



How is the leaf adapted for photosynthesis?

A small surface area
B thick cuticle
C no stomata on upper surface
D large air space

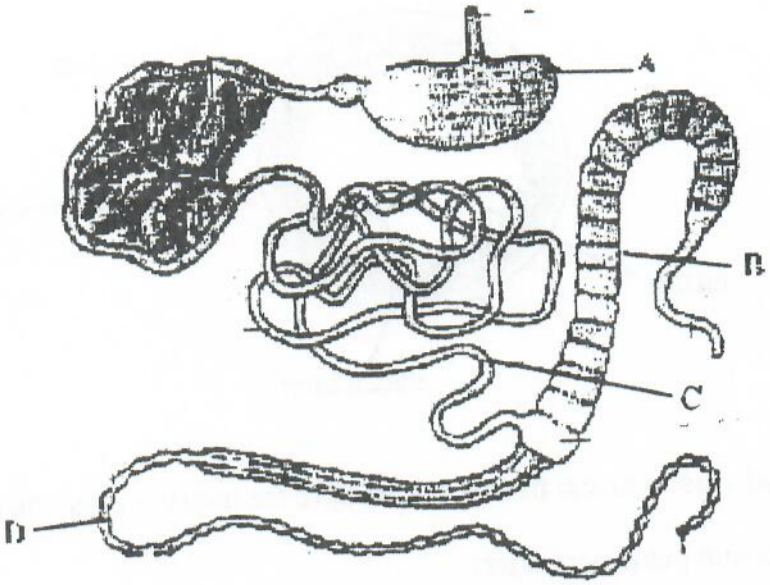
2 What would be the effect of deficiency of phosphorus on plant growth?

A stunted growth
B poor flowering
C premature death
D poor root growth

3 What does a red triangle on a pesticide container mean?

A slightly poisonous
B poisonous
C very poisonous
D extremely poisonous

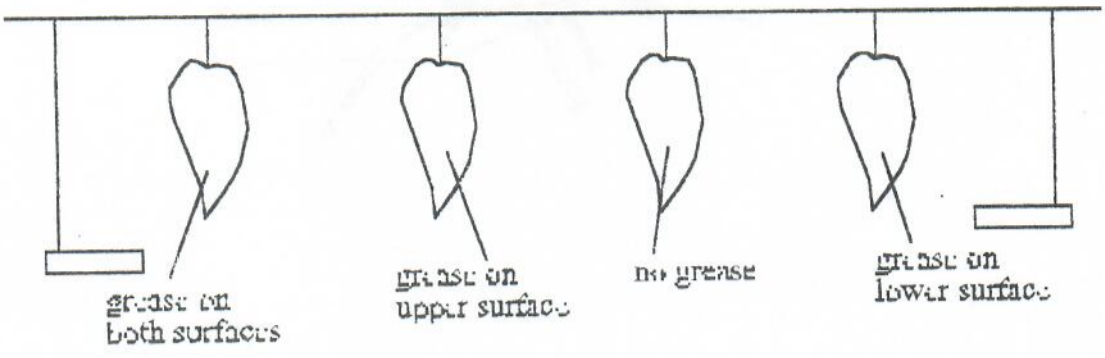
4 The diagram shows the digestive system of a rabbit. Where is cellulose digested?



5 What is the correct percentage composition of inhaled air?

	% nitrogen	% oxygen	% carbon dioxide
A	76	20	4
B	80	16	4
C	80	20	0,03
D	84	16	0,03

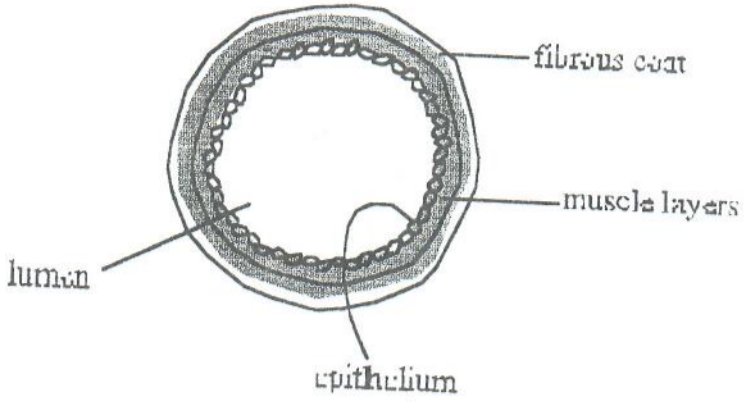
6 The diagram shows an experiment on transpiration.



Which factor affecting rate of transpiration is being investigated?

A humidity
B stomata
C temperature
D wind

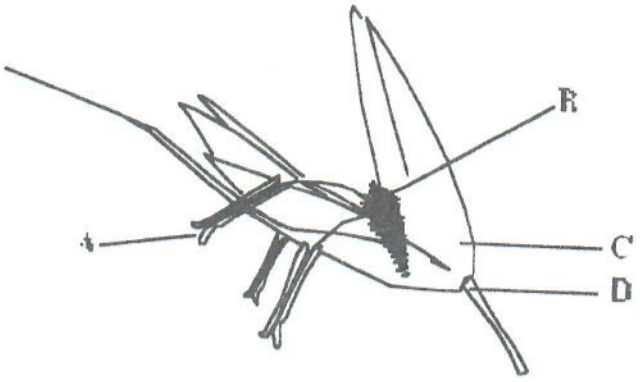
7 The diagram shows a transverse section of a blood vessel.



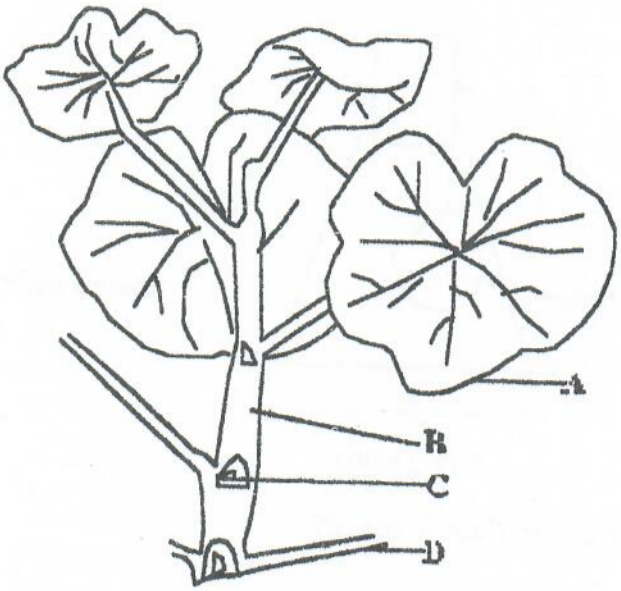
Which blood vessels to and from the heart have the transverse section shown?

A aorta and pulmonary artery
B aorta and pulmonary vein
C vena cava and pulmonary artery
D vena cava and pulmonary vein

8 The diagram shows a wind pollinated flower. Which part is the stigma?



9 **The diagram shows a plant which can reproduce vegetatively. Which structure is used by this plant in this type of reproduction?**



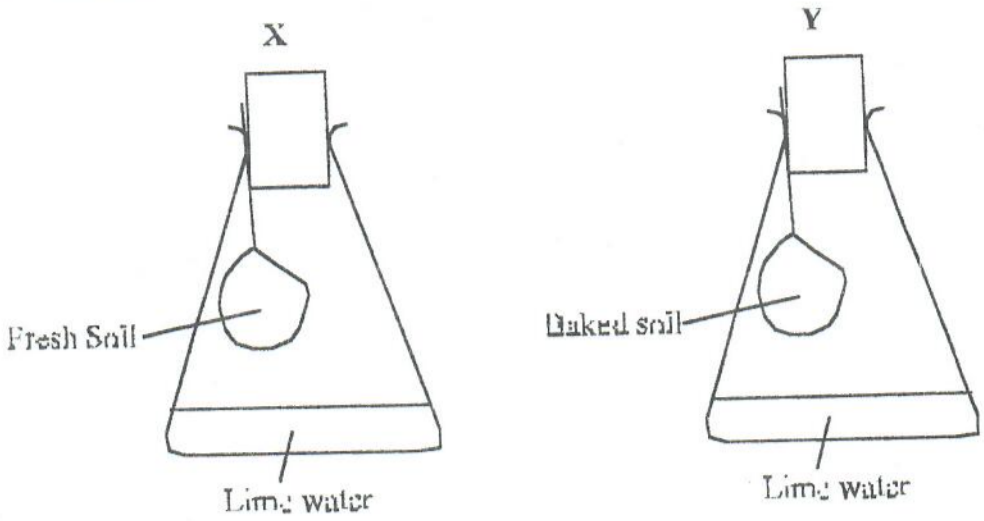
10 Which characteristic in human-beings is determined by both environmental and genetic factors?

A sex
B height
C tongue rolling
D right or left handedness

11 What will reduce variation of organisms from generation to generation?

A artificial selection
B natural section
C cross breeding
D in-breeding

12 The diagram shows an experiment to investigate components of a soil sample.



Why is the soil in flask **Y** baked?

A to remove air
B to evaporate water
C to burn humus
D to kill microorganisms

13 Which group of organisms is linked to all organisms in a food chain?

A producers
B carnivores
C herbivores
D decomposers

14 Which would be the best farming activities for marginal areas in Zimbabwe (regions 4 and 5)?

A cattle ranching and growing maize.
B cattle ranching and growing cotton.
C game ranching and growing maize.
D game ranching and growing millet.

15 What is the positive particle found in an atom?

A electron
B neutron
C nucleus
D proton

16 Which is a chemical change?

A iodine turning into a gas
B ice turning into water
C water separating into oxygen and hydrogen
D liquid air separating into oxygen and nitrogen

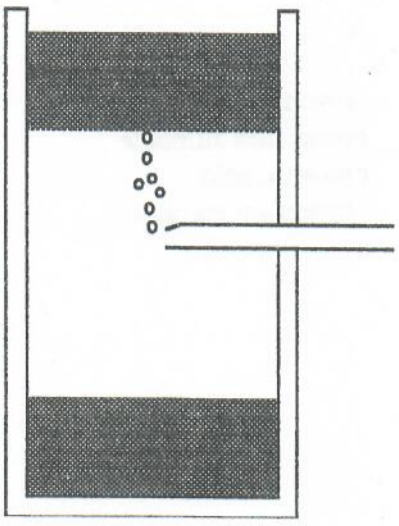
17 The equation shows a reaction.

X + **Y** → salt + hydrogen

What are **X** and **Y**?

	X	**Y**
A	acid	base
B	acid	metal
C	base	water
D	base	non-metal

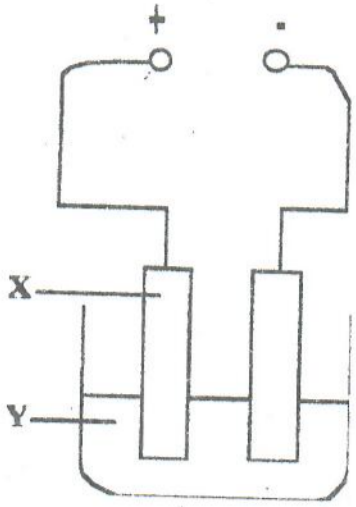
18 The diagram shows a process used in the extraction of copper from its ore.



What is this process called?

A floatation
B reduction
C roasting
D sintering

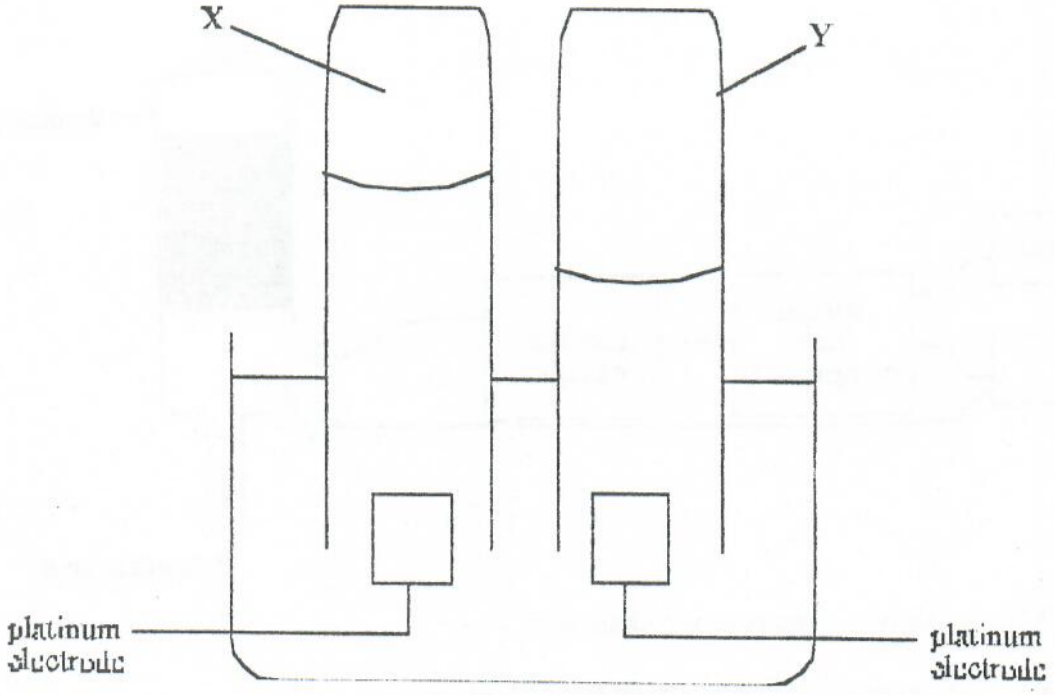
19 The diagram shows apparatus used in chromium plating.



What are X and Y?

	X	Y
A	chromium cathode	chromic acid
B	chromium cathode	chromium sulphate
C	lead anode	chromic acid
D	lead cathode	chromium sulphate

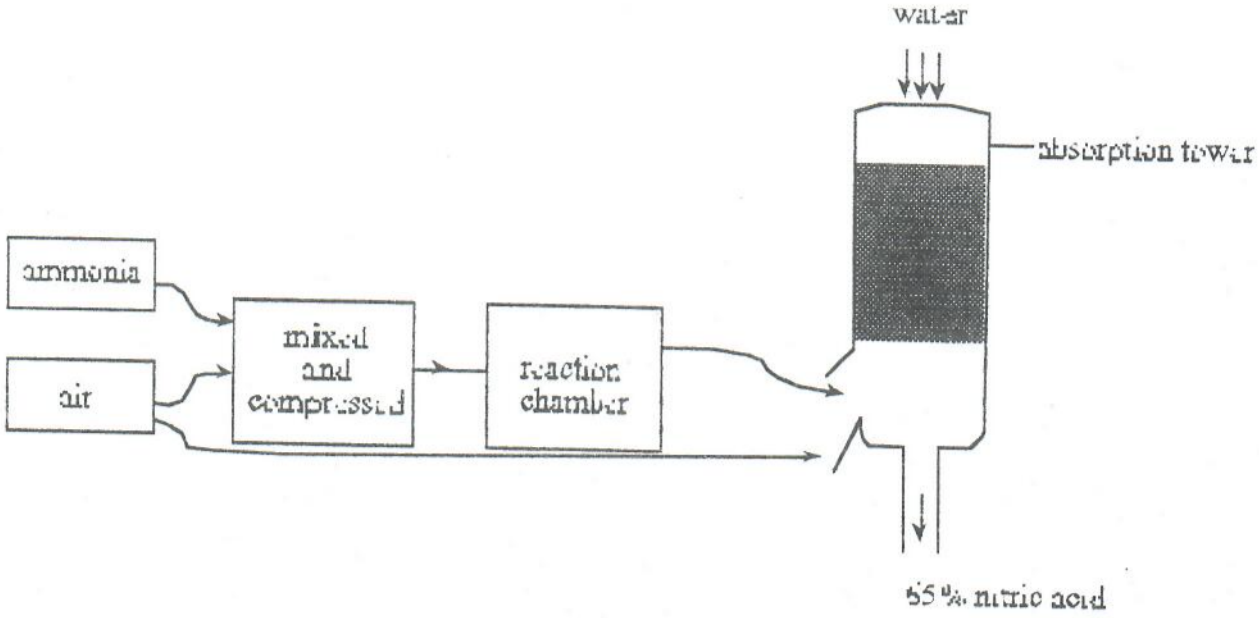
20 The diagram shows the electrolysis of acidified water.



In the electrolysis, 20 cm^3 of gas is collected in tube **X**. What is the volume and identity of the gas collected in tube **Y**

	Gas	Volume
A	hydrogen	20 cm^3
B	hydrogen	40 cm^3
C	oxygen	20 cm^3
D	oxygen	40 cm^3

21 The flow chart shows the manufacture of nitric acid.



What is true about the reaction chamber?

A A pressure of 200 atmospheres is applied.
B The catalyst vanadium pentoxide is used.
C A temperature of 900°C is maintained.
D Nitrogen and oxygen form nitrogen dioxide.

22 Which is the **main** product of destructive distillation of coal?

A benzol
B ammonia
C coke
D bitumen

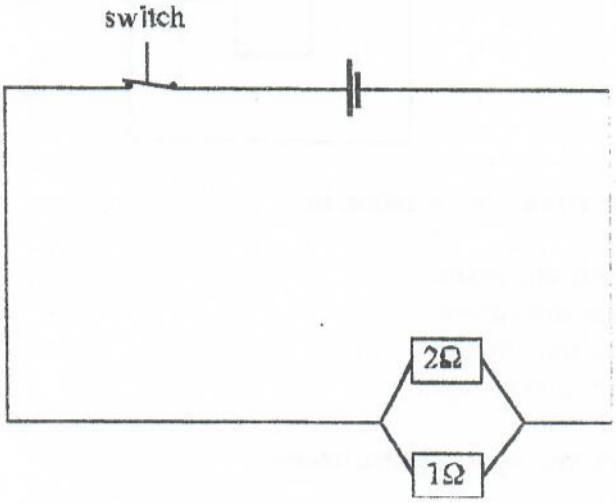
23 Which gas is obtained from the fermentation of glucose?

A carbon dioxide
B hydrogen
C nitrogen
D oxygen

24 What is the difference between a diesel and a petrol engine?

	Diesel	Petrol
A	fuel taken in during intake	fuel taken in after compression
B	air-fuel mixture compressed	air compressed
C	more compression	less compression
D	spark ignites fuel	fuel ignites on its own

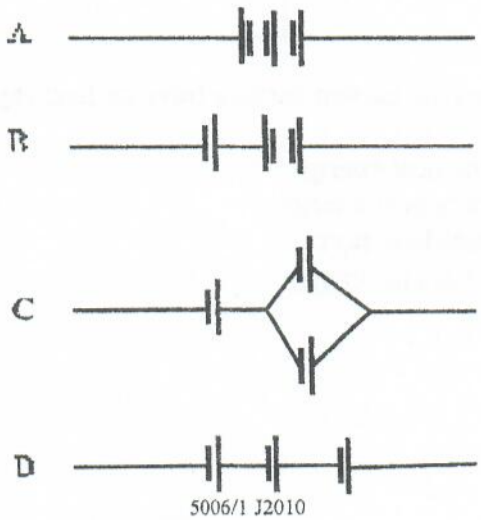
25 The diagram shows part of an electric circuit.



Which is the total resistance in the circuit?

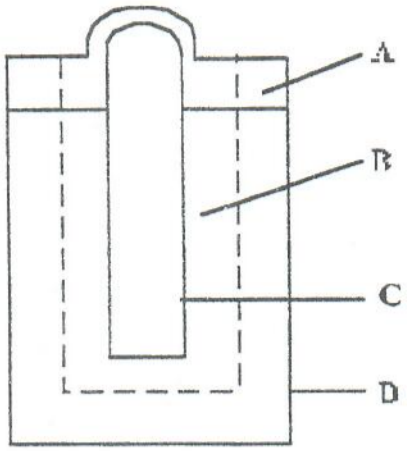
A 0.67Ω
B 1.50Ω
C 2.00Ω
D 3.00Ω

26 Which arrangement of cells will produce the highest voltage?



[Turn over

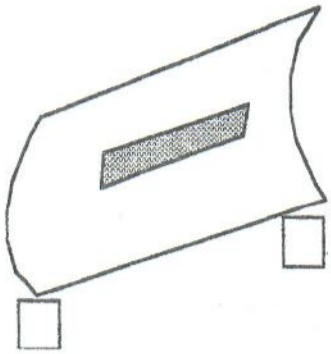
27 The diagram shows a dry cell. Which part is the positive electrode?



28 Heat energy travels by radiation in

A liquids and gases.
B gases and vacuum.
C gases and liquids.
D solids and vacuum.

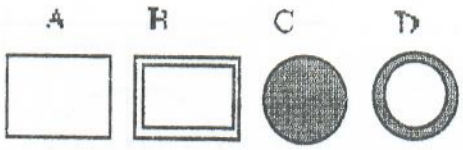
29 The diagram shows an electric heater



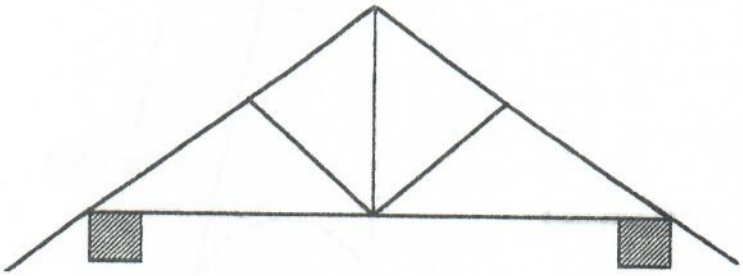
What effect does the curved surface have on heat rays?

A It absorbs heat energy.
B It conducts heat energy.
C It diverges heat rays.
D It converges heat rays.

30 The diagram shows different types of beams. Which beam is equally strong in all directions?



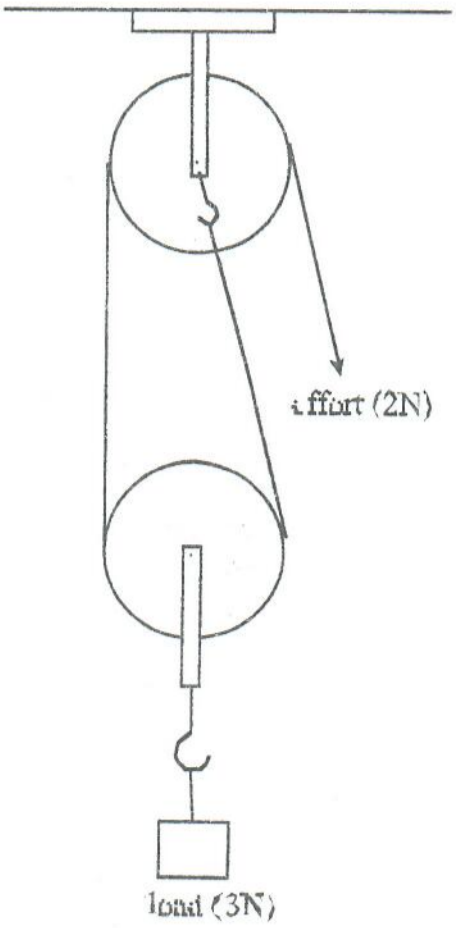
31 The diagram shows a mild steel truss.



How are the beams **best** joined?

A riveted
B bolted
C welded
D screwed

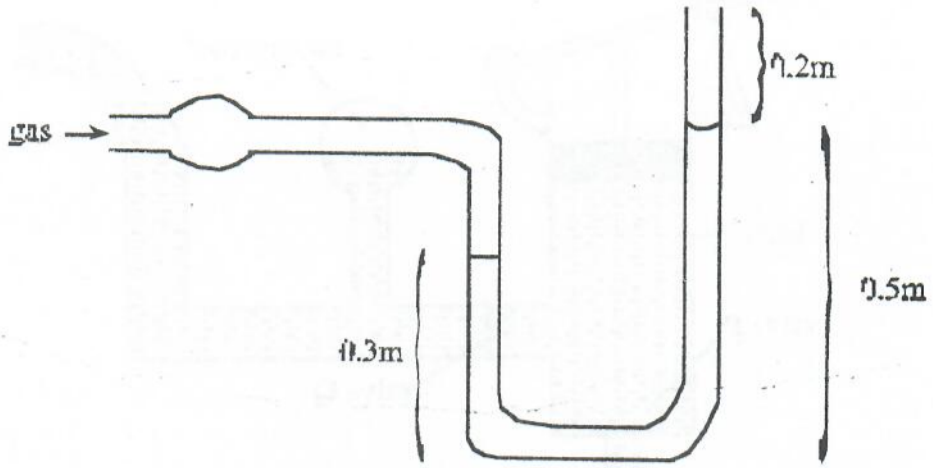
32 The diagram shows a pulley system in operation.



What is the efficiency of the system?

A 25%
B 50%
C 67%
D 75%

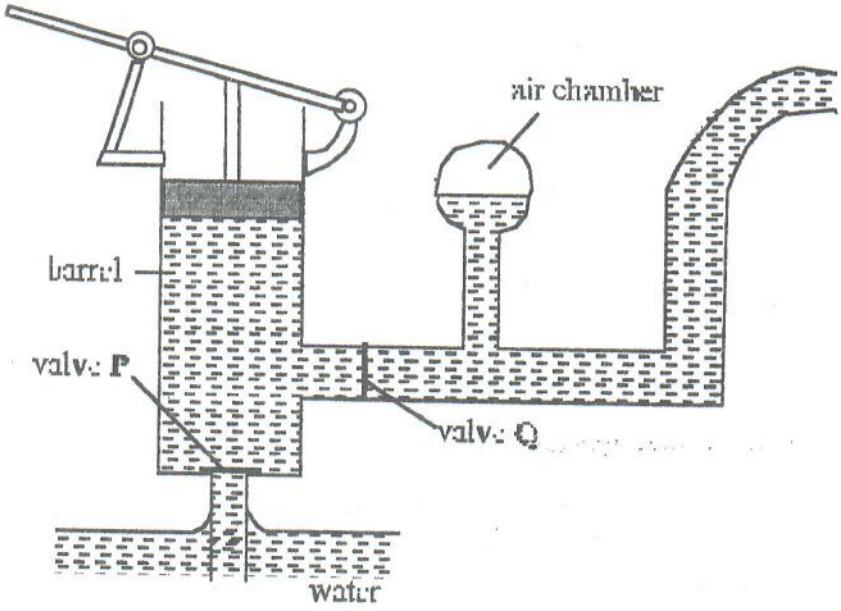
33 The diagram shows apparatus used to measure pressure of a gas.



What is the pressure of the gas if atmospheric pressure is equal to Q?

A Q+ (0.5m × density × g)
B Q+ (0.4m × density × g)
C Q+ (0.3m × density × g)
D Q+ (0.2m × density × g)

34 The diagram shows a force pump.



What happens when the handle is pulled up?

A The piston moves down, valve **P** closes and valve **Q** opens.
B Valve **P** closes and the piston moves up.
C Valve **Q** opens and water enters the barrel.
D Water enters the barrel and air chamber.

35 Which food types are required for growth and protection against diseases?

A carbohydrates and fats
B carbohydrates and proteins
C fats and minerals
D protein and vitamins

36 What is the effect of prolonged and excessive consumption of alcohol?

A hallucination
B heart disease
C liver cirrhosis
D damage to muscles

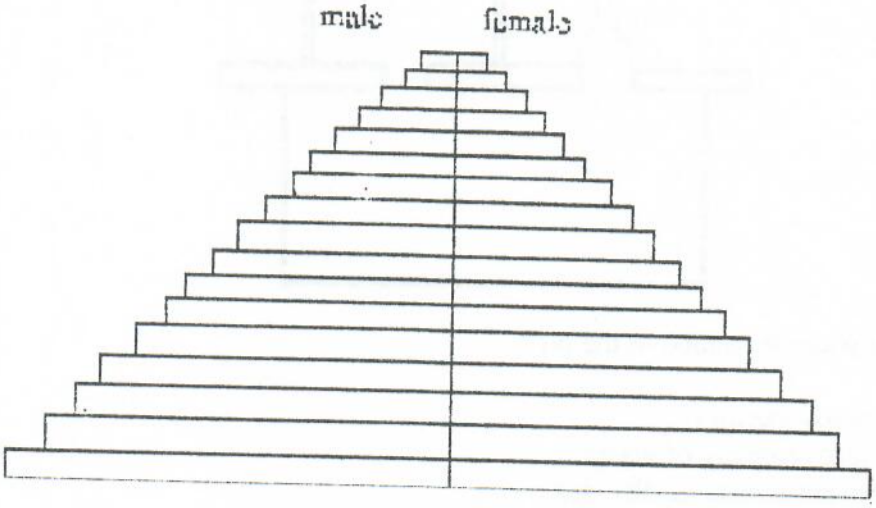
37 Which disease is spread through contact with an infected person?

A cholera
B gonorrhoea
C malaria
D tuberculosis

38 Which type of immunity is acquired by babies through breast feeding?

A artificial active
B artificial passive
C natural active
D natural passive

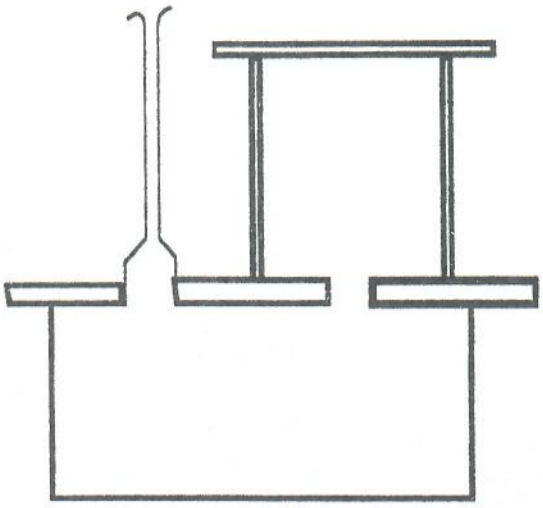
39 The diagram shows a population pyramid.



The pyramid shows that

A the population is growing.
B death rate is low.
C there are more males than females.
D death rate is higher than birth rate.

40 The diagram shows a cross section of a blair pit toilet.



Why should water be added to the pit?

A to destroy vectors
B to improve decay of waste
C to prevent spread of diseases
D to prevent bad smell from the toilet

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

POSSIBLE ANSWERS

JUNE 2010

INTEGRATED SCIENCE 5006/1

INTEGRATED SCIENCE – 5006/01 – JUNE 2010

SUGGESTED ANSWERS

1.	D	21.	C
2.	D	22.	C
3.	C	23.	A
4.	B	24.	C
5.	C	25.	B
6.	B	26.	D
7.	D	27.	C
8.	B	28.	D
9.	A	29.	D
10.	B	30.	D
11.	D	31.	B
12.	D	32.	A
13.	D	33.	D
14.	D	34.	A
15.	D	35.	D
16.	C	36.	C
17.	B	37.	B
18.	A	38.	D
19.	C	39.	A
20.	B	40.	B

Candidate Name	Centre Number	Candidate Number

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

INTEGRATED SCIENCE 5006/2

PAPER 2

JUNE 2010 SESSION 2 hours

Additional materials:
Answer paper

TIME 2 hours

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page and on all separate answer paper used.

Section A

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

Section B

Answer **all** questions.

Write your answers on the separate answer paper provided.

At the end of the examination, fasten the separate answer paper securely to the question paper.

INFORMATION FOR CANDIDATES

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

You are advised to spend no longer than 45 minutes on Section A and 1 hour 15 minutes on Section B.

FOR EXAMINER'S USE	
Section A	
Section B	
6	
7	
8	
9	
10	
TOTAL	

This question paper consists of 9 printed pages and 3 blank pages.

[Turn over

For Examiner Use

Section A

*Answer **all** questions in this section in the spaces provided.*

You are advised to spend no longer than 45 minutes on this section.

1 **Fig. 1** shows the human respiratory system.

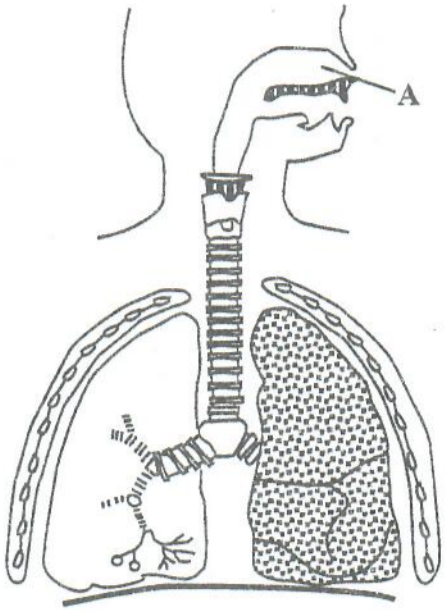


Fig. 1

(a) **(i)** Name part **A**.

_____ [1]

(ii) State **three** functions of part **A**.

1. _____

2. _____

3. _____ [3]

For Examiner's Use

(b) **Table 1** shows the chemical composition of inhaled and exhaled air.

Table 1

gas	inhaled	exhaled
oxygen	20.71%	14.6%
carbon dioxide	0.04%	4.0%
water vapour	1.25%	5.9%

(i) Name the part of the human respiratory system where gaseous exchange occurs.

_____ [1]

(ii) With reference to **Table 1** explain **three** changes which occur to the air we breathe in.

change 1

_____

_____

change 2

_____

_____

change 3

_____

_____ [3]

[Total: 8]

For Examiner's Use

2 (a) (i) State the meaning of the term *reversible reaction.*

_____

_____

_____ [2]

(ii) **Table 2** shows industrial reactions and catalysts. Complete the table.

Table 2

reaction	catalyst
1	iron
conversion of sulphur dioxide into sulphur trioxide	2
3	platinum /rhodium

[3]

(b) Explain why dilute hydrochloric acid reacts faster with powdered zinc than with granulated zinc.

_____

_____

_____

_____ [3]

[Total :8]

3 **Fig. 2** shows a balloon being rubbed on a woolen sweater to create charges on the surfaces. The balloon becomes negatively charged.

For Examiner's Use

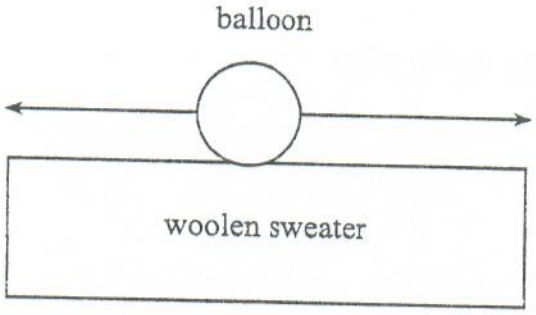


Fig. 2

(a) **(i)** On the diagram show the distribution of charges on the balloon and woolen sweater. [2]

(ii) Explain why static electricity forms much easily when the air is dry.

_____

_____

_____ [3]

(b) List **three** safety precautions against lightning when indoors.

precaution 1.

_____

_____

precaution 2.

_____

_____

precaution 3.

_____

_____ [3]

Total [8]

For Examiner Use

4 A load is raised by a lever machine in which an effort of 15N moves 1.0 m. Work done on the load is 10 joules.

(a) Calculate

1. work done by the effort.

[2]

2. efficiency.

[2]

(b) **(i)** Name **two** factors that reduce the efficiency of machines.

1. _____

2. _____

_____ [2]

(ii) State ways of overcoming factors named in **(b)(i)**.

factor 1. _____

_____

factor 2. _____

_____ [2]

[Total: 8]

For Examiner's Use

5 **Fig. 3** shows a process which occurs in the body of a woman.

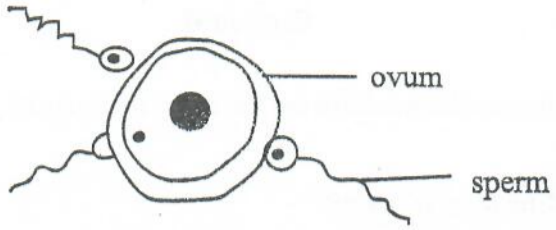


Fig. 3

(a) (i) Identify the process.

_____ [1]

(ii) Describe the process.

_____

_____ [1]

(b) Name **one** example of each kind of contraceptive listed below and **explain** how it works.

barrier method.

_____

explanation

_____

natural method.

_____

explanation

_____

_____

_____ [6]

[Total: 8]

Section B

*Answer **all** questions on the separate answer paper.*

6 **(a)** **(i)** Define *transpiration.* [2]

(ii) Describe **two** functions of transpiration. [3]

(b) Explain why a maize crop wilts on a windy, dry and sunny day. [7]
[Total: 12]

7 **(a)** **(i)** Name the elements which make-up ammonia. [2]

(ii) Describe the Haber process. [6]

(b) Sable Chemical Company was intentionally sited near Sebakwe River and ZESA grid is nearby. Explain. [4]
[Total: 12]

8 **Fig.** 4 shows a simple generator.

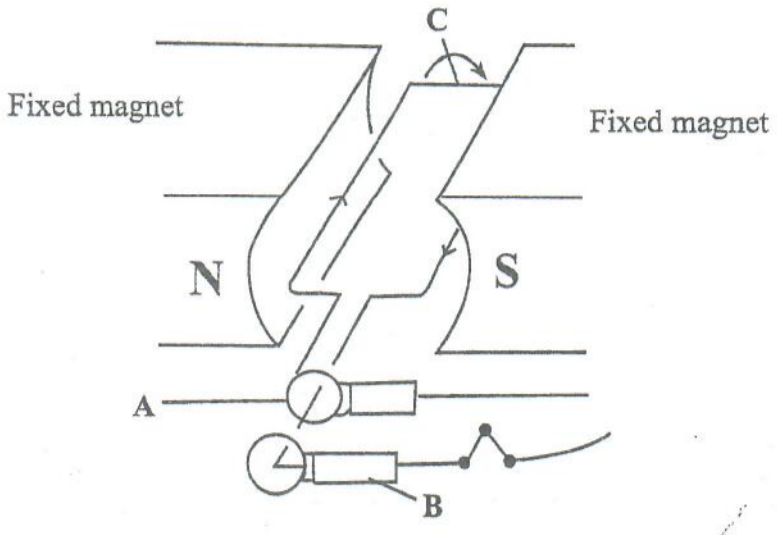


Fig. 4

(a) Name the parts labelled **A**, **B** and **C**. [3]

(b) Describe how the simple generator works. [6]

(c) Explain how the current generated can be increased. [3]
[Total: 12]

9 **Fig. 5** shows a supported beam.

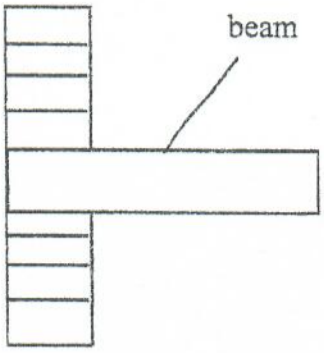


Fig. 5

(a) **(i)** State the type of forces that act at the **top** and at the **bottom** of the beam when it is loaded. [2]

(ii) Give **three** examples of structures made up of this kind of a beam. [3]

(b) A truss is used to perform the function of a beam.

(i) State the main difference between a truss and a beam. [1]

(ii) Why are trusses used in large structures instead of simple beams? [5]

(c) Give **one** reason for using triangles in a truss. [1]

[Total:12]

10 **(a)** **(i)** State and explain **two** ways in which a human being can be infected by a **named** water borne disease. [5]

(ii) Explain how the infection can be prevented. [5]

(b) Explain why prolonged diarrhoea should be prevented. [2]

[Total: 12]

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ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

POSSIBLE ANSWERS

JUNE 2010

INTEGRATED SCIENCE 5006/2

1 (a) (i) Nose/nasal passage;

(ii) 1. Filter the air; [1]

2. warm the air;

3. provide moisture to the air; [3]
Mucus/antiseptic;

(b) (i) alveoli/lungs [1]

(ii) 1. Oxygen content reduced;

2. carbon dioxide content increased;

3. water vapour increased. [3]

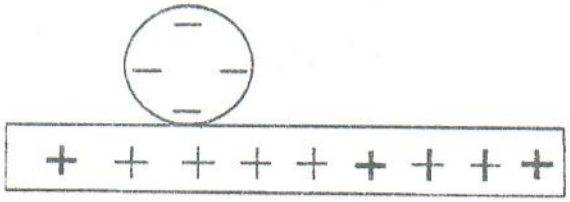
Total [8]

2 (a) (i) forward;
and backward reaction; [2]

(ii) 1. Manufacture of ammonia/Haber process;
2. vanadium pentoxide/VanandiumV oxide;
3. oxidation of ammonia/manufacture of nitric acid; [3]

(b) small particles in powdered zinc;
large surface area;
increasing contact of reactants;
this increases rate of reaction; [3]
(Accept converse) Total [8]

3 (a) (i)



Negative charges on balloon; positive charges on sweater; [2]

(ii) water conducts charges away;
no water molecules collect on surfaces (of materials)
this helps in the build up of electrical charges;
(Accept converse) [3]

(b) staying away from conductors/stoves/metal pipes/sinks/phones;
not using plug-in electrical appliances;
lightning conductor; [3]

Total [8]

4 **(a)** 1. Work done by effort

= force x distance / 15 N x 1,0 m;

= 15 joules (the unit to be correct); [2]

2. Efficiency = $\frac{\text{work done on load}}{\text{work done by effort}} \times 100\%$/

$\frac{10}{15} \times 100\%$;

= 66,7% [2]

(b) **(i)** friction;
weight (of moving parts) of machine; [2]

(ii) oiling;
use of light materials; [2]

Total [8]

5 **(a)** **(i)** fertilisation; [1]

(ii) fusion of male and female gametes to form zygote; [1]

(b) Barrier method: (male/female) condom/ diaphragm/spermicides;
Explanation: traps/blocks movement of sperms/male gametes/kill sperms; preventing fertilisation; [3]

Natural method: suckling breast feeding/rhythm method; suppresses ovulation/avoiding sexual intercourse during the fertile phase (of the woman`s cycle); prevents fertilisation; [3]

Total [8]

Section B

6 (a) (i) Loss of water;
through leaves;
by evaporation; [2]

(ii) helps upward movement of water;
uptake of minerals; cooling effect; [3]

(b) moving air; increases transpiration;
low humidity; increases transpiration;
sunny day means high temperature high/light intensity;
which increase transpiration; transpiration faster than
water uptake [7]

Total [12]

7 (a) (i) hydrogen;
nitrogen; [2]

(ii) nitrogen (obtained) from air;
hydrogen (obtained) from water;
reacted; Ratio 1:3;
iron/catalysts; under conditions of
200 – 300 atmospheres;
temperature of 450 – 500°C;
(Any six points): [6]

(b) ZESA provides electricity;
For electrolysis of water (from Sebakwe Dam);
To produce hydrogen;
For Haber process; [4]

Total [12]

8 (a) A: slip ring(s);
B: (carbon) brush(es);
C: coil; [3]

(b) coil rotates;
in the magnetic field;
cut magnetic lines of force; at right angle;
current is induced in the coil;
induced current reverses direction;
an alternating current is produced; Any 6 points [6]

(c) use a coil with many/more turns;
to increase rate of cutting lines of force;
use stronger magnet;
to increase magnetic field; Any 3 correct points [3]

Total [12]

9 **(a)** **(i)** TOP : tension;
BOTTOM: compression; [2]

(ii) diving board;
balcony;
bridge;
shelves; [3]

(b) **(i)** truss is composed of many members; [1]

(ii) less materials used/economy;
high strength to mass ratio;
strong;
transmit forces/distribute load;
stability; [5]

(c) distributes load; [1]

Total [12]

10 **(a)** **(i)** Cholera/dysentery/typhoid; [1]
shaking hands with infected person;
drinking contaminated water;
by human or animal faeces;

which contains pathogens;

eating contaminated food; [4]

(ii) hand washing after defecation;

drinking treated or boiled water;

treating or boil water kills pathogens (in water);
covering food to avoid contamination;
eating food while it is still hot; [5]

(b) to avoid excessive loss of fluids;

for osmotic balance of cells; [2]

Total [12]

Candidate Name	Centre Number	Candidate Number

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

INTEGRATED SCIENCE 5006/3

PAPER 3

JUNE 2010 SESSION 1 hour

Candidates answer on the question paper

Additional materials:

- Soft pencil (type B or HB is recommended)
- Soft clean eraser
- Ruler (cm/mm)
- Mathematical tables/calculator

Time 1 hour

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page.
Answer **all** questions.
Write your answers in the spaces provided on the question paper.

INFORMATION FOR CANDIDATES

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

FOR EXAMINER'S USE	
1	
2	
3	
4	
TOTAL	

This question paper consists of 10 printed pages and 2 blank pages.

[Turn over

For Examin Use

1 (a) **Fig. 1** shows apparatus set up to investigate the products of fermentation. However, **Fig 1** has one source of error.

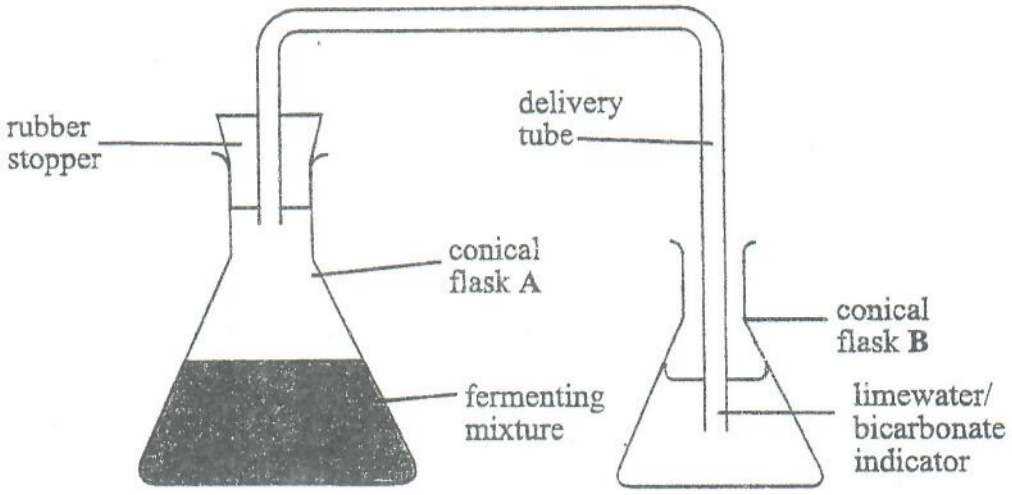


Fig. 1

(i) Correct the error on **Fig 1.** [1]

(ii) Give a reason for the correction you have made.

_____

_____

_____

_____ [2]

(iii) Glucose is one of the materials used to make the fermenting mixture. Name the other raw material.

_____ [1]

For Examiner's Use

(b) State what would be observed in

(i) conical flask **A** during fermentation

_____

_____ [1]

(ii) conical flask **B**, thirty minutes after the start of fermentation.

_____

_____ [1]

(c) (i) Identify the fuel produced in **Fig. 1**.

_____ [1]

(ii) Describe how you would purify the fuel produced in **this** investigation.

_____

_____

_____

_____

_____

_____ [3]

[Total :10]

2 (a) **Fig. 2** shows a circuit diagram of apparatus to be used to investigate the effect of varying the current on the voltage across a fixed resistor.

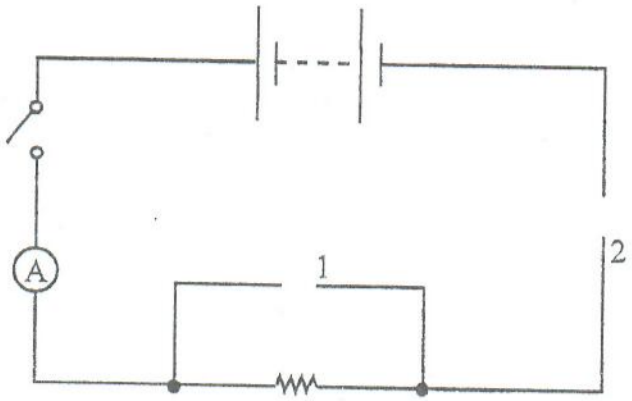


Fig. 2

(i) Correctly draw in the rheostat (variable resistor) and voltmeter in gaps 1 and 2 on **Fig.2** to complete the circuit. [2]

(ii) Describe how you would use the components of **Fig. 2** in this investigation.

_____

_____

_____

_____

_____

_____ [3]

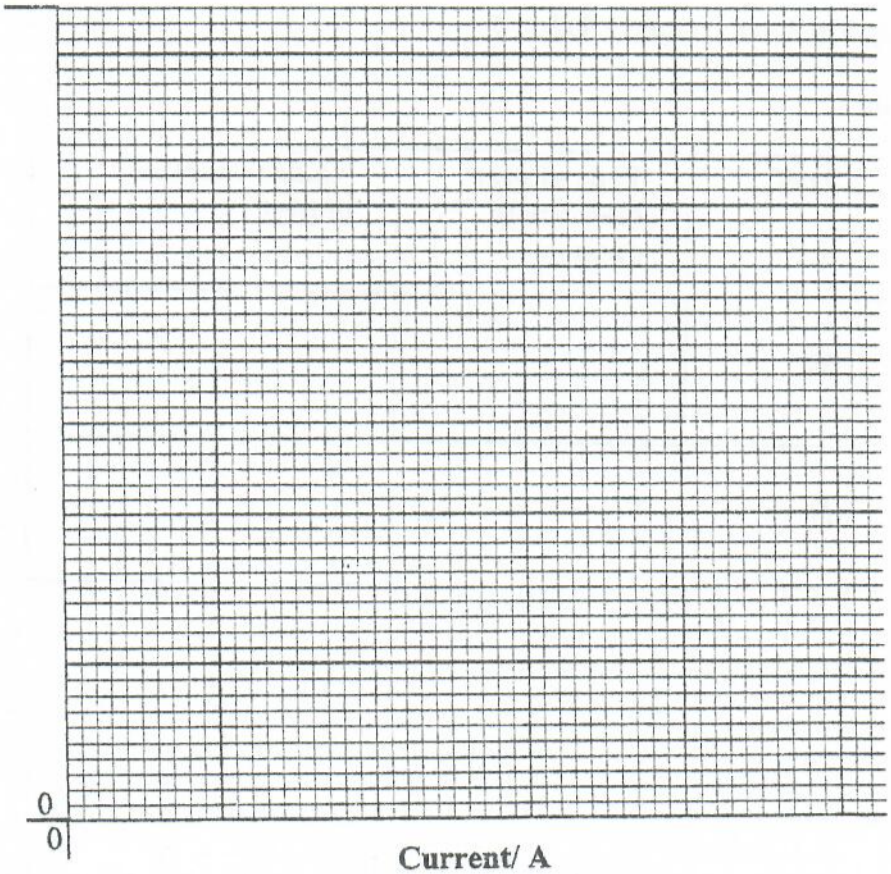
For Examiner's Use

(b) **Table 1** shows a set of results obtained in a similar investigation using another resistor .

Table 1

Current /A	0,2	0,3	0,4	0,5	0,7	0,8	1,0
Voltage/V	1,0	1,6	1,8	2,5	3,5	4,0	5,0

(i) Use the results in **Table 1** to plot a graph of the voltage against current. [3]



(ii) Show and use the gradient/slope of your graph/curve to find the resistance.

resistance = _____ [2]

[Total : 10]

For Examine Use

3 Fig. 3 shows two plant leaves *M* and *N* affected by pests.

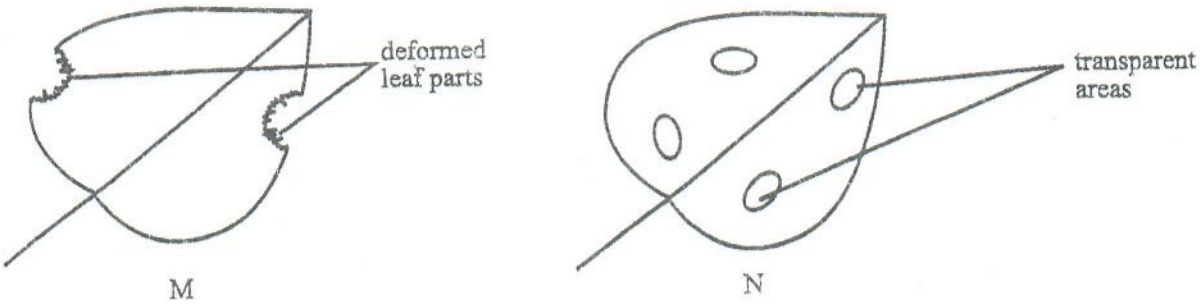


Fig. 3

(a) Study **Fig.3** and complete **Table 2**.

Table 2

	Leaf	Type of pest that caused damage	Named example of pest
(i)	M		
(ii)	N		

[4]

(b) **Table 3** shows drawings of animal parasites. Complete the table.

For Examiner's Use

Table 3

Animal parasite	Name of parasite	Effect of parasite	Method of control
			
			

[6]

[Total : 10]

[Turn over

For Examiner Use

4 (a) **Fig. 4.1** shows an experiment set up to investigate one aspect of liquid pressure.

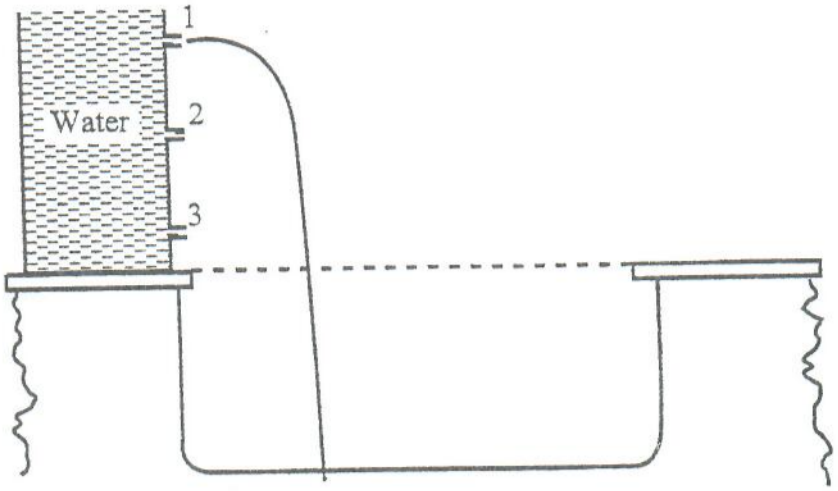


Fig. 4.1

(i) Suggest how a continuous supply of water was provided in this experiment.

_____

_____

_____ [1]

(ii) On **Fig. 4.1** show the water movement from holes **2** and **3**. [2]

(iii) Draw a conclusion from this experiment.

_____

_____

_____ [1]

(b) In another experiment a pupil set up apparatus as shown in **Fig. 4.2.**

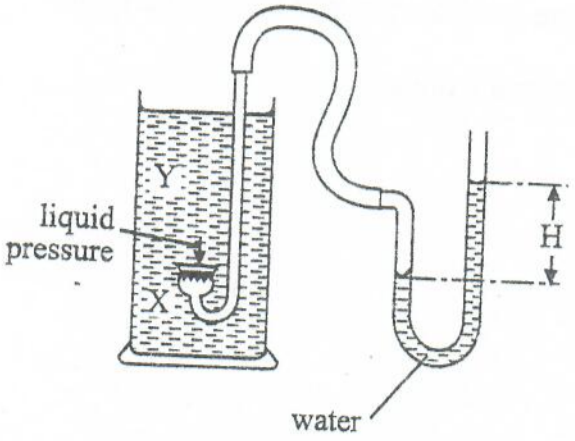


Fig. 4.2

(i) State what would happen to the value of **H** if the funnel were moved from position **X** to **Y**.

_____

_____ [1]

(ii) Explain the observations made in **(b) (i)**.

_____

_____

_____ [1]

(iii) Suggest what would be observed if the funnel were moved sideways but at the same level as **X**. Explain the observation.

_____

_____

_____

_____ [2]

(iv) Given that the height of water (**H**) was 0.5 m, density of water (ρ) = 1 000 kgm^{-3} and acceleration due to gravity (g) = 10 ms^{-2}, calculate the water pressure using the formula:

pressure = $h \times \rho \times g$

answer = _____ [2]

[Total: 10]

For Examiner Use

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

POSSIBLE ANSWERS

JUNE 2010

INTEGRATED SCIENCE **5006/3**

1 (a) (i) Addition of oil layer on mixture; [1]

(ii) Prevent entry of air/oxygen; as fermentation occurs better in the absence of oxygen/ anaerobic conditions; [2]

(iii) Yeast; [1]

(b) (i) **A** bubbling/foam/froth; [1]

(ii) **B** Limewater – cloudy/milky and bubbles;
or Bicarbonate indicator solution – yellow and bubbles; [1]

(c) (i) Ethanol; [1]

(ii) Decant/filter the (fermenting) mixture;
Fractional distil decanted liquid/filtrate;
Repeat fractional distillation of distillate;
Collecting any distillate between 78-80°C in final distillation; [3]

Total [10]

2 (a) (i) voltmeter symbol on 1; variable resistor on 2;

; ; [2]

(ii) Close switch/switch on current;
Take ammeter and corresponding voltmeter readings;
Vary current by adjusting rheostat/variable resistor;
To get several ammeter and corresponding voltmeter readings;
repeat experiment; [2]

(b) (i) both axes correctly labelled;
continuous sale covering 75% graph space;
all points correctly labelled;
all points joined, starting from origin; [3]

(ii) Gradient of graph = $\frac{V}{I}$;

= $\frac{4}{0.8}$;

Resistance = 5 ohms/Ω; [2]

Total [10]

3 (a) Table 1

	Leaf	Type of pest that caused damage	Named example of pest
(i)	M	tissue eating;	locust/caterpillar;
(ii)	N	sap sucking;	aphids/red spider mite;

[4]

(b) Table 2

		Name of parasite	Effect of parasite	Method of control
(i)	M	Tick;	Reduce productivity; red water;	Dipping; spraying dip;
(ii)	N	Fluke;	Reduce productivity/ cause disease (liver disease)	Dosing;

[6]
Total [10]

4 (a) (i) keeping water from the tap running into the apparatus; [1]

(ii) stream 3 furthest; followed by stream 2; [2]

(iii) pressure increases with depth/p ∝ d/as depth increases, pressure increases; [1]

(b) (i) decreases; [1]

(ii) pressure decreases as the funnel moves up/ less water pressing on funnel at Y; [1]

(iii) no change in level h; pressure at the same depth is equal; [2]

(iv) hpg = 0,5 x 1000 x 10/;
= 5 x 1000;
= 5 000 Pa/
5kPa/5Nm^2; [2]

Total:[10]

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

INTEGRATED SCIENCE

PAPER 1 Multiple Choice

5006/1

NOVEMBER 2010 SESSION

1 hour

Additional materials:
- Multiple Choice answer sheet
- Soft clean eraser
- Soft pencil (type B or HB is recommended)

TIME 1 hour

INSTRUCTIONS TO CANDIDATES

Do not open this booklet until you are told to do so.
Write your name, Centre number and candidate number on the answer sheet in the spaces provided unless this has already been done for you.

There are **forty** questions in this paper. Answer **all** questions. For each question there are four possible answers, **A, B, C** and **D**. Choose the **one** you consider correct and record your choice in **soft pencil** on the separate answer sheet.

Read very carefully the instructions on the answer sheet.

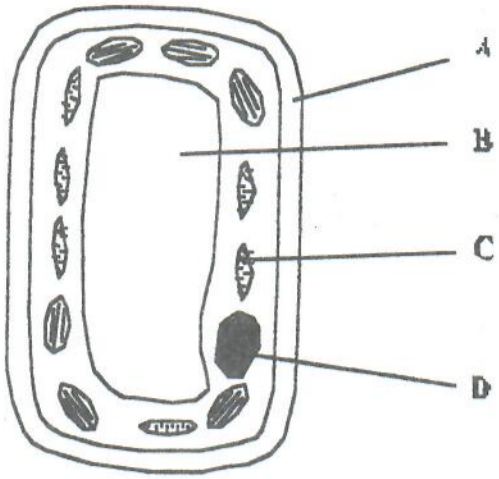
INFORMATION FOR CANDIDATES

Each correct answer will score one mark. A mark will not be deducted for a wrong answer. Any rough working should be done in this booklet.

This question paper consists of 17 printed pages and 3 blank pages.

[Turn over

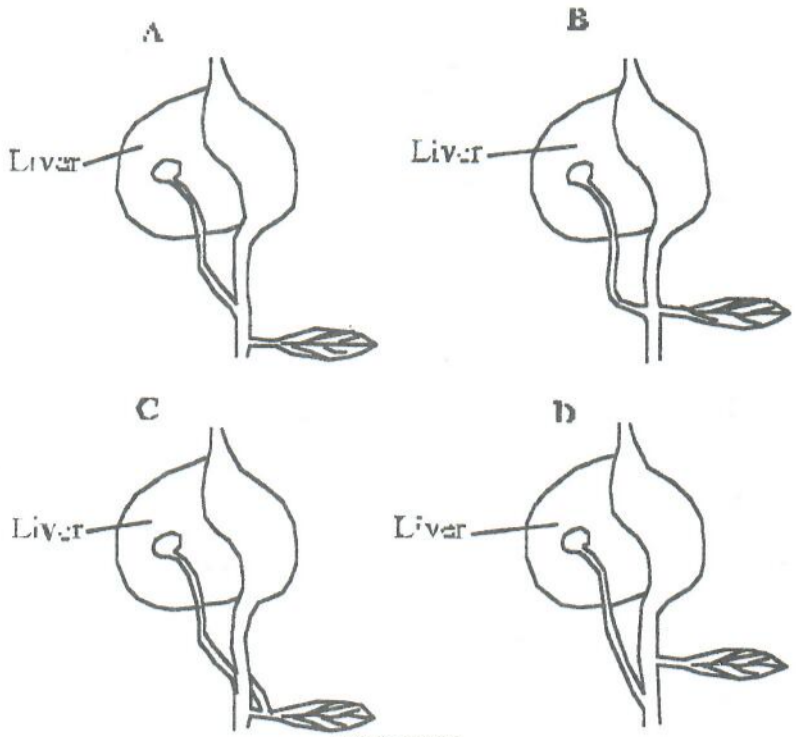
1 The diagram shows a leaf cell. In which part does energy conversion take place?



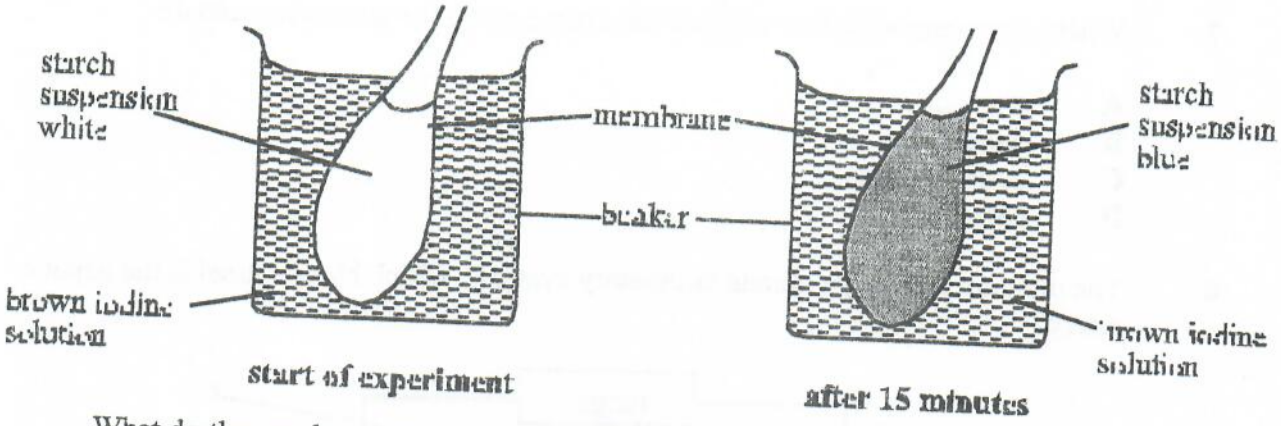
2 If a plant shows yellow and brown leaf margins, which mineral element is lacking?

A nitrogen
B potassium
C calcium
D phosphorus

3 Which diagram shows the correct relationship between the duodenum, bile duct and pancreatic duct in man?



4 The diagram shows an experiment set up, and observed over a period of 15 minutes.



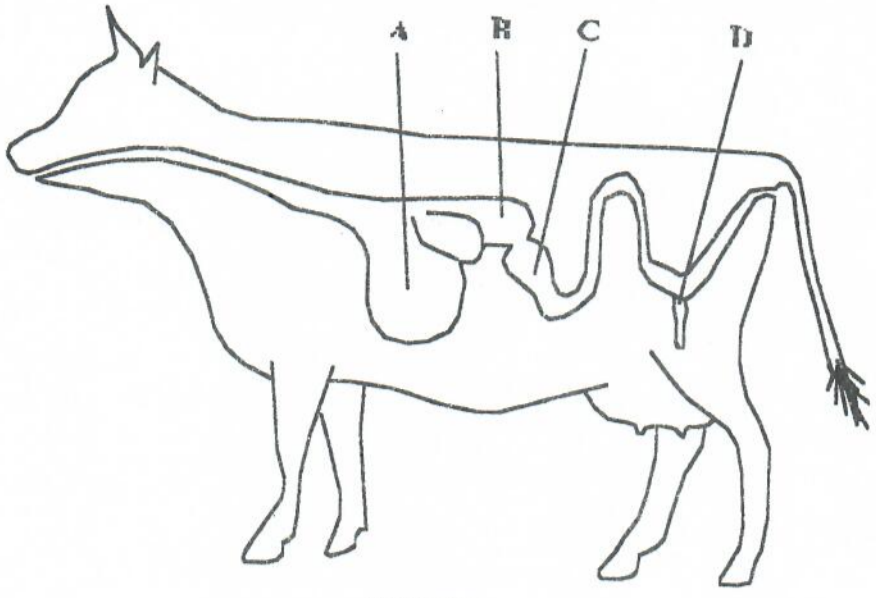
What do the results after 15 minutes tell?

A The membrane is made of living material.
B The membrane allows the diffusion of iodine and not starch
C The membrane allows the diffusion of iodine in one direction only.
D The starch suspension attracts the iodine across the membrane.

5 By what process are mineral ions absorbed in roots and the small intestine?

A diffusion
B active uptake
C osmosis
D capillary action

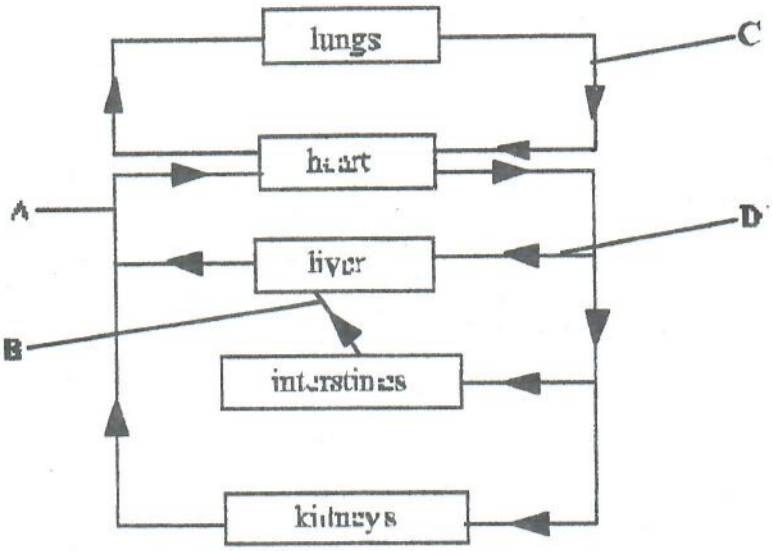
6 The diagram shows the alimentary canal of a cow. In which labelled part does bacteria digest cellulose?



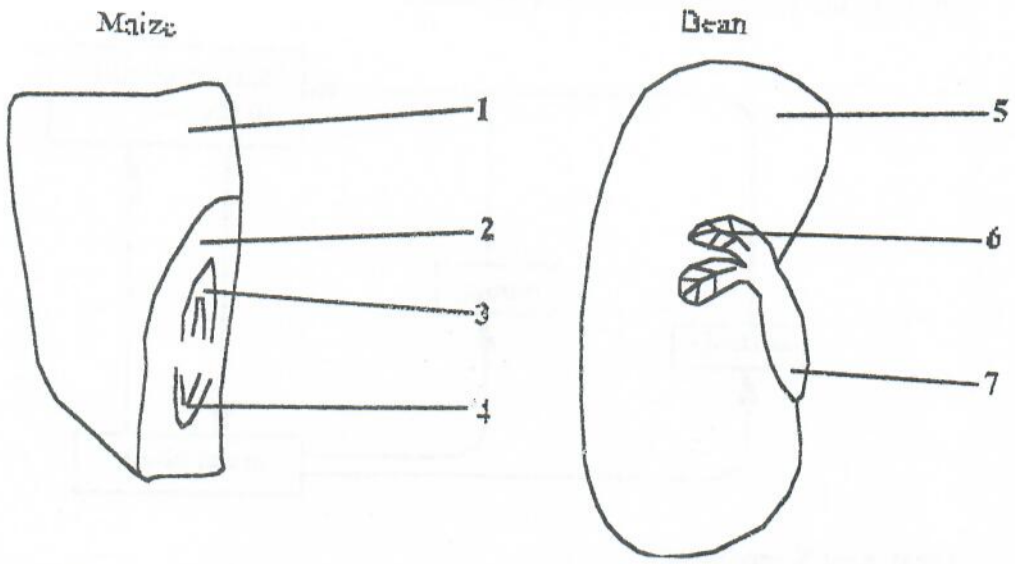
7 Where does emulsification of lipids take place along the alimentary canal?

A stomach
B duodenum
C large intestine
D caecun

8 The diagram shows the human circulatory system. Which blood vessel is the hepatic artery?



9 The diagram shows the internal structures of a bean seed and maize seed.



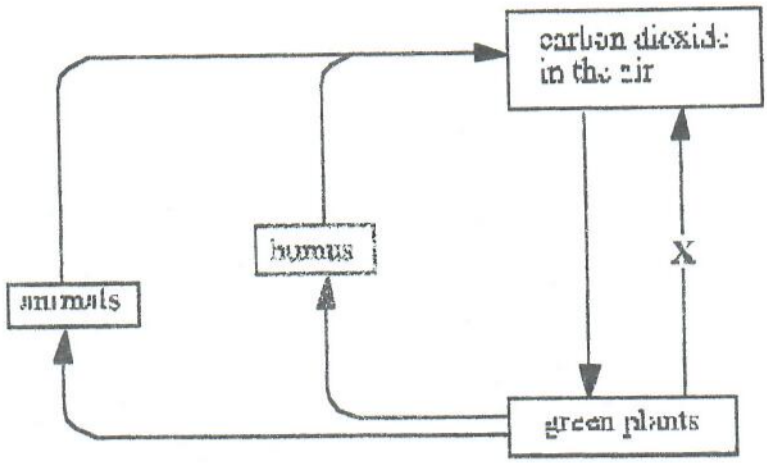
Where are the enzymes that digest food during germination found?

A 1 and 6
B 3 and 6
C 2 and 5
D 4 and 7

10 Which properties are typical of clay soil?

	Drainage	Water retention	Capillary action
A	good	poor	high
B	poor	good	low
C	good	poor	low
D	poor	good	high

11 The diagram shows part of the carbon cycle.



What does **X** represent?

A photosynthesis
B respiration
C lightning
D saprophytic nutrition

12 What is the disadvantage of an artificial ecosystem?

A low species diversity
B high species diversity
C is controlled by man
D soils with high drainage

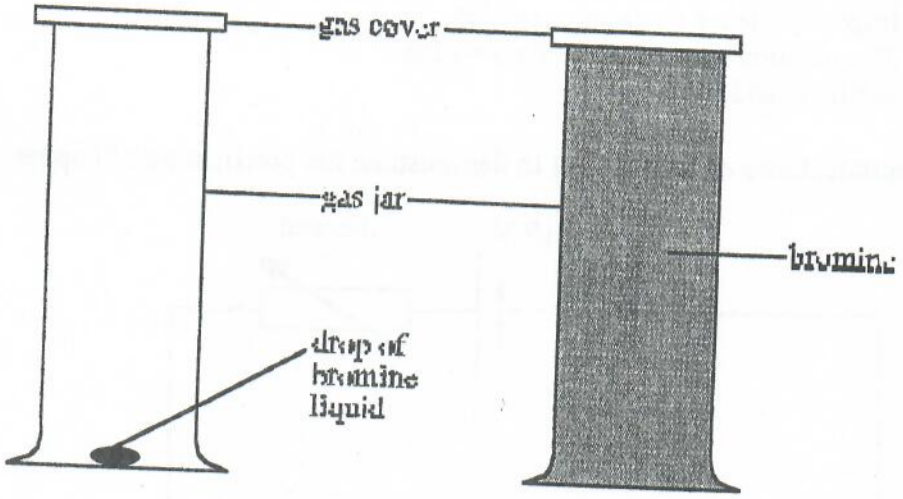
13 Which conservation method is used to maintain game population within the carrying capacity of a habitat?

A poaching
B planting grass
C culling
D building water holes

14 Which elements form basic and acidic oxides?

	basic oxide	**acidic oxide**
A	sulphur	nitrogen
B	magnesium	sulphur
C	zinc	magnesium
D	nitrogen	zinc

15 The experiment shows change of state.



By what process does bromine **fill** the gas jar?

A boiling
B evaporation
C sublimation
D diffusion

16 Which is the correct order of reactivity for metals listed starting with the least reactive?

A iron, aluminium, zinc, magnesium
B magnesium, zinc, aluminium, iron
C iron, zinc, aluminium, magnesium
D zinc, magnesium iron, aluminium

17 The equation shows a redox reaction.

$$\text{Magnesium oxide} + \text{hydrogen} \xrightarrow{heat} \mathbf{X} + \mathbf{Y}$$

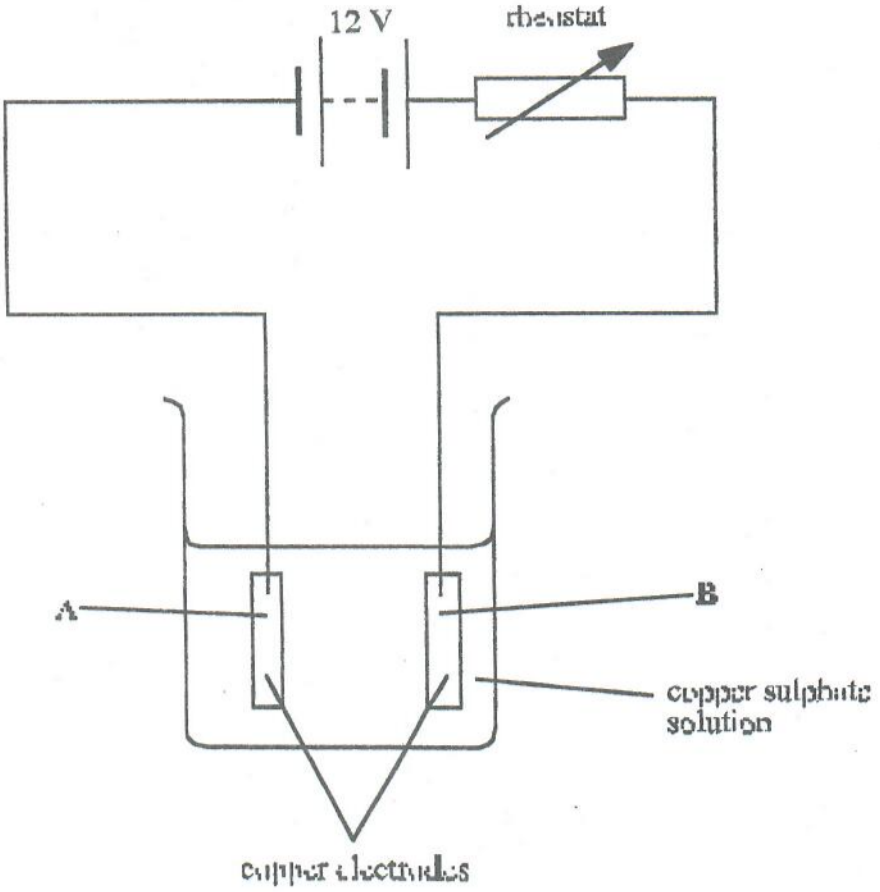
What is **X** and **Y**?

	X	**Y**
A	magnesium hydroxide	water
B	water	magnesium
C	magnesium chloride	water
D	magnesium hydride	oxygen

18 Which statement is correct about the *oxygen lance* process?

A The reaction is reversible.
B Impurities leave as gaseous oxides.
C The reaction manufactures its own fuel.
D A flux is added.

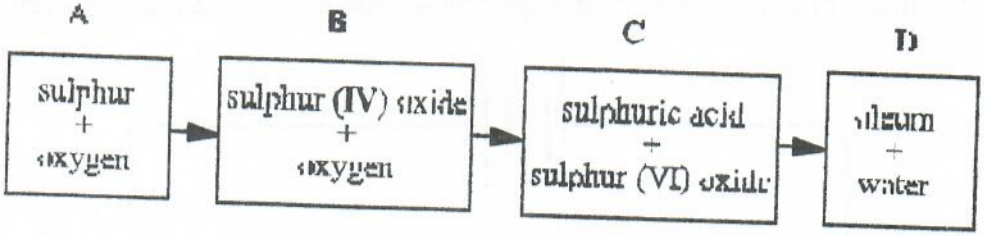
19 The diagram shows an experiment to demonstrate the purification of copper.



Which results are observed?

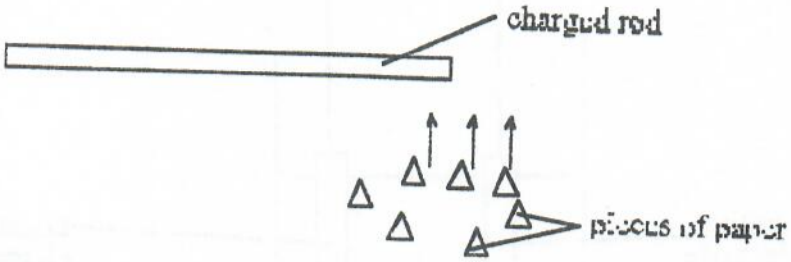
	size of A	size of B	colour of copper sulphate solution
A	decrease	increase	lighter
B	increase	decrease	same
C	increase	decrease	lighter
D	decrease	increase	same

20 The flow chart shows stages in the *Contact process*.



Which stage of the reaction needs a catalyst?

21 The experiment demonstrates electrostatics.



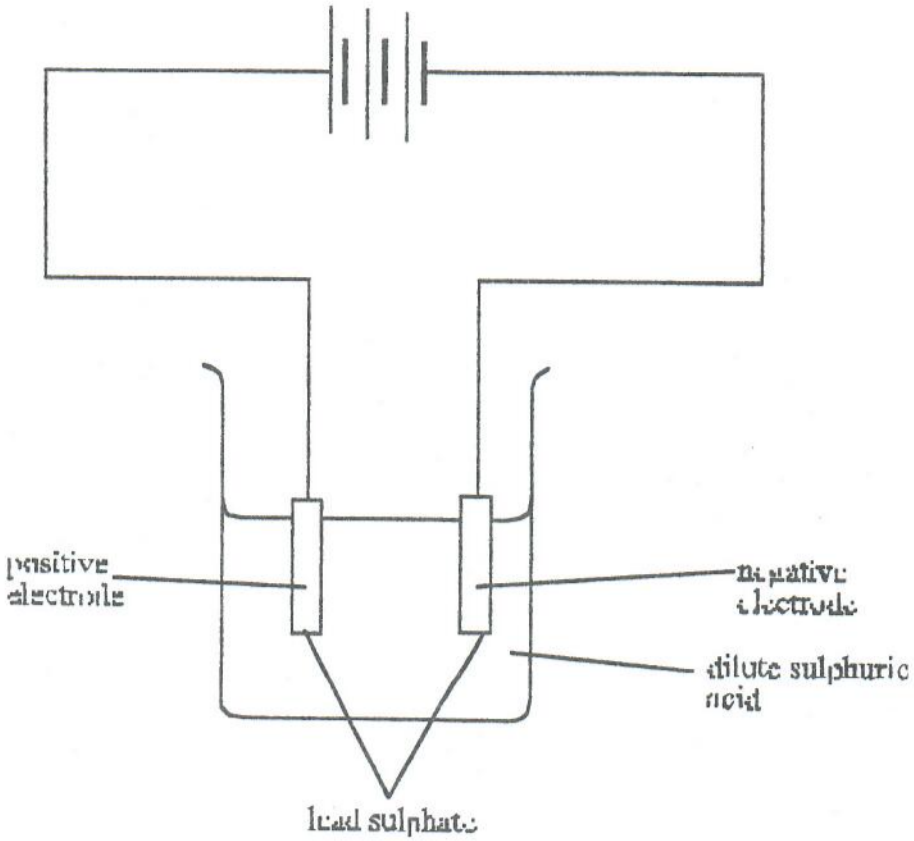
Why is the charged rod able to pick up pieces of paper?

A pieces of paper and rod have same charges
B pieces of paper and rod have different charges
C both pieces of paper and rod are not charged
D the rod is charged but pieces of paper have no charge

22 An electric bulb in a circuit is marked 60 W 240 V. What current flows through the filament?

A 0.25 A
B 40 A
C 960 A
D 14 400 A

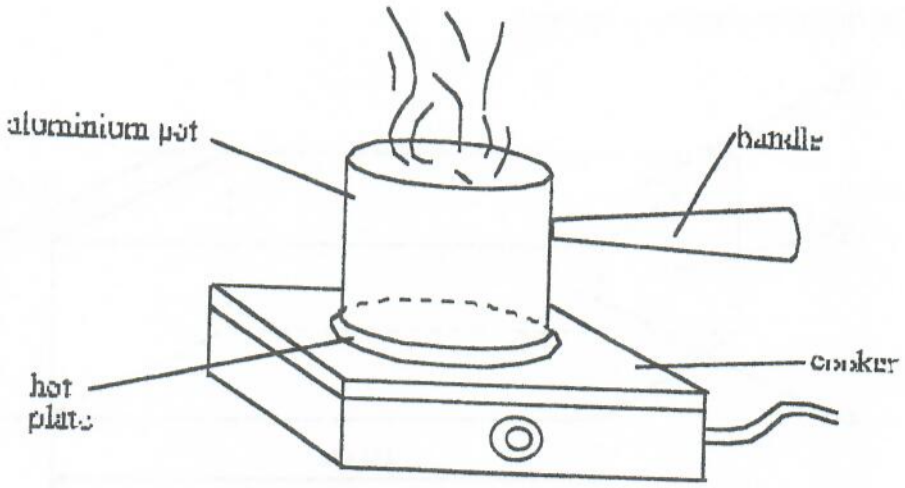
23 The diagram shows a circuit arrangement to charge a simple lead-acid cell.



What is formed at the electrodes during charging?

	positive electrode	**negative electrode**
A	lead (IV) oxide	lead
B	lead	lead (IV) oxide
C	lead sulphate	lead
D	lead	lead sulphate

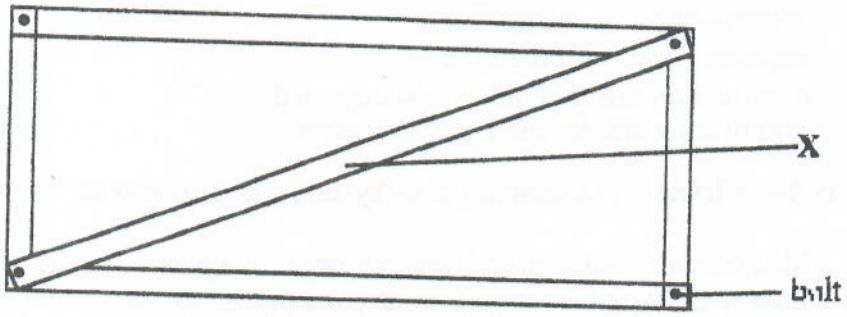
24 The diagram shows water boiling in an aluminium pot.



What would be the advantage of having the handle being made of plastic

A to absorb heat
B to conduct heat away
C to emit heat
D to insulate heat.

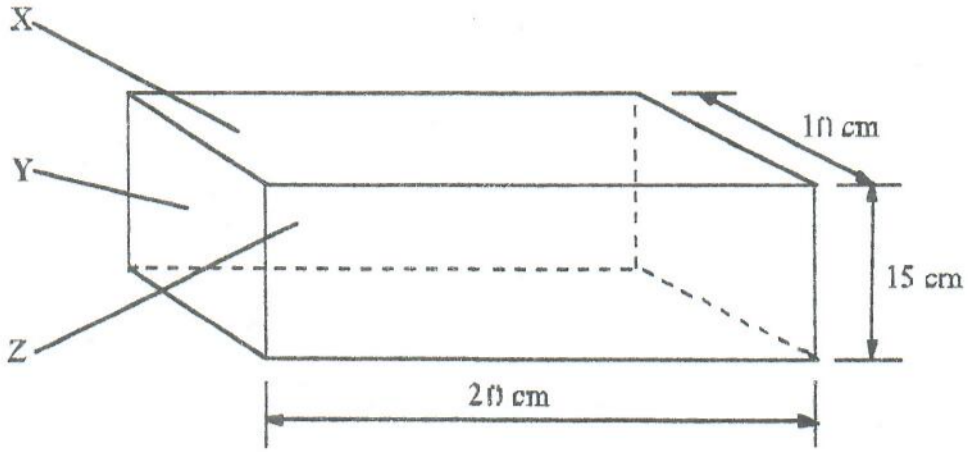
25 The diagram shows trusses on a gate.



The purpose of beam **X** is to withstand

A shear
B tension only
C compression and tension
D compression and shear

26 The diagram shows a 2 kg brick.



Which face exerts the **least** pressure when resting on the ground?

A X
B Y
C Z
D none

27 What is the disadvantage of using a lift pump?

A delivers water on the upstroke
B requires priming all the time
C construction material have to be imported
D cannot lift water for more than 9 meters

28 Why is the efficiency of a simple pulley system less than 100%?

A Mechanical advantage and velocity ratio can never be equal.
B Energy is wasted in moving some parts of the system.
C Work is done more easily by the pulleys.
D Energy cannot be created or destroyed

29 Which formula correctly shows pressure, P in a liquid of mass, m, weight, N, depth, h. and density, ρ.

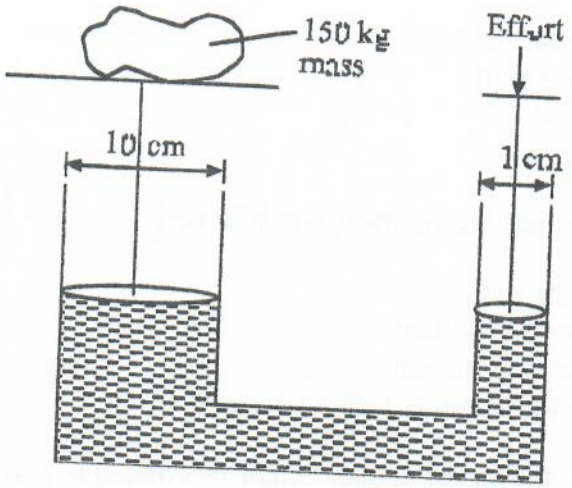
A $P = \frac{hg}{\rho}$

B $P = \frac{h\rho}{g}$

C $P = \rho g h$

D $P = \frac{\rho g}{h}$

30 The diagram shows a hydraulic press.



What is the size of the effort needed to raise the 150 kg mass?

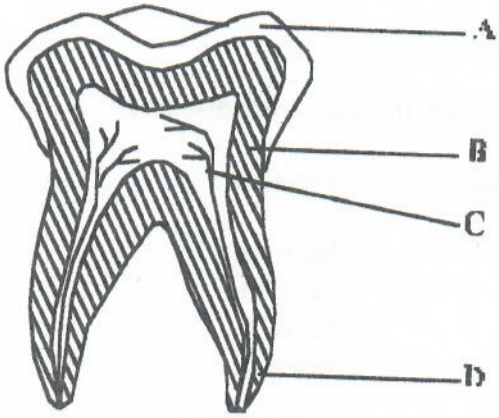
A 1 500 N
B 10 N
C 1.0 N
D 150 N

31 When sodium hydroxide and dilute copper sulphate were added to a liquid food substance a purple colour was obtained. The same liquid food produced a blue black colour on addition of iodine solution.

What nutrients were present?

A reducing sugar and starch
B protein and reducing sugar
C protein and starch
D fats and starch

32 The diagram shows a healthy tooth. Which part detects pain after tooth decay?



[Turn over

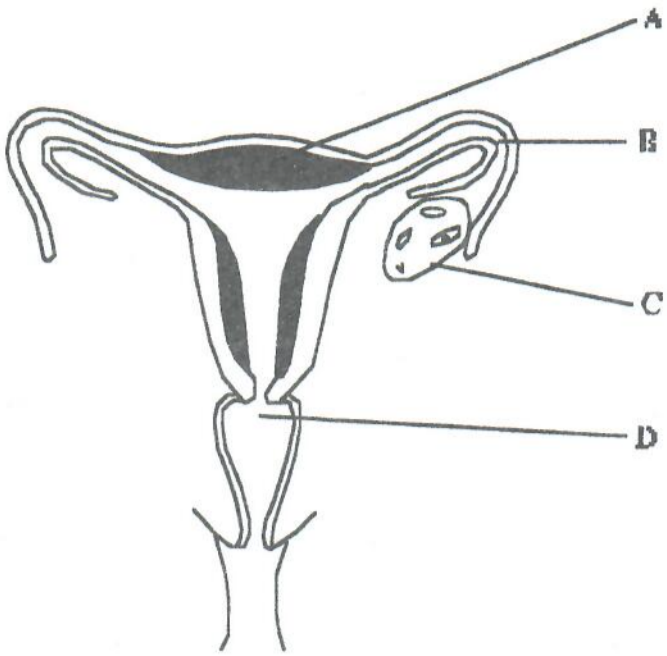
33 Which of the following requires a human host to complete its life cycle?

A anopheles mosquito
B plasmodium
C bacteria
D virus

34 How does the female contraceptive pill work?

A kills the ovum
B blocks the oviduct
C prevents ovulation
D stops the monthly menstrual cycle

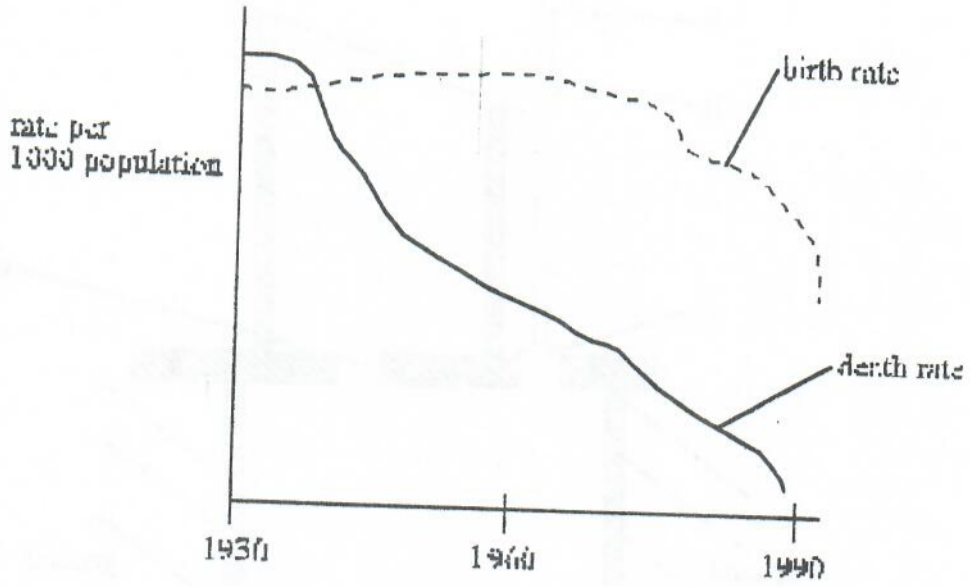
35 The diagram shows the human female reproductive system. Which part develops once every 28 days?



36 Which pathogens cause the following diseases?

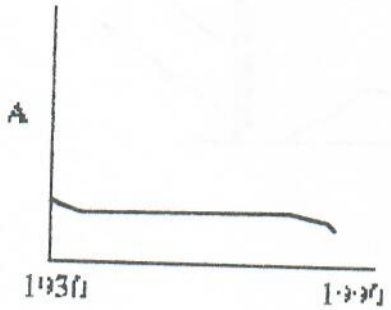
	gonorrhoea	**syphilis**
A	protozoa	bacteria
B	bacteria	protozoa
C	bacteria	virus
D	bacteria	bacteria

37 The graph shows the changes in birth and death rates for a population over a period of 60 years.

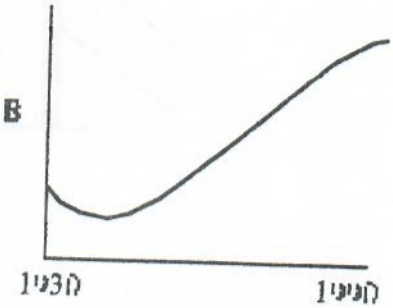


Which graph shows the change in the size of that population?

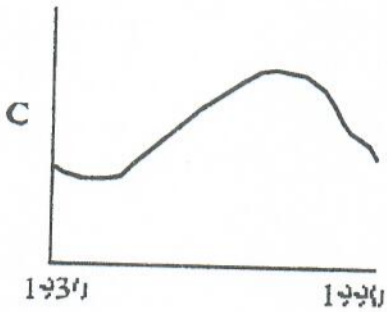
A



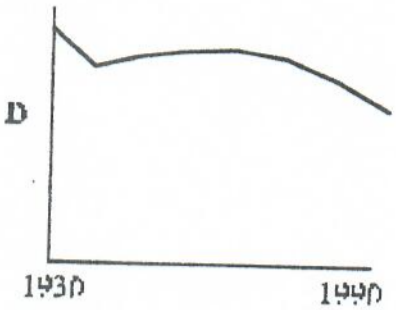
B



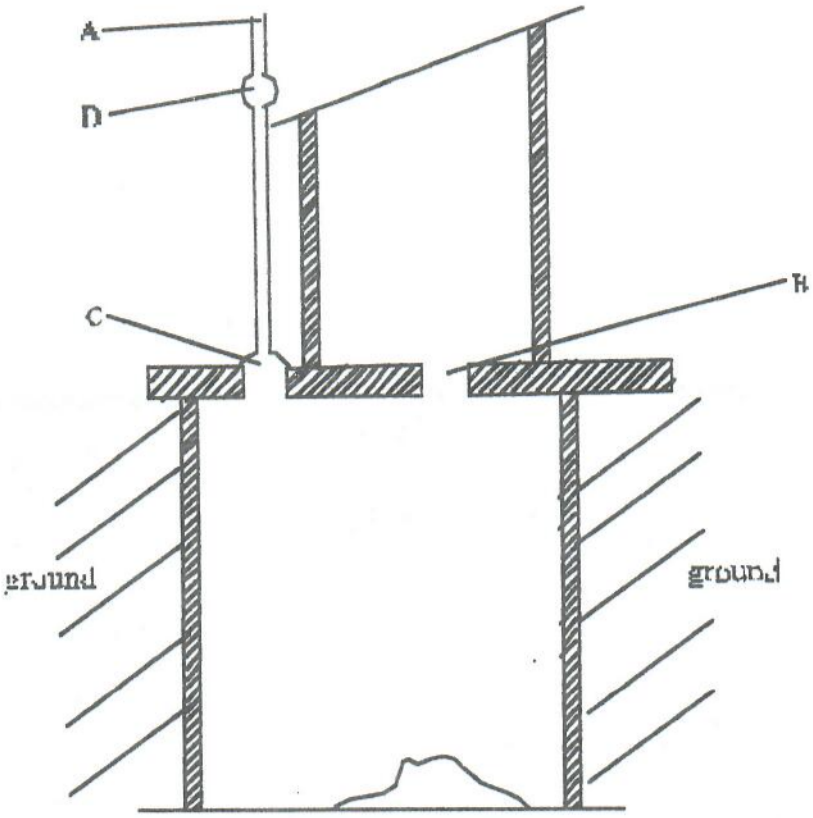
C



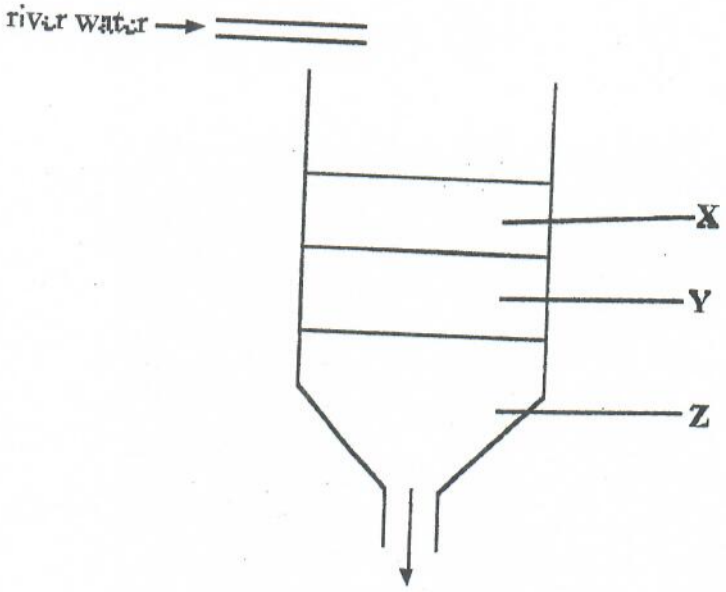
D



38 The diagram shows a ventilated pit toilet. Where would you place a fly screen?



39 The diagram shows a water filter.



Which would be the correct order of the components in the tank?

	X	Y	Z
A	gravel	sand	small rocks
B	sand	gravel	small rocks
C	small rocks	sand	gravel
D	gravel	small rocks	sand

40 Which disease is associated with smoking?

A liver cirrhosis
B head ache
C emphysema
D high blood pressure

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

POSSIBLE ANSWERS

NOVEMBER 2010

INTEGRATED SCIENCE 5006/1

INTEGRATED SCIENCE – 5006/01 – NOVEMBER 2010

SUGGESTED ANSWERS

1.	C	21.	D
2.	B	22.	A
3.	C	23.	A
4.	B	24.	D
5.	B	25.	A
6.	A	26.	C
7.	B	27.	D
8.	D	28.	B
9.	C	29.	C
10.	D	30.	D
11.	B	31.	C
12.	A	32.	C
13.	C	33.	B
14.	B	34.	C
15.	D	35.	A
16.	A	36.	D
17.	B	37.	B
18.	B	38.	A
19.	B	39.	B
20.	B	40.	C

265

Candidate Name | Centre Number | Candidate Number

0015081

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

INTEGRATED SCIENCE 5006/2

PAPER 2

NOVEMBER 2010 SESSION 2 hours

Additional materials:
Answer paper

TIME 2 hours

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page and on all separate answer paper used.

Section A

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

Section B

Answer **all** questions.

Write your answers on the separate answer paper provided.

At the end of the examination, fasten the separate answer paper securely to the question paper.

INFORMATION FOR CANDIDATES

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

You are advised to spend no longer than 45 minutes on Section A and 1 hour 15 minutes on Section B.

FOR EXAMINER'S USE	
Section A	
Section B	
6	
7	
8	
9	
10	
TOTAL	

This question paper consists of 13 printed pages and 3 blank pages.

[Turn over

Section A

*Answer **all** questions in this section in the spaces provided.*

You are advised to spend no longer than 45 minutes on this section.

1 (a) Name **three** parts of the alimentary canal whose function is to digest food.

1. _____

2. _____

3. _____ [3]

(b) **Fig 1.1** shows a representation of the human alimentary canal.

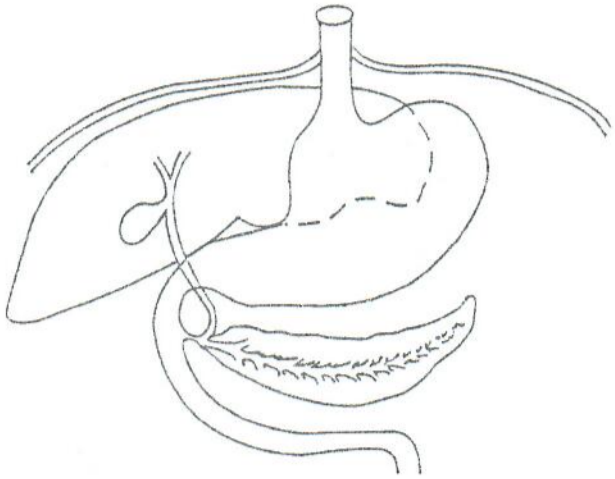


Fig 1.1

(i) Using the letter G indicate on **Fig 1.1** where fat digestion starts. [1]

(ii) **Fig 1.2** shows a fat molecule.

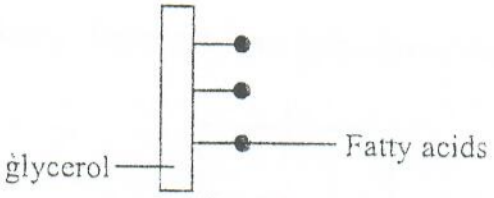
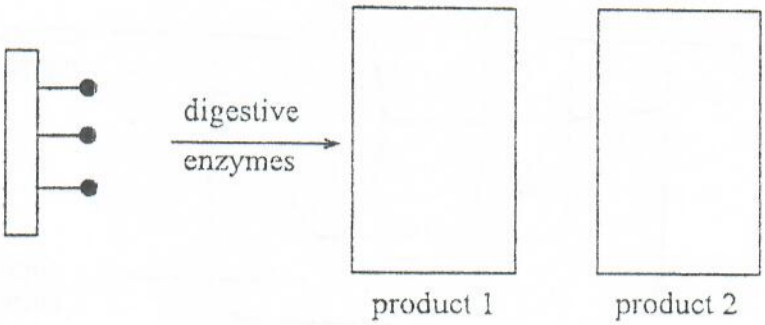


Fig 1.2



Complete the diagram to show **two** products formed from the digestion of the fat molecule.

(c) Explain the importance of digestion.

_____

_____

_____ [2]

[Total : 8]

For Examiner Use

2 (a) Fig. 2 shows a method of purifying impure copper by electrolysis.

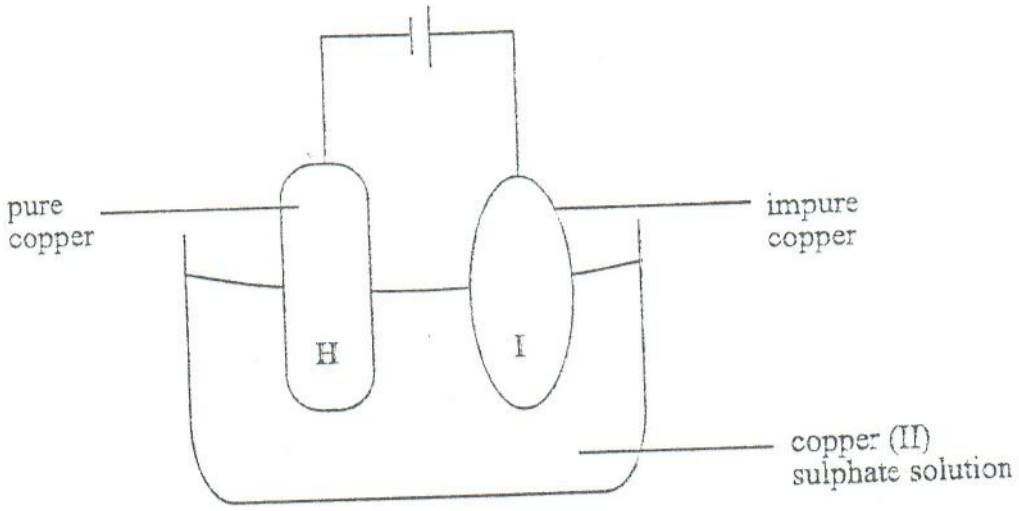


Fig. 2

(i) State the purpose of the copper (II) sulphate solution.

_____ [1]

(ii) Describe briefly what happens to the electrodes during the purification process.

electrode H _____

electrode I _____ [2]

(b) Explain the use of copper in making electrical cables and hot water pipes.

electrical cables:

_____

_____

hot water pipes:

_____

_____ [4]

(c) Name **one** alloy of copper.

_____ [1]

[Total : 8]

3 (a) Fig. 3 shows a small electric motor used in a battery operated toy car.

For Examiner's Use

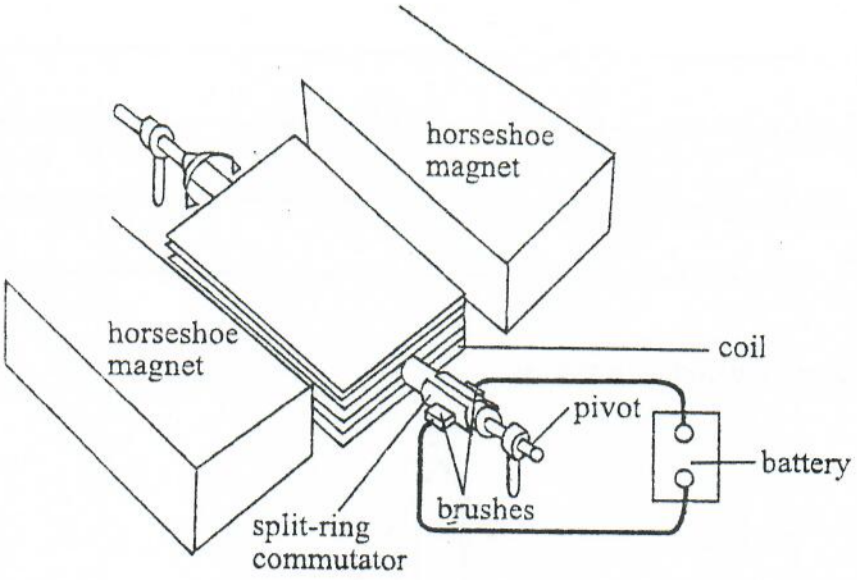


Fig. 3

(i) Describe the observations that would be made when current passes through the coil.

_____

_____

_____ [2]

(ii) State the function of a commutator.

_____ [1]

(iii) Suggest **two** ways that could be used to reverse the toy car.

_____

_____ [2]

(b) Describe and explain what would happen to the toy car if the coil was connected to an alternating current power supply.

_____

_____

_____

_____ [3]

[Total : 8]

4 Fig. 4 shows a wooden roof truss.

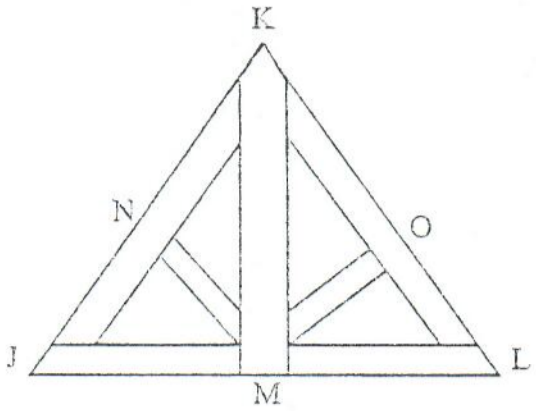


Fig. 4

(a) (i) Identify the forces that act on beams JL, KL, and KM when the truss is loaded.

JL _____

KL _____

KM _____ [3]

(ii) State **two** advantages of trusses over beams.

1 _____

_____

2 _____

_____ [2]

(b) State **two** advantages and **one** disadvantage of using steel for the construction of a truss.

advantages 1 _____

2 _____ [2]

disadvantage _____ [1]

[Total : 8]

For Examiner's Use

5 **Table 1** shows the average daily energy requirements for people.

Table 1

	energy used in a day/kJ	
	males	**females**
8 year old	8 500	8 500
teenager (14 years)	12 500	9 700
adult office worker	11 000	9 800
adult manual worker	15 000	12 000

(a) Deduce from the table **three** factors that determine the amount of energy a person needs a day.

1 _____

2 _____

3 _____ [3]

(b) (i) Describe and explain the effect of taking in more carbohydrates than the body requires.

_____

_____

_____ [3]

(ii) Name **two** other constituents of a balanced diet.

1 _____

2 _____ [2]

[Total : 8]

Section B

*Answer **all** questions on the separate answer paper.*

6 (a) **Fig. 5.1** represents part of the human circulatory system.

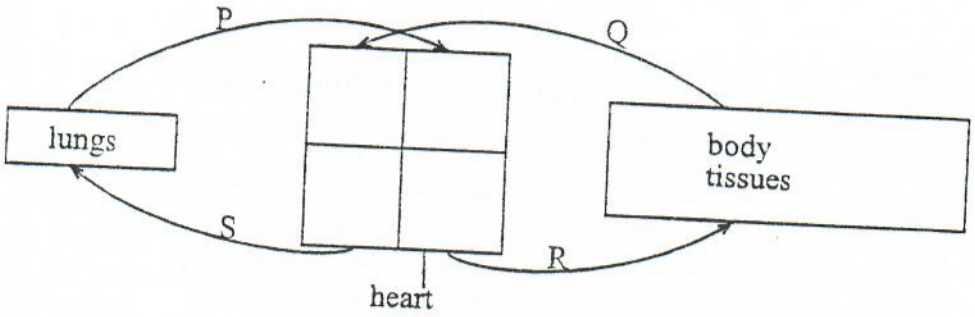


Fig. 5.1

(i) Identify blood vessels P, Q, R and S. [4]

(ii) List **three** differences between blood vessels Q and R. [3]

(b) **Fig. 5.2** shows a sample of goat blood that was left for some time.

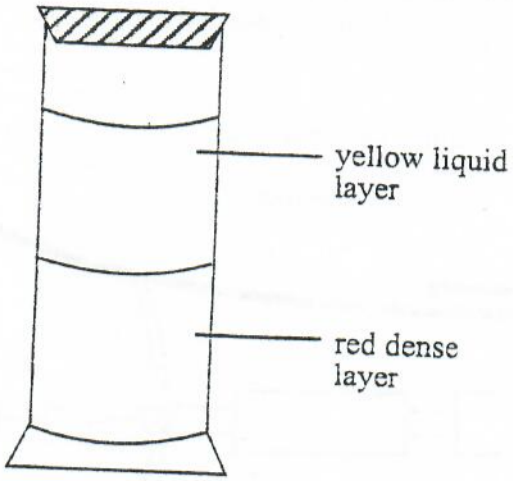


Fig. 5.2

(i) Name the liquid component of the blood and state its function. [2]

(ii) State the blood components in the red dense layer [3]

[Total : 12]

7 Table 2 shows the effect of three substances on litmus paper.

Table 2

	observations	
substance	red litmus paper	blue litmus paper
T	remains red	turns red
U	remains red	remains blue
V	turns blue	remains blue

(a) Explain what these observations indicate about the nature of the three substances. [6]

(b) (i) Write a word equation for the reaction between zinc and dilute hydrochloric acid. [2]

(ii) State **four** ways by which the reaction between zinc and dilute hydrochloric acid can be speeded up. [4]

[Total : 12]

8 (a) Fig. 6 shows a section through a torch.

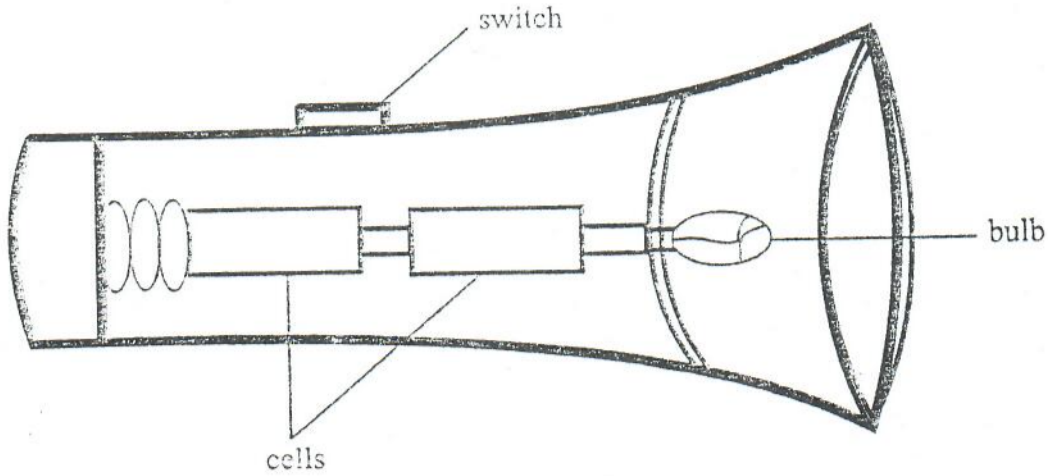


Fig. 6

(i) Draw a circuit diagram to show how the switch, bulb and cells are connected. [4]

(ii) Identify two energy converters in the torch and for each state the energy conversion that occurs. [6]

(b) Calculate the current that passes through a 6V, 3W torch bulb. [2]

9 **Fig. 7.1** shows a model of a pump. [Total : 12]

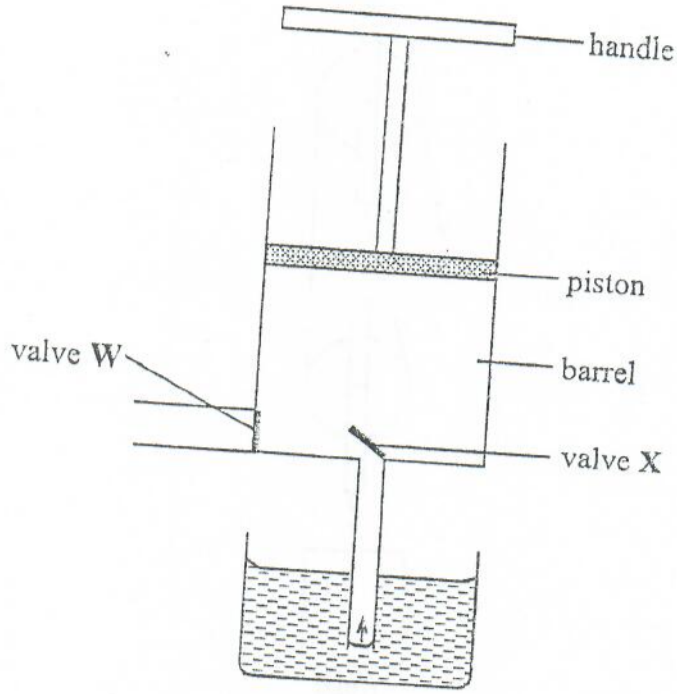


Fig. 7.1

(a) Describe and explain what happens when the handle is pulled up. [6]

(b) **Fig. 7.2** shows different pulley systems, **G**, **H** and **I**.

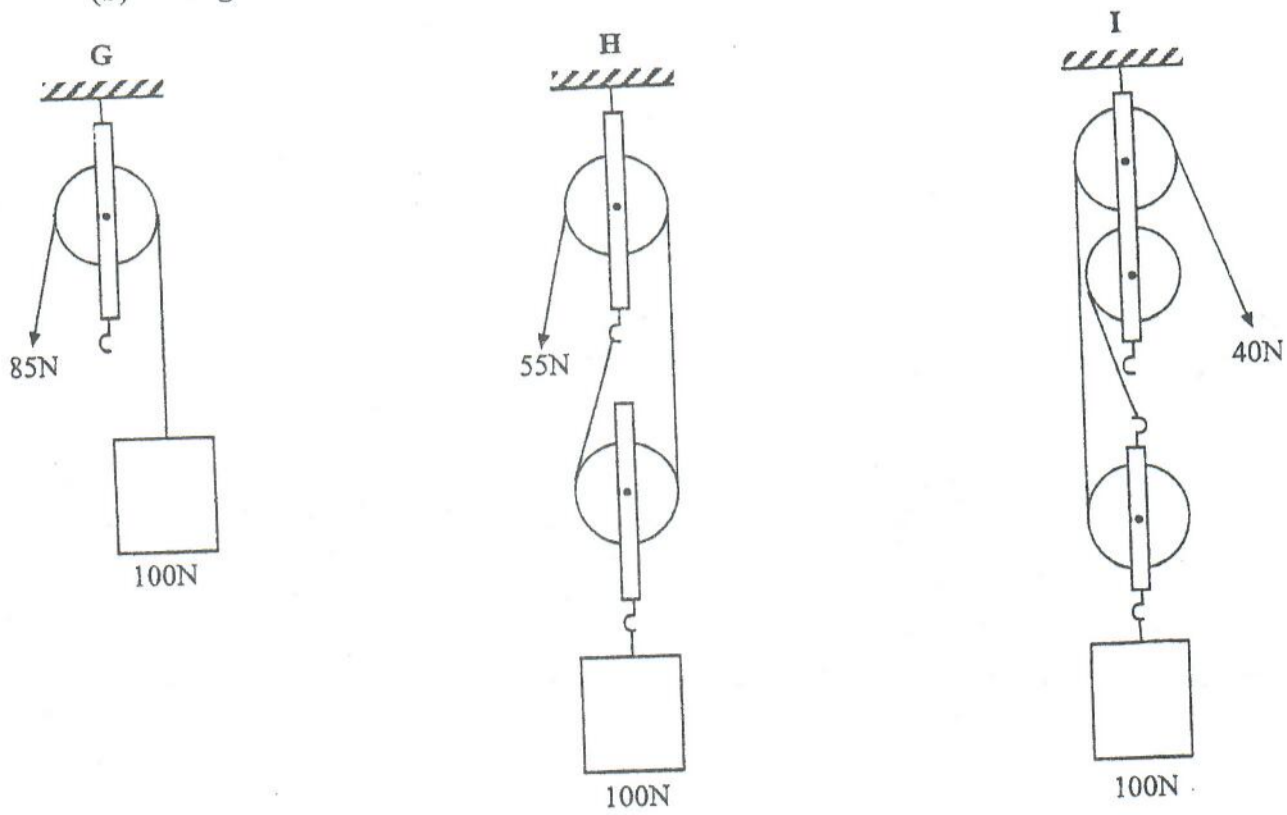


Fig. 7.2

(i) State the velocity ratio of each pulley system. [3]

(ii) Deduce a relationship between velocity ratio and effort. [1]

(iii) Calculate the mechanical advantage of pulley system **I**. [2]

[Total : 12]

10 **Fig. 8** shows a flow chart showing stages in the reproduction of humans.

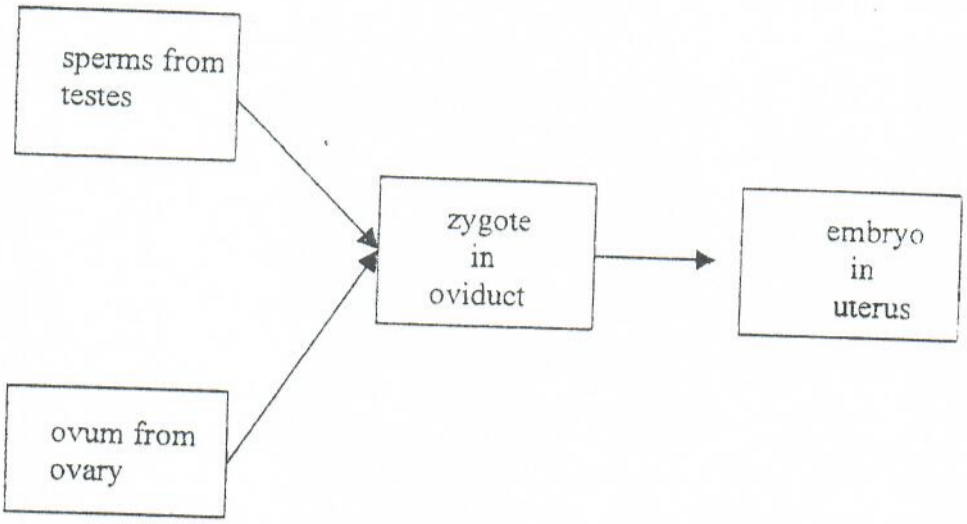


Fig. 8

(a) Draw a labelled diagram of a sperm cell. [3]

(b) State and explain **two** differences between a sperm and an ovum. [4]

(c) Describe the path followed by sperms from the testes to the oviduct. [4]

(d) State when fertilisation would occur if an ovum was released on the 6th of June. [1]

[Total : 12]

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

POSSIBLE ANSWERS

NOVEMBER 2010

INTEGRATED SCIENCE 5006/2

1 (a) mouth;
stomach;
small intestines/ileum; duodenum; [3]

(b) (i) label of duodenum; [1]

(ii) product 1: fatty acids;
product 2: glycerol; Accept any order [2]

(c) produce small molecules;
that are soluble;
can pass through gut wall/absorbed; [2]
Total [8]

2 (a) (i) electrolyte/conducts electricity; [1]

(ii) H : gets bigger;
I ; gets smaller; [2]

(b) electrical cables : ductile;
good conductor of electricity; [2]

hot water pipes; malleable; resist corrosion; [2]

(c) brass/bronze; [1]
Total [8]

3 (a) (i) Coil turns; clockwise; [2]
(ii) reverse current; [1]
(iii) reverse battery connections;
turn magnet; [2]

(b) toy car would not move;
coil would reverse its direction;
each time the current reversed its direction: [3]
Total [8]

4 (a) (i) JL : tension;
KL : compression;
KM : compression; [3]

(ii) economic/less material used;
strong; high strength to mass ratio; [2]

(b) advantages : strong; more durable/ does not burn/decay; [2]
disadvantage : corrodes/heavy/expensive; [1]
Total [8]

5 (a) age;
sex;
activities;

[3]

(b) (i) weight gain;
excess carbohydrates stored as fat;
may lead to obesity/coronary heat disease;

[3]

(ii) fats; proteins; roughage;
minerals salts; vitamins; water; Any two

[2]

Total [8]

Section B

6 (a) (i) P ; pulmonary vein;
Q : vena cava;
R : Aorta;
S : pulmonary artery; [4]

(ii) Q has wider lumen; carries deoxygenated blood: wall thinner/ carries blood at low pressure; has valves; (converse is true) [3]

(b) (i) plasma;
transport dissolved substances; [2]

(ii) red blood cells; white blood cells; platelets; [3]

Total [12]

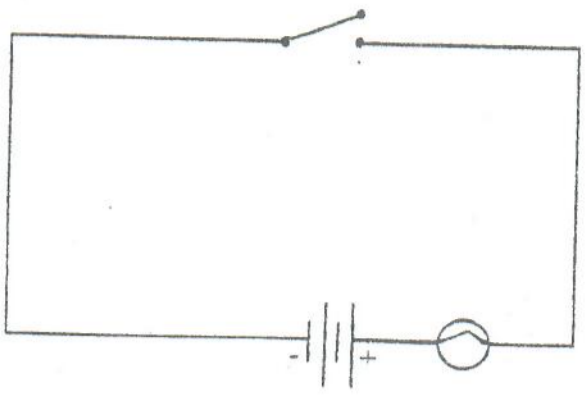
7 (a) T : acid; turns blue litmus red; (blue can be left out); [2]
U : neither an acid; nor base/no effect on litmus; [2]
V : base ; turns red litmus blue; (red can be left out); [2]

(b) (i) zinc + hydrochloric acid ⟶ zinc chloride; + hydrogen; [2]

(ii) increase concentration of acid;
increase temperature;
break zinc into small pieces;
use a catalyst/copper/copper sulphate; [4]

Total [12]

8 (a) (i)



Two cells	1
Switch	1
Bulb	1
Complete circuit	1

[4]

(ii) bulb; electrical; to light; [3]

cell; chemical; to electrical; [3]

(b) $1 = {}^{P}/_{V} / {}^{3w}/_{6v}$;

0,5 A; Unit to be correct for the mark to be awarded. [2]

Total [12]

9 (a) piston moves up;

pressure in barrel decreases/volume increases;

atmospheric pressure (causes);

value x opens;

valve w closes;

barrel fills with water; [6]

(b) (i) G : 1;

H : 2;

I : 3; [3]

(ii) as velocity ratio increases the effort decreases; [1]

(iii) $\text{M.A.} = \frac{L}{E} / \frac{100N}{40N}$;

2.5; [2]

Total [12]

10 (a) nucleus;

cytoplasm;

membrane;

tail; [3]

(b) sperm has a tail; for mobility;

ovum bigger/sperm smaller;

contains food for zygote/no food; [4]

(c) sperm duct; urethra; vagina; uterus; [4]

(d) 6 – 8 June; [1]

Total [12]

Candidate Name

Centre Number | Candidate Number

0015546

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

INTEGRATED SCIENCE

PAPER 3 **5006/3**

NOVEMBER 2010 SESSION 1 hour

Candidates answer on the question paper

Additional materials:

- Soft pencil (type B or HB is recommended)
- Soft clean eraser
- Ruler (cm/mm)
- Mathematical tables/calculator

Time 1 hour

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page.
Answer **all** questions.
Write your answers in the spaces provided on the question paper.

INFORMATION FOR CANDIDATES

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

FOR EXAMINER'S USE	
1	
2	
3	
4	
TOTAL	

This question paper consists of 10 printed pages and 2 blank pages.

[Turn over

1 Fig. 1 shows the results of an experiment to investigate the effect of nitrogen and phosphorus on growth of maize seedlings .

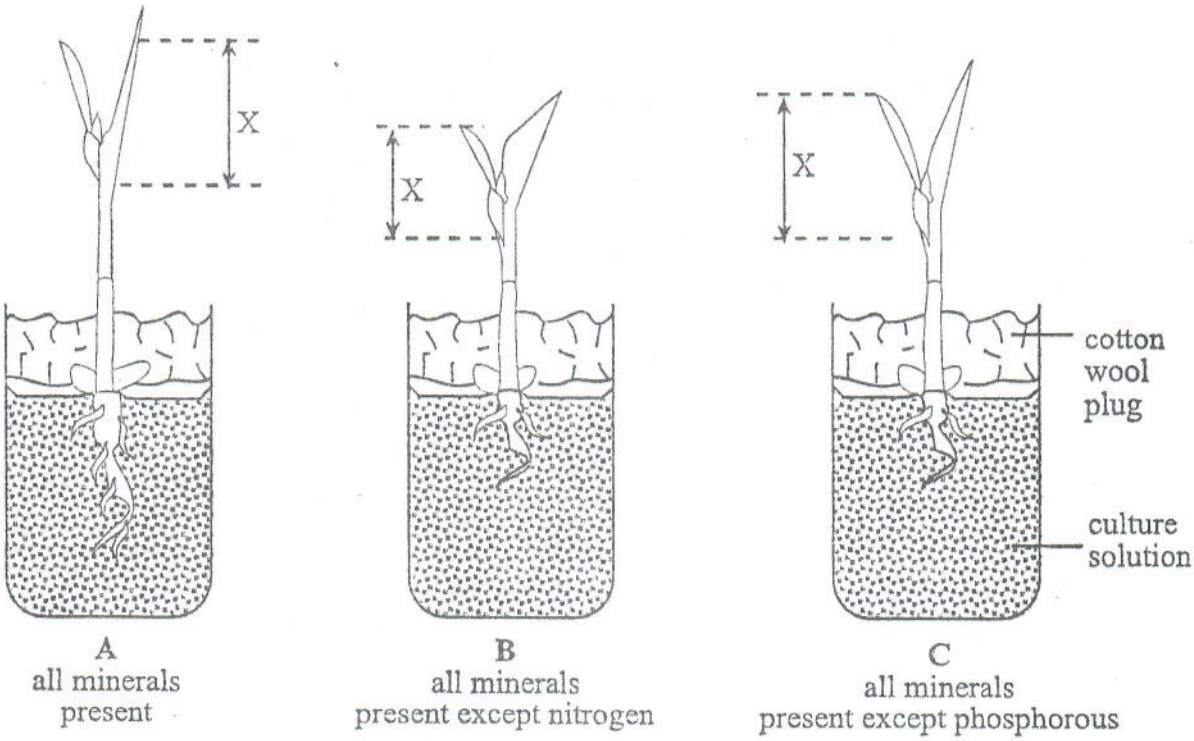


Fig. 1

(a) (i) Using a suitable method measure the length of the first leaf blade X and the main root of each maize plant and complete **Table 1**.

Table 1

	A	B	C
leaf blade length X/cm			
root length/cm			

[3]

(ii) In which solution did the leaf blades grow least?

_____ [1]

(iii) In which solution did the root system grow the most?

_____ [1]

For Examiner's Use

(iv) State the effect of nitrogen and phosphorus on the growth of the maize plants.

nitrogen

_____

_____

phosphorus

_____

_____ [2]

(v) Which solution acted as the control?

_____ [1]

(vi) State, with a reason, **one** precaution which should be taken to ensure that the conclusions drawn are reliable.

precaution

_____

_____

reason

_____

_____ [2]

[Total : 10]

2 (a) **Fig. 2.1** shows a syringe containing some air. The syringe is sealed at one end and placed in a beaker with hot water.

For Examine Use

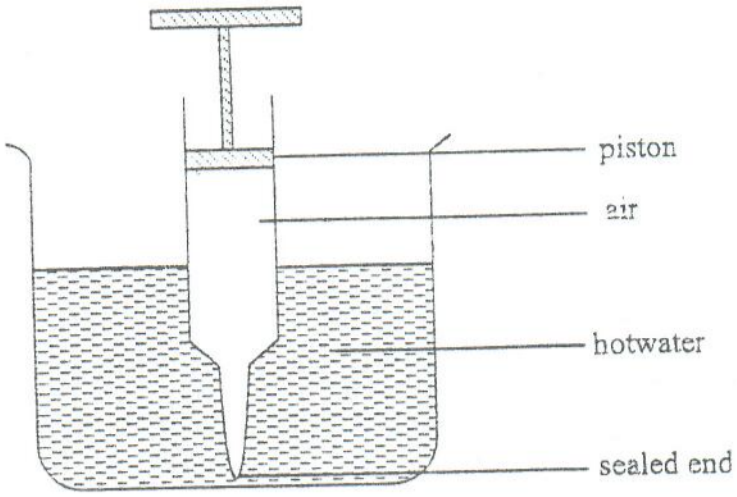


Fig. 2.1

(i) State **one** observation that is made when the syringe is immersed in hot water.

_____

_____ [1]

(ii) Explain this observation.

_____

_____

_____

_____ [3]

(b) Fig. 2.2 shows a circuit in which a resistance coil is immersed in water.

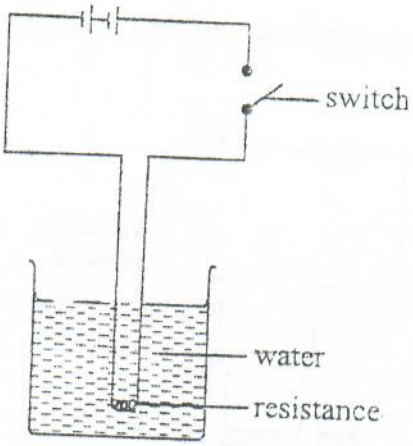


Fig. 2.2

(i) What is the effect of closing the switch?

_____ [1]

(ii) Explain what happens to the temperature of the water when the switch is closed for 10 minutes.

_____

_____

_____ [2]

(iii) What energy change is taking place in the coil?

_____

(iv) On Fig. 2.2 show how a voltmeter would be connected to measure the voltage of the resistance coil. [3]

For Examin Use

3 **Fig. 3** shows apparatus used to study the electrolysis of aqueous copper sulphate using inert electrodes.

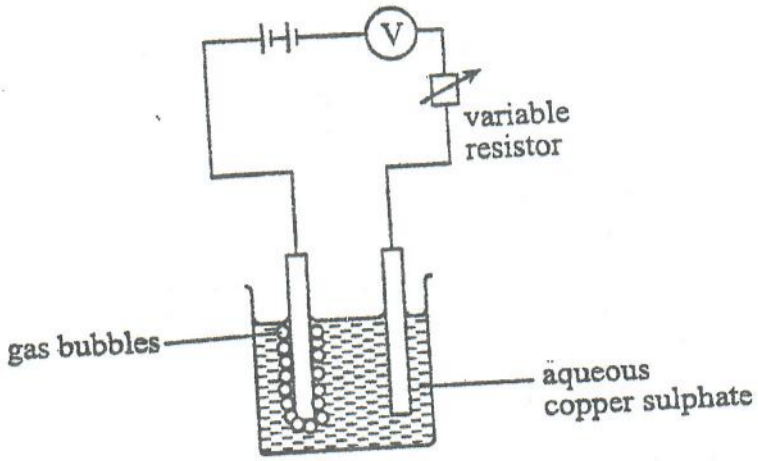


Fig. 3

(a) On **Fig. 3**

(i) label the cathode, [1]

(ii) show by an arrow the conventional flow of current. [1]

(b) (i) Name the substance deposited on the cathode.

substance:

_____ [1]

(ii) Suggest the source of this substance.

source:

_____ [1]

(c) A constant current was passed through the cell for 60 minutes. At 10 minute intervals the cathode was removed, carefully washed, dried and then weighed. The results obtained are shown in **Table 2** below.

For Examiner's Use

Table 2

Time (min)	mass of cathode (g)	total increase in mass (g)
0	10.50	0.00
10	10.95	0.45
20	11.40	
30	11.86	
40	12.30	1.80
50	12.51	2.01
60	12.51	2.01

(i) Calculate the total increase in mass for the missing values and complete **Table 2**.

(ii) After 60 minutes, the current was switched off. Blue litmus paper was placed in the electrolyte and it turned red. Suggest an explanation for this observation.

_____

_____ [1]

(iii) Suggest what changes must be made to the experiment in order to obtain pure copper from an impure sample of copper.

_____

_____

_____

_____

_____ [3]

[Total : 10]

[Turn over

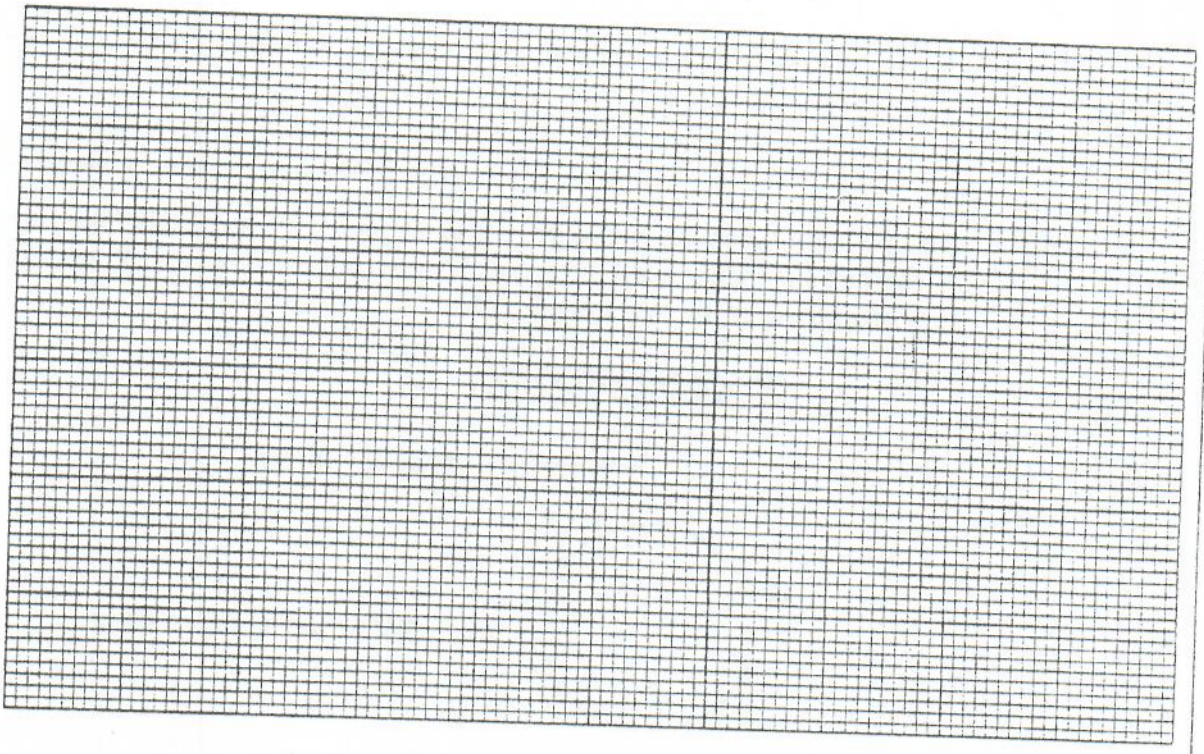
4 A student carried out an experiment to investigate the maximum load a beam supports as the length of the beam is varied. Results from the experiment are given in Table 3.

Table 3

Length of beam (cm)	maximum load (N)
26	4
24	6
20	10
18	13
14	18
10	22
6	28

(a) (i) Use **Table 3** to plot maximum load (on y-axis) against length of beam on the grid below. [3]

For Examiner's Use



(ii) Find the length of beam that carried a maximum load of 24 N.

length of beam _____ cm [1]

(iii) With reference to the graph, what is the relationship between the length of a beam and its strength?

_____

_____ [1]

(iv) How is the problem stated in (a)(iii) above overcome in the construction of simple span bridges over wide rivers?

_____

_____ [1]

(v) State, with a reason which material is suitable for the construction of bridges longer than 30 meters.

type of material,

_____ [1]

reason for choice.

_____ [1]

(c) **Fig. 4** below shows an uncharged perspex sphere, W, suspended by a thread. A charged Perspex sphere, X, and a charged polythene sphere, Y, are each in turn brought near, but not touching W.

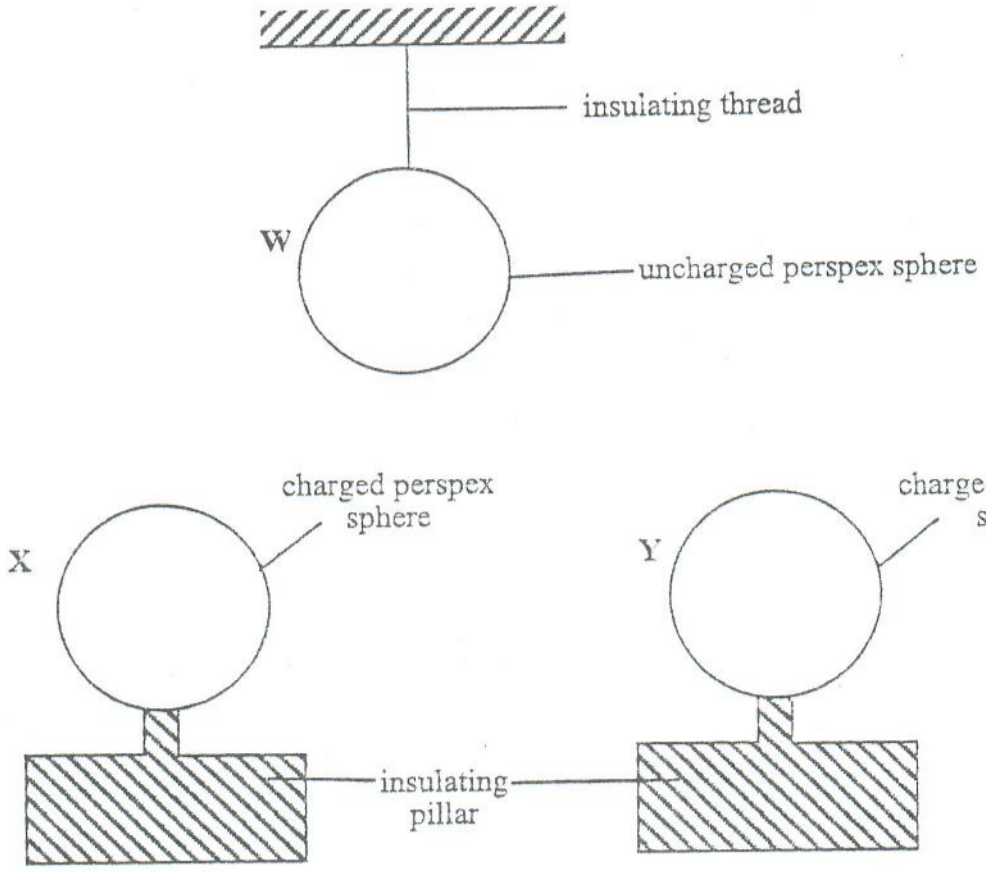


Fig. 4

What observations are made when charged spheres X and Y are brought in turn near to W?

X _____

Y _____ [2]

Total [10]

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Ordinary Level

POSSIBLE ANSWERS

NOVEMBER 2010

INTEGRATED SCIENCE 5006/3

1 (a) (i) leaf blade length (x) (cm) 2.0 1.5 1.9

root length (cm) 2.5 1.6 1.5

(all measurements : ± 0.1 cm) [3]

(ii) (solution) B [1]

(iii) (solution) A [1]

(iv) nitrogen : encourages growth of leaves/shoot; [1]
phosphorus : encourages growth of roots [1]

(v) A [1]

(vi) Precaution : all containers in set-up to be covered with dark material [1]

Reason : prevents growth of algae [1]

Or
Precaution : cotton wool should not be in contact with the culture solution.

Reason : to prevent contamination of the culture solution.

[Total : 10]

2 (a) (i) piston moves upwards; [1]

(ii) air in syringe gains heat energy from hot water;
air particles move faster;
∴ air expands; [3]

(b) (i) completes the circuit/current flows through circuit; [1]

(ii) temperature rises;
water heated by resistance coil; [2]

(iii) electrical (energy) ⟶ heat (energy); [1]

(iv) voltmeter parallel to coil;
correct symbol of voltmeter; [2]

[Total : 10]

3 (a) (i) cathode: electrode connected to (-ve) terminal; [1]

(ii) arrow from positive terminal to external circuit; [1]

(b) (i) copper/Cu; [1]

(ii) aqueous copper sulphate/the electrolyte; [1]

(c) (i)

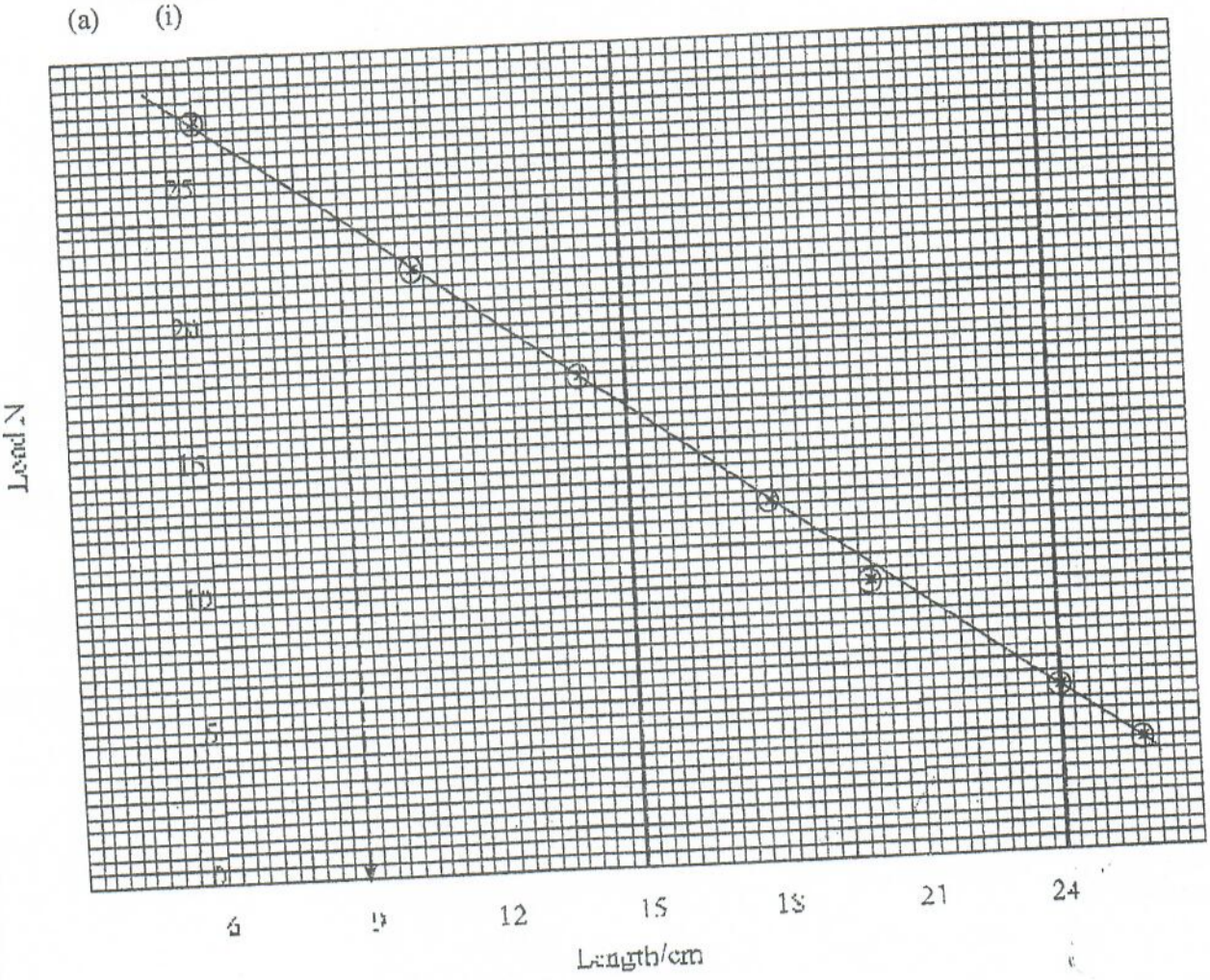
time/(min)	total increase in mass (g)
20	0.90
30	1.36

[2]

(ii) discharge of copper caused electrolyte to become acidic/sulphuric acid, solution becomes acidic [1]

(iii) Anode: impure copper;
Cathode : thin strip of pure copper;
Electrolyte : addition of dilute sulphuric acid to electrolyte; [3]
[Total : 10]

4 (a) (i)



(Label; Scale; Plotting; Joining;) [3]

Labels: both axes labelled fully;
Scale: continuous scale covering more than 75% of graph space;
Plotting: all points correctly plotted;
Joining: all points joined;

(ii) length of beam : 9 cm; [1]

(iii) As length of beam increases, the strength of the beam decreases/converse [1]

(iv) piers are used to support the bridge; [1]

(v) Type of material: steel; [1]
Reason for choice: strong in tension and compression; [1]

(b) W moves towards X; [1]

w moves towards Y; [1]

[1]
[Total : 10]