



Coimisiún na Scrúduithe Stáit State Examinations Commission

JUNIOR CERTIFICATE EXAMINATION, 2006

SCIENCE (REVISED SYLLABUS) – ORDINARY LEVEL

THURSDAY, 15 JUNE – MORNING, 9.30 to 11.30

INSTRUCTIONS

1. Write your **examination number** in the box provided on this page.
2. Answer **all** questions.
3. Answer the questions in the spaces provided in this booklet. If you require extra space, there is a blank page provided at the back of this booklet.

Centre Number

Examination Number

For examiner use only	
Section/Question	Mark
Biology	
Q.1 (52)	
Q.2 (39)	
Q.3 (39)	
Chemistry	
Q.4 (52)	
Q.5 (39)	
Q.6 (39)	
Physics	
Q.7 (52)	
Q.8 (39)	
Q.9 (39)	
Coursework	
Coursework A (60)	
Coursework B (150)	
Total (600)	
Grade	

Biology

Question 1

(52)

For
examiner
use only

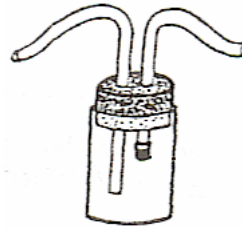
- (a) The piece of equipment drawn on the right is used in ecology.

Name the piece of equipment.

Name _____

Give one use of this piece of equipment.

Use _____



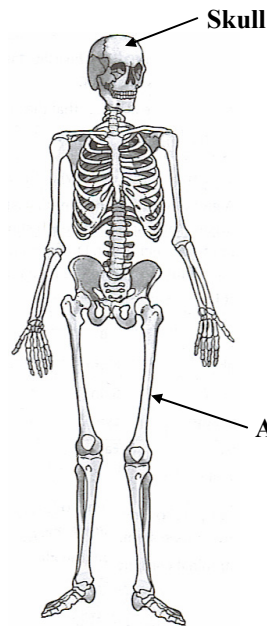
(1) | (2)

- (b) Name the bone of the human skeleton labelled A in the diagram on the right.

Name A _____

Name an organ that is protected by the skull.

Organ _____

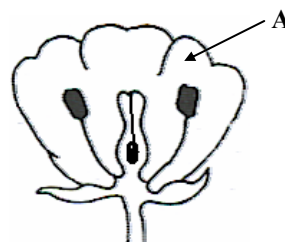


- (c) Name the part of the flower labelled A in the diagram.

Name of A _____

Give one reason why insects are attracted to flowers.

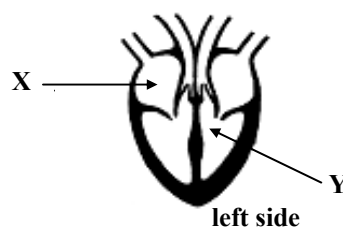
Reason _____



- (d) Name the chambers of the heart labelled X and Y in the diagram.

Name of X _____

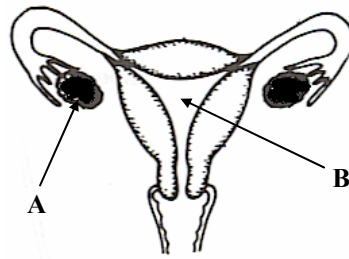
Name of Y _____



(e) **Name** the parts of the female reproductive system labelled **A** and **B** in the diagram on the right.

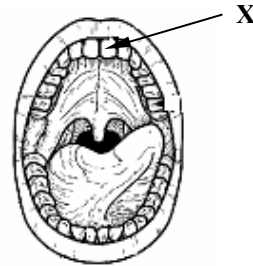
Name A _____

Name B _____



(f) Identify the **type of tooth** labelled **X** in the diagram on the right.

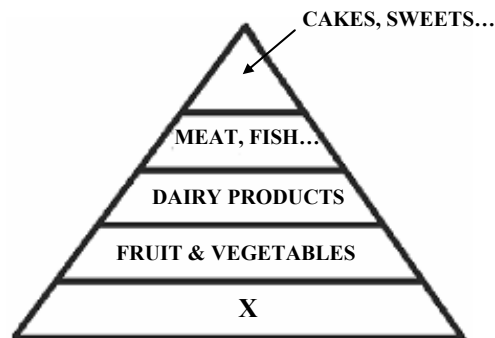
Name the **mineral** needed for healthy growth of teeth.



(g) The diagram shows a food pyramid.

Name one item of food that could be found at **X** in the pyramid.

Why should only a small amount of the foods at the top of the pyramid be eaten?

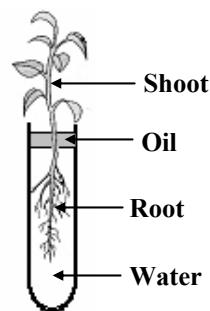


(h) The plant in the test tube drawn on the right was allowed stand in the laboratory for a few days to investigate the transport of water in the plant.

Which **part** of the plant takes in water?

What would you notice about the **level of water** in the test tube after a few days?

Why is it necessary to put **oil** on the surface of the water in the test tube?



(7 × 6 + 1 × 10)

For
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(1)

(2)

Question 2

(39)

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- (a) Blood helps transport food and other materials around the body. It also helps fight infection.

(1) (2)

Name the liquid part of blood that helps transport materials. (3)

Name _____

Name the blood cells that help fight infection. (3)

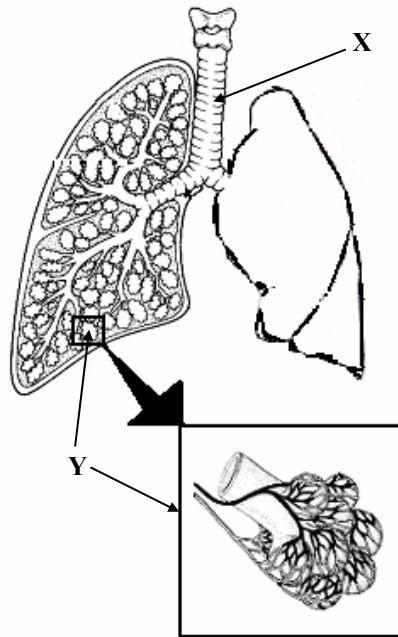
Name _____

- (b) The heart pumps blood to the lungs and around the body. The diagram shows part of the breathing system.

- (i) **Name** the parts of the breathing system labelled **X** and **Y** in the diagram. (6)

Name of X

Name of Y



- (ii) Complete the sentence below using a word from the list on the right. (3)

There is **more** _____ in exhaled air than in inhaled air.

- | |
|-----------------------|
| OXYGEN |
| CARBON DIOXIDE |
| HYDROGEN |

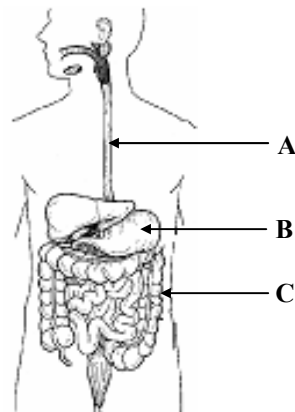
- (iii) A balance of exercise and rest promotes good health. Name one activity which has a **harmful effect** on the breathing system. (3)

Harmful activity _____

(c) Digestion of food is important so that we can obtain energy from our food.

(i) **Name** the parts of the digestive system labelled **A**, **B** and **C** in the diagram.

(9)



Name of A _____

Name of B _____

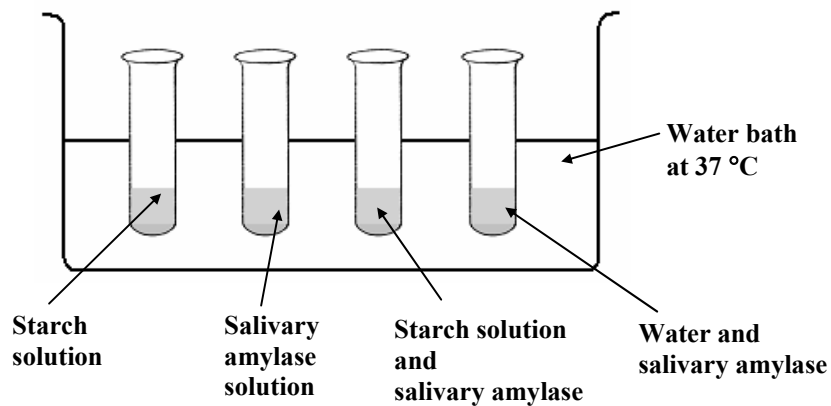
Name of C _____

(ii) Give **one** function of the part of the digestive system labelled **B**.

(3)

Function of B _____

(iii) **Salivary amylase** found in the mouth acts on starch in the food we eat. This action can be investigated in the laboratory.



Name the chemical used to test for the **presence of starch** at the beginning of the experiment. _____ (3)

When the salivary amylase is added to starch solution and the mixture placed in a water bath at 37 °C for 5 minutes, a new product is formed. **Name the product formed.** (3)

Name of product _____

Another **chemical** is used to test for the presence of this **new product**. This chemical reacts with the new product to produce a brick-red colour when they are heated together in a hot water bath for 5 minutes. **Name this chemical.** (3)

Name _____

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(1) (2)

Question 3

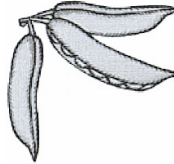
(39)

- (a) Plants produce a wide variety of seed types which need to be dispersed (scattered) in order to avoid competition.



A

Identify how the seeds **A** and **B** in the diagram are dispersed. (6)



B

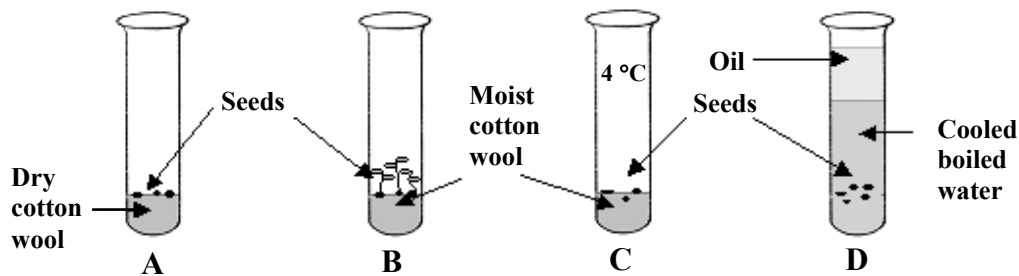
Seed A _____

Seed B _____

Name one resource that seeds must compete for with the parent plant. (3)

Resource _____

- (b) A number of cress seeds were set up as shown in the diagram and left for a few days to **investigate the conditions necessary for germination**. Test tubes **A**, **B** and **D** were kept in the laboratory at room temperature. Test tube **C** was placed in the fridge at 4 °C.



- (i) Why do only the seeds in test tubes **B** germinate? (3)

Why? _____

- (ii) **Why** is the water in test tube **D** boiled before use? (3)

- (iii) **Explain** why the seeds in test tube **C** failed to germinate. (3)

- (iv) Why is this investigation considered to be a “**fair test**”? (3)

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(1) (2)

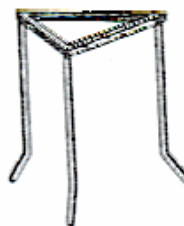
Chemistry

Question 4

(52)

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- (a) Name the piece of equipment drawn on the right.



Give **one** use of this piece of equipment.

Name _____

Use _____

(1) | (2)

- (b) Natural gas is mainly **methane** (CH_4).

Name one of the two elements found in methane. _____

Name one **gas** produced when methane is burned in air.

- (c) Complete the table below identifying **one mixture** and **one compound** from the list on the right.

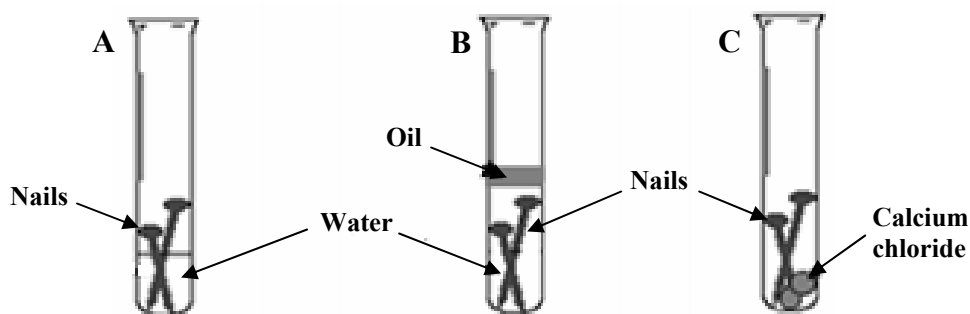
MIXTURE	COMPOUND

TABLE SALT

CARBON

AIR

- (d) The diagram shows three experiments which were set up to investigate **rusting**. Study the diagram and answer the questions below.



In which test tube **A**, **B**, or **C** will the nail rust?

Which? _____

What is the function of the calcium chloride in test tube **C**?

Function _____

(e) **Complete** the statements below using one of the words from the list on the right in each case.

Protons are _____ charged particles.

Electrons are _____ charged particles.

NEGATIVELY

POSITIVELY

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(1) (2)

(f) **Water** is essential for life and is composed of two elements.

Name one of the elements that make up water. _____

Name a **chemical** that can be used to test for the presence of water.

(g) The picture shows a plastic crate.

Name the raw material used in the making of plastics. _____

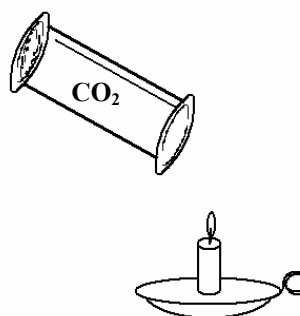


Most plastics are **non-biodegradable**.

Explain what is meant by the term non-biodegradable.

(h) The diagram shows a gas jar of **carbon dioxide** gas being poured onto a lighting candle.

What happens to the **lighting candle** when the carbon dioxide gas is poured over it?



What does this tell us about carbon dioxide gas?

Name the chemical that turns milky white if carbon dioxide is bubbled through it.

(7 × 6 + 1 × 10)

Question 5

(39)

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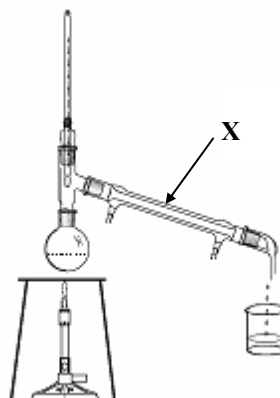
(a) Separation techniques are very important in chemistry.

(i) What is the **name** given to the separation technique shown in the diagram? (3)

Technique _____

(ii) Name **two** substances which could be separated using this technique? (3)

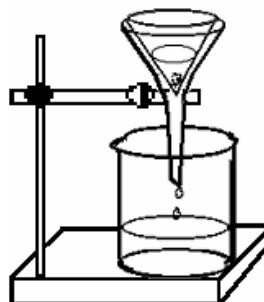
Substances _____



(iii) **Name** the part of the apparatus labelled X in the diagram. (3)

(iv) What is the **name** given to the separation technique shown in diagram on the right? (3)

Name _____



(b) The **bond** in a molecule of hydrogen gas is formed by a shared pair of electrons.

Name the type of bond found in hydrogen gas. _____ (3)

The bonds in sodium chloride are formed by sodium atoms **losing electrons** and chlorine atoms **gaining electrons**.

Name the type of bond found in a sodium chloride crystal. (3)

Type of bonding in sodium chloride _____

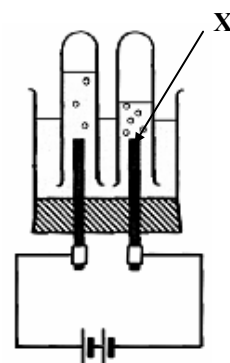
(1) (2)

- (c) The diagram shows an arrangement of apparatus suitable for the electrolysis of acidified water.

Name the gas produced at the electrode **X** and **state a test** for this gas. (9)

Gas produced at **X** _____

Test for this gas _____



- (d) When hydrochloric acid reacts with sodium hydroxide to neutralise each other, a salt and water are formed. Some of the pieces of equipment used in this experiment are shown in the diagram.

- (i) **Name** the piece of equipment labelled **A**. (3)

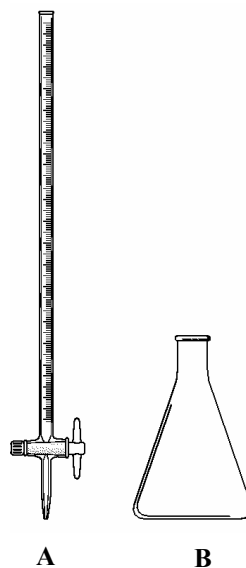
Name _____

- (ii) Name the **salt** formed when sodium hydroxide is neutralised by hydrochloric acid? (3)

Name _____

- (iii) Which piece of equipment **A** or **B** is usually used to measure the hydrochloric acid during this experiment? (3)

- (iv) How can you tell by using an indicator that enough hydrochloric acid has been added to neutralise the sodium hydroxide? (3)



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(1) (2)

Question 6

(39)

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(a) Many substances found in the home are acids or bases.

Complete the table below identifying **one acid** and **one base** from the list on the right. (6)

Acid	Base

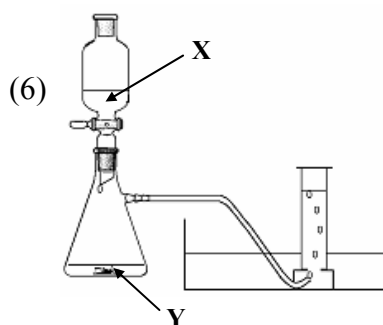
- VINEGAR**

WATER

OVEN CLEANER

(1) (2)

(b) **Oxygen** gas can be prepared in a school laboratory using the apparatus drawn on the right.



(i) Identify a liquid **X** and a solid **Y** that can be used in this preparation.

Liquid X _____

Solid Y _____

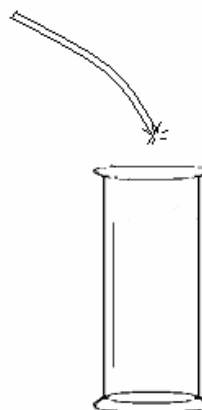
(ii) Solid **Y** **speeds** up the breakdown of liquid **X**. What **name** is given to this type of chemical? (6)

(b) What happens when a “glowing splint” (very hot piece of wood) is placed in a gas jar of oxygen? (6)

What? _____

Give **one property** of oxygen that this demonstrates. (3)

Property _____



Physics

Question 7

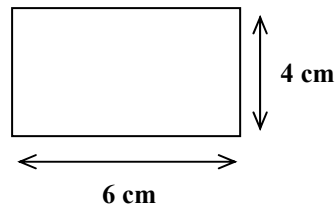
(52)

- (a) Find the **area** of the rectangle drawn on the right using the measurements given.

Area _____

In what **unit** is the area measured?

Unit _____

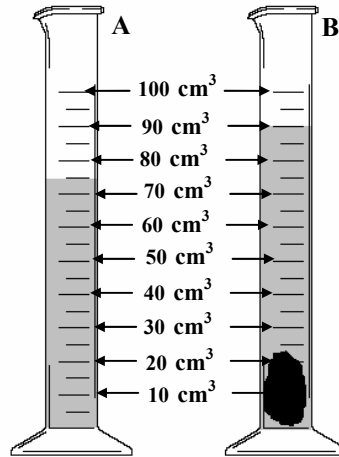


- (b) The diagram shows a piece of equipment, labelled **A**, containing water. **Name A**.

Name A _____

A stone was then added and a new volume was recorded as shown in **B**.

What was the volume of the stone in cm^3 ?



- (c) **Heat** may be transferred from hot to cold places by the three methods listed on the right.

Choose the method of heat transfer that occurs in each of the following.

The boiling of water in a kettle.

The heating of the Earth by the Sun.

CONDUCTION
CONVECTION
RADIATION

- (d) The picture shows a flash of lightning.
What type of energy generates lightning?

The flash of lightning is seen before the thunder is heard. **What** does this tell us about the speed of light?

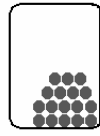


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(1)

(2)

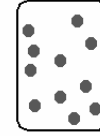
(e) The diagrams on the right show the arrangement of particles in a solid, a liquid and a gas.



A



B



C

Which diagram **A**, **B** or **C** shows a gas?

Name the physical change that takes place when **A** changes into **B**.

Physical change _____

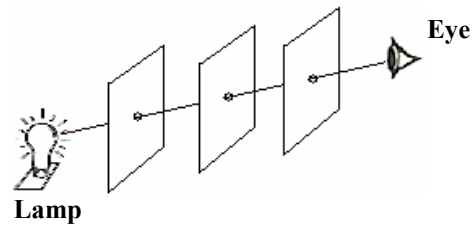
(f) **Complete** the equation in the box below using the words on the right.

Pressure = _____

AREA
FORCE

Name the piece of equipment used to measure pressure?

(g) The equipment shown in the diagram was set up and used in an experiment on light.



What would the eye on the right see if the middle card was moved slightly?

What does this experiment tell us about light?

(h) The diagram shows a bar magnet.

Draw the pattern made if iron filings or plotting compasses were placed around the bar magnet.



Give one **use** of a magnet?

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(1) | (2)

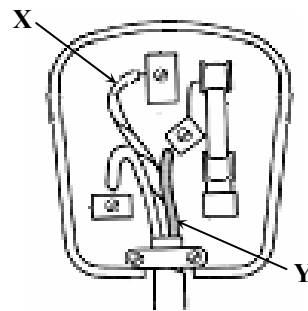
(7 × 6 + 1 × 10)

Question 8

(39)

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(a) The diagram shows a three-pin plug with the back removed.



(i) What is the correct names for the cables labelled X and Y.

Name of X _____ (3)

Name of Y _____ (3)

(ii) Give **one** reason why the back covering (casing) of a plug is made from plastic. (3)

Reason _____

(b) Appliances vary in the amount of electricity they use depending on their power rating.

A **tumble drier** has a high power rating of 2.5 kW.



(i) **Name** another appliance found in the home that has a **high power rating**.

Name _____ (3)

(ii) **Name** an appliance found in the home that has a **low power rating**.

Name _____ (3)

(iii) The ESB charges for electricity at a rate of 12 cent per kW h. A tumble drier of power rating 2.5 kW is used for 2 hours each week for 4 weeks.

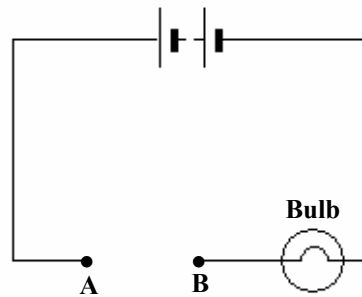
How many units of electricity are used?

Number of units _____ kW h (3)

What is the **cost, in cent**, of using the tumble drier? (3)

Cost _____ cent

(c) A student set up the circuit drawn on the right to investigate different materials to see which were electrical conductors and which were electrical insulators.



(i) What would you **expect to observe** when an **electrical conductor** is connected between the contact points **A** and **B**? (3)

Give a **reason** for your answer. (3)

Observation _____

Reason _____

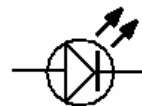
(i) What would you **expect to observe** when an **electrical insulator** is connected between the contact points **A** and **B**? (3)

Give a **reason** for your answer. (3)

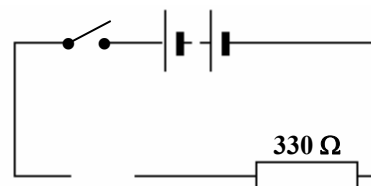
Observation _____

Reason _____

(d) The diagram shows the symbol of a **LED**.



Complete the circuit on the right by drawing in the LED so that the **LED will light** when the switch is closed. (3)



Why is there a resistor connected in series with the **LED**? (3)

Why? _____

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(1)	(2)

Question 9

(39)

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(a) Friction is an example of a **force**.

(i) Give **another example** of a force. (3)

(ii) Give one way to **reduce** friction. (3)

(iii) After what scientist is the **unit** of force named? (3)

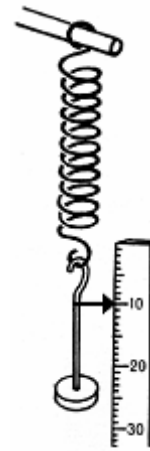
Name _____

(b) A student carried out an investigation to examine the **relationship** between the **extension** (increase in length) **of a spring** and the **force applied** to it.

The diagram shows the apparatus used.

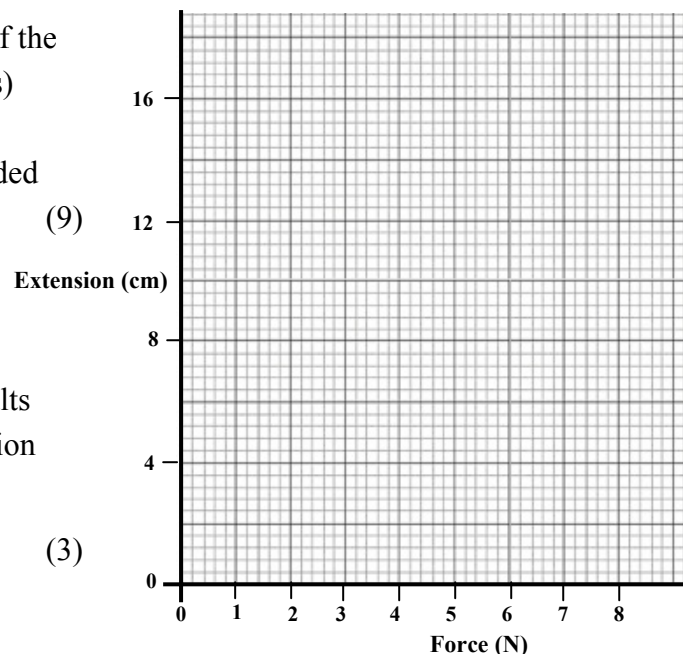
The table shows the data collected by the student.

Force (N)	0	2	4	6	8
Extension (cm)	0	4	8	12	16



(i) **Describe** how the student could have taken any one of these measurements. (6)

(ii) **Draw a graph** of the extension (*y*-axis) against the force in the grid provided on the right. (9)



(iii) **What force** results in a **6 cm** extension of the spring?
_____ N (3)

