AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA **S36**

JUNIOR CERTIFICATE EXAMINATION, 2002

SCIENCE – ORDINARY LEVEL

[N.B. Not for Science – Local Studies Candidates]

THURSDAY, 13 JUNE – AFTERNOON, 2.00 to 4.30

INSTRUCTIONS

1. Write your **examination number** in the box provided on this page.
2. Answer **SECTION A.**
3. Answer **ANY THREE SECTIONS** from **SECTIONS B, C, D, E.**
4. Answer **all questions** in the spaces provided. If you require extra space, there are pages provided at the back of this booklet.

Centre Number

Examination Number

For examiner use only

1. Total of end of page totals	
2. Aggregate total of all disallowed question(s)	
3. Total marks awarded (1 minus 2)	

For examiner use only

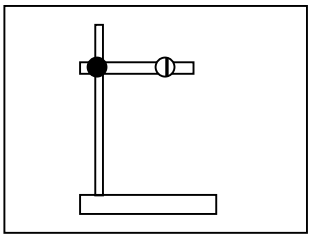
QUESTION		MARK
Section A	**Q.1**	
Section B	**Q.2**	
	Q.3	
	Q.4	
Section C	**Q.5**	
	Q.6	
	Q.7	
Section D	**Q.8**	
	Q.9	
	Q.10	
Section E	**Q.11**	
	Q.12	
	Q.13	
	Q.14	
	Q.15	
	Q.16	
TOTAL		
GRADE		

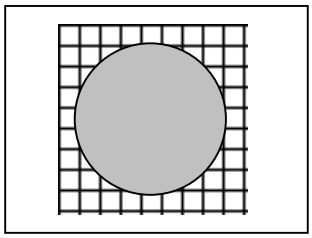
SECTION A – CORE (144 MARKS)

Answer any 12 parts (a), (b), (c), etc. from this Section.

Question 1

(a) **Name** and give **one use** for the following pieces of apparatus.



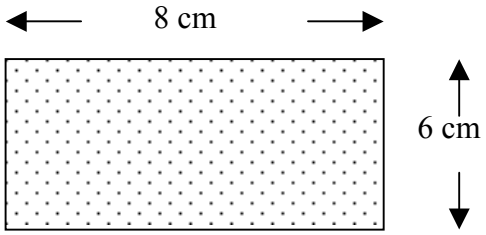


NAME _____ **NAME** _____

USE _____ **USE** _____

(b) A _____ is an **instrument** used to measure the length of a **straight** line.

An _____ is an **instrument** used to measure the length of a **curved** line.



Area is measured in cm². **Area = length ×** _____.

The **area of the rectangle** in the diagram is _____ cm².

(c) Choose a **word** from the list on the right to **complete** the following sentences.

Heat travels from the Sun to Earth by _____

Water being boiled in a kettle is heated by _____

Heat travels through a metal spoon by _____

Water _____ when it is cooled below 4 °C.

CONVECTION
CONDUCTION
EXPANDS
RADIATION

(d) The **Solar System** is made up of the Sun and **nine** planets.

Name the planet **nearest** to the Sun. _____

Name the planet **furthest** from the Sun. _____

Give **two** reasons why **Earth** can support life.

1 _____ 2 _____

(e) What is measured in **amperes (amps)**? _____

What does a **voltmeter** measure? _____

Why is a **fuse** or **circuit breaker** used in electrical circuits?

_____

(f) Match each **arrow** in the diagram with the correct **term** from the list below.

A _____

B _____

C _____

D _____

EVAPORATION
CONDENSATION
FREEZING
MELTING

(g) Choose a **word** from the list on the right to **complete** the following table.

Seawater	
Hydrogen	
Rust	

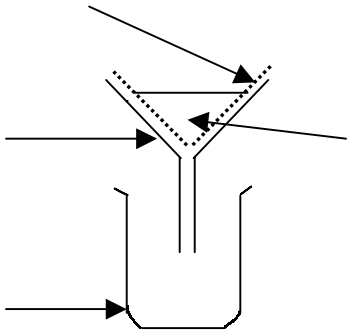
ELEMENT
COMPOUND
MIXTURE

Give **one** other example of an **element**. _____

SECTION A

(h) A **mixture of soil and water** was separated using the method shown in the diagram.

Name this method of separation.

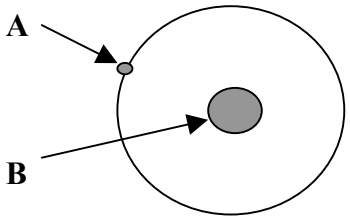


(i) The diagram shows an **atom**. What is an **ATOM**?

_____

Name part **A**. _____

Name part **B**. _____



(j) A **solution** is formed when **sugar** is dissolved in **water**.

Name the **solvent**. _____

Give **one** other example of a **solution.** _____

To make the solution **more concentrated** more _____ is added.

To make the solution **more dilute** more _____ is added.

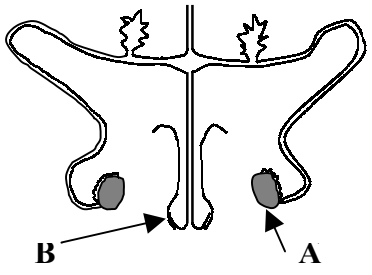
(k) The diagram shows the **male reproductive system**.

Name part **A**. _____

Name part **B**. _____

Name **one** substance produced by **A**.

_____



SECTION A

(l) All **animals** need **food** for survival.

Give **one source** and **one function** for each food type listed in the table below.

FOOD TYPE	SOURCE	FUNCTION
PROTEIN		
FAT		

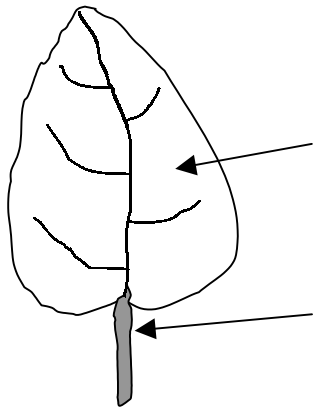
(m) To **pollute** means to dirty or contaminate the **environment**.

Give **two causes** of **air** pollution.

1 _____ 2 _____

Give **two harmful effects** of **water** pollution.

1 _____ 2 _____



(o) **Micro-organisms** are very small organisms. **Bacteria** are one type of micro-organism.

Name **two** other types of **micro-organism**.

1 _____ 2 _____

State **one** way in which **bacteria** are **useful** to humans.

_____

State **one** way in which **bacteria** are **harmful** to humans.

_____

SECTION B – PHYSICS (72 MARKS)

There are THREE questions in this Section. Answer any TWO of these questions.

Question 2

(b) We can reduce heat loss by using **heat insulators** in our homes.

What is an **insulator**?

_____ (6)

Give **two** examples of **heat insulation** in your home. (6)

1 _____ 2 _____

(c) Describe, with the aid of a labelled diagram, an experiment to **show that solids expand when heated**. (12)

_____

_____

_____

_____

_____

_____

_____

_____

Labelled diagram

Question 3

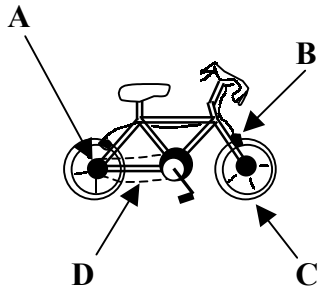
(a) A **lever** is a rigid _____ which is free to turn around a fixed point called the _____. (6)

Give **two** examples of **levers** in your home. (6)

1 _____ 2 _____

(b) The diagram shows a bicycle. **Complete** the table below by stating whether **friction** is **USEFUL or NOT USEFUL**. (12)

A Axles and wheels	
B Brake blocks and wheels	
C Bicycle tyre and road	
D Links of chain	



(c) Describe, with the aid of a labelled diagram, how you would **measure the volume of a stone**. (12)

_____

_____

_____

_____

_____

_____

_____

_____

Labelled diagram

SECTION B

Question 4

(a) Choose a **term** from the list on the right to **complete** the sentences below.

Sound is a **form** of _____ (3)

Sounds are **produced** by _____ bodies. (3)

A **reflected** sound is called an _____ (3)

Sound **cannot travel** through a _____ (3)

VIBRATING

(b) The diagram shows a **simple circuit**.

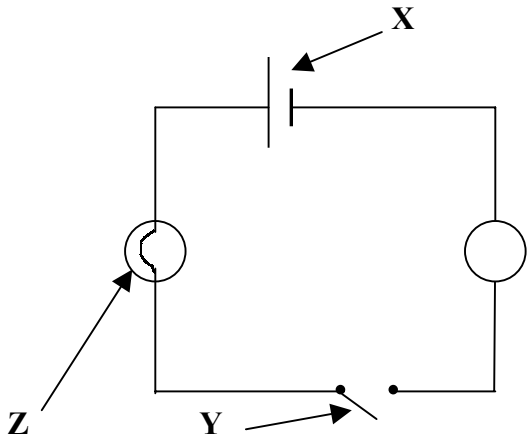
Name part **X**. _____ (3)

Name part **Y**. _____ (3)

Name part **Z**. _____ (3)

What is the **function** of **Y**?

_____ (3)



(c) Describe, with the aid of a labelled diagram, an experiment to **show the magnetic field around a bar magnet**. (12)

_____

_____

_____

_____

_____

_____

_____

_____

Labelled diagram

SECTION C – CHEMISTRY (72 MARKS)

There are THREE questions in this Section. Answer any TWO of these questions.

Question 5

(a) The diagram shows a **Bunsen burner**, which is used for heating.

Name part **A**. _____ (3)

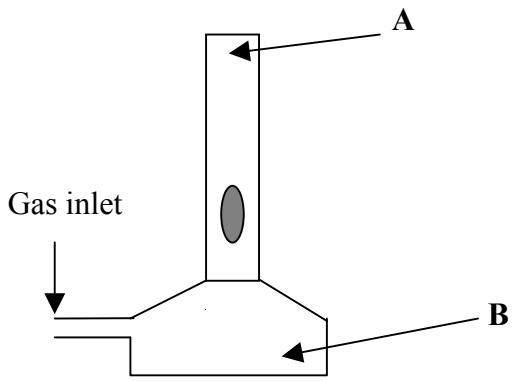
Name part **B**. _____ (3)

How can the Bunsen **flame** be changed? (3)

_____

Give **one safety precaution** you would take when using a Bunsen burner for heating. (3)

_____



(b) Which of the **elements** from the list on the right is:

a **metal** which floats on water _____(3)

a **gas** needed for breathing _____(3)

used in **electrical** cables _____(3)

used in **fertilizers** _____(3)

OXYGEN

(c) When iron filings and sulphur are heated together, a **compound** is formed.

(i) What is a **compound**? (6)

_____

(ii) **Name** the **compound** which is formed when iron filings and sulphur are heated. (3)

_____

(iii) Give **one property** of a **chemical** change. (3)

_____

(a) The **pH** of a substance can be measured using **universal indicator**.

(i) Explain the term **indicator**. _____ (6)

_____

(ii) Choose a **substance** from the list on the right which has

a pH **less** than 7 _____(3)

a pH **greater** than 7 _____(3)

ORANGE JUICE
TOOTHPASTE
DISTILLED WATER

(b) Water is **treated** in various ways to make it suitable for drinking.

Match a **treatment** from the list on the right with a **statement** below.

Removal of large **floating debris** _____(3)

Helps **prevent** tooth decay _____(3)

Kills all **germs** _____(3)

Allows **large particles** to sink to the bottom of a tank _____(3)

(c) Describe, with the aid of a labelled diagram, an experiment to **show the presence of water vapour in air**. (12)

_____

_____

_____

_____

_____

_____

_____

_____

Labelled diagram

SECTION C

Question 7

(a) **Water** can be used in a **fire extinguisher**.

(i) Name **one** other substance used in a fire extinguisher. (3)

_____

(ii) Why should water not be used on **electrical fires**? (3)

_____

(iii) Name **two** things that are needed to keep a fire burning. (6)

1 _____ 2 _____

(b) **Air** contains approximately **21% oxygen**.

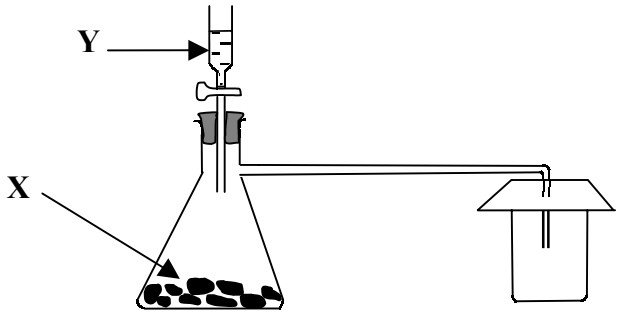
(i) What is the **test** for oxygen gas? (6)

_____

(ii) Name **two** other gases found in air. (6)

1 _____ 2 _____

(c) The diagram shows the apparatus used **to prepare and collect carbon dioxide**.



Name **solid X**. _____ (3)

Name **liquid Y**. _____ (3)

Carbon dioxide turns _____ milky. (3)

Carbon dioxide is _____ than air. (3)

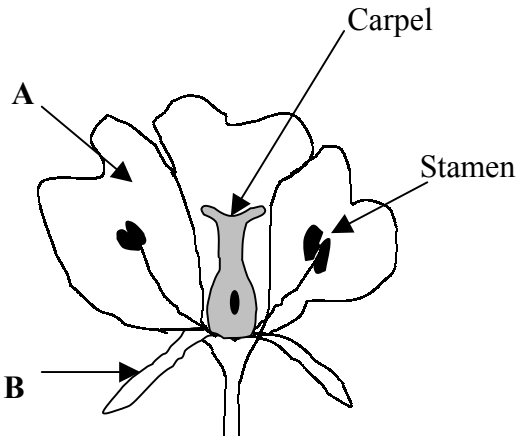
SECTION C

SECTION D – BIOLOGY (72 MARKS)

There are THREE questions in this Section. Answer any TWO of these questions.

Question 8

(a) The diagram shows the **structure** of a flower.



Name part **A**. _____ (3)

Name part **B**. _____ (3)

What is **produced** by the stamen? (3)

_____

What is **produced** by the carpel? (3)

_____

(b) It is important that plants **disperse** (scatter) their seeds. Name **two** ways in which plants **disperse** their seeds. (6)

1 _____ 2 _____

Germination is the **growth of a seed** into a new plant. In addition to **moisture (water)**, name **two** other things a seed needs for germination. (6)

1_____ 2 _____

(c) Describe how you would **examine onion cells** under the microscope. (12)

_____

_____

_____

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_____

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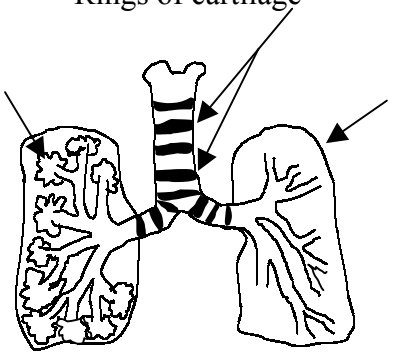
_____

Question 9

(a) The diagram shows the human **breathing system**.



(i) Name part **A**. _____ (3)

Name part **B**. _____ (3)

(ii) Name the part of the **skeleton** which **protects** our breathing system. _____ (3)

(iii) What do the **rings of cartilage** do? (3)

_____

PLASMA
WHITE BLOOD CELLS
RED BLOOD CORPUSCLES
PLATELETS

(c) The diagram shows part of the human **urinary system**.

(i) Name part **A**. _____ (3)

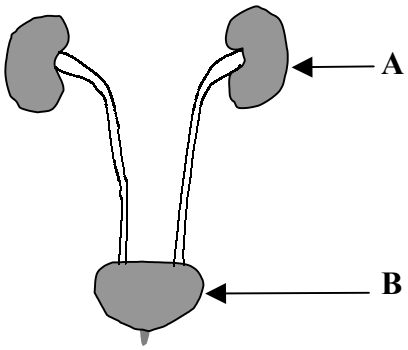
(ii) Name part **B**. _____ (3)

(iii) Name the **waste product** produced by **A**. (3)

_____

(iv) Name **one** other waste product which we excrete from the body. (3)

_____

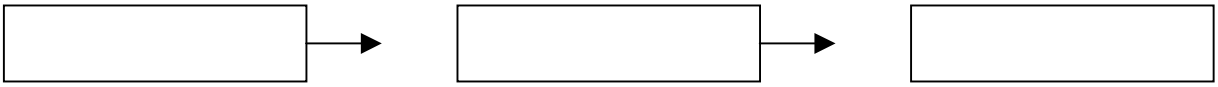


SECTION D

Question 10

(a) A **food chain** is a feeding relationship between organisms.

Use the **organisms** listed on the right to **complete** the food chain given below. (9)



Name a **habitat** where this food chain might be found. _____ (3)

(b) **Soil** has been formed by the **weathering** of rocks over thousands of years.

(i) Name **two** particles found in soil. (6)

1 _____ 2 _____

(ii) Name **one** mineral found in soil. _____ (3)

(iii) **Humus** is also found in soil. Give **one** reason why humus is important in soil. (3)

_____

(c) Describe, with the aid of a labelled diagram, how you would **show the presence of bacteria in soil**. (12)

_____

_____

_____

_____

_____

_____

_____

_____

Labelled diagram

SECTION D

SECTION E – APPLIED SCIENCE (72 MARKS)

There are SIX questions in this Section. Answer any TWO of these questions.

Question 11 - Earth Science

(a) The **Sun** is part of our **galaxy**.

(i) What is a **galaxy**? (6)

_____

(ii) **Name** our galaxy. _____ (3)

(iii) The **Sun** is a medium sized _____. (3)

(b) The Earth's movements cause **days**, **seasons** and **years**.

(i) The year **2000** was a leap year **(366 days)**. Explain why we have a **leap year**. (6)

_____

(ii) How long does it take the **Earth** to spin on its own axis? _____ (3)

(iii) The Earth's **axis is tilted** at an angle of 23.5° to the vertical. This causes the

_____ (3)

(c) Describe, with the aid of a labelled diagram, how you would **measure rainfall**. (12)

_____

_____

_____

_____

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_____

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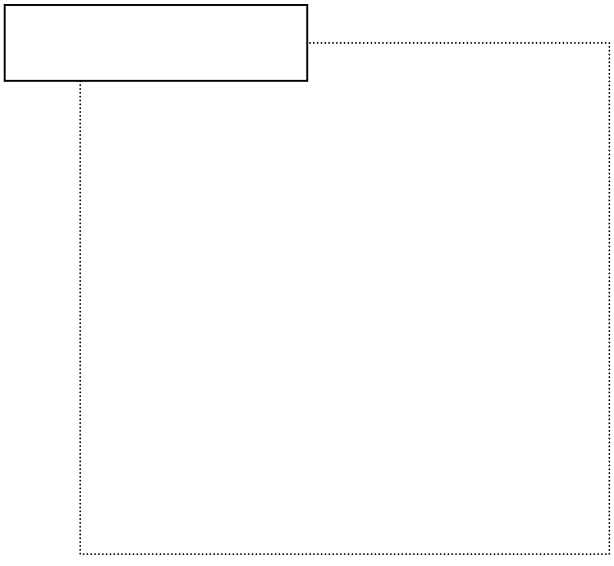


Question 12 - Horticulture

(a) An **earthworm** is considered to be the gardener's friend.

(i) State **two** ways in which the earthworm helps **soil fertility**. (6)

1 _____ 2 _____

(ii) Name **one plant** which you have grown. _____ (3)

(iii) Name **one pest** which attacks this plant. _____ (3)

(b) Plants can be **propagated** by taking **cuttings**.

One woody plant which can be propagated in this way is _____. (3)

One non-woody plant which can be propagated in this way is _____. (3)

Seeds often remain **dormant.** What does this mean? (6)

_____

(c) Describe, with the aid of a labelled diagram, how you would **measure the water content of a soil or compost**. (12)

Labelled diagram

_____

_____

_____

_____

_____

_____

_____

_____

Question 13 - Materials Science

(a) Materials can be **natural** or **synthetic** (man-made).

Choose a **term** from the list on the right to answer the following.

(i)	Name a **synthetic** textile.	_____	(3)
(ii)	Name a **natural** textile.	_____	(3)
(iii)	Name a **metal**.	_____	(3)
	Give **one use** for this metal.		(3)

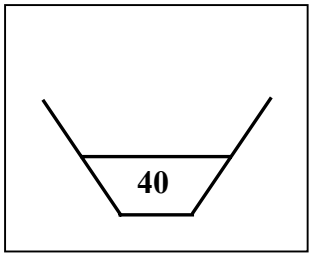
_____

WOOL
ALUMINIUM
NYLON

(b) **Care labels** are found on clothing.

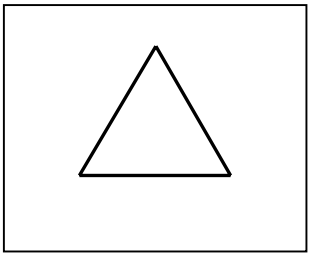
State what is meant by each of the **care labels** shown in the diagram. (6)

(i)



_____

(ii)



_____

(c) Answer **ANY ONE** of the questions **A (PLASTICS)**, **B (TEXTILES)**, **C (METALS)**, **D (TIMBER)**, which are on the following two pages.

>>>>>>>>>>>>>>>>>>

A - PLASTICS

(i) Most **plastics** are made from _____ (3)

(ii) Name **one** plastic. _____ (3)

(iii) Describe, with the aid of a labelled diagram, an experiment to **compare the hardness of two plastics**. (12)

_____

_____

_____

_____

_____

_____

_____

Labelled diagram

Choose a **term** from the list on the right to **complete** the following.

Fibres are used to make **yarn**. **Name** the procedure used. _____(3)

Give **one** way in which **fabrics** can be made from **yarn**. _____(3)

WEAVING

SPINNING

Describe, with the aid of a labelled diagram, an experiment to **compare the resistance to wear of two textiles**. (12)

_____

_____

_____

_____

_____

_____

_____

_____

Labelled diagram

SECTION E

C - METALS

(i) A metal can be **extracted** from its _____ by _____. (6)

(ii) Describe, with the aid of a labelled diagram, an experiment to **compare the flexibility of two metals**. (12)

_____

_____

_____

_____

_____

_____

_____

_____

Labelled diagram

D - TIMBER

(i) Name **one softwood**. _____ (3)

(ii) Give **one use** for the softwood you have named. _____ (3)

(iii) Describe, with the aid of a labelled diagram, an experiment to **investigate the effect of grain direction on the strength of wood**. (12)

_____

_____

_____

_____

_____

_____

_____

_____

Labelled diagram

Question 14 - Food

(a) Food is **preserved** to make it last longer.

(i) **Milk** is preserved by _____ (3)

(ii) **Name** a food which is preserved by **smoking**. _____ (3)

(iii) What is meant by **dehydration**? _____ (6)

(b) A **balanced diet** is important for a healthy life.

(i) What is a **balanced diet**? _____ (6)

_____

(ii) Why is **fibre** important in a balanced diet? _____ (3)

(iii) When **testing** for a particular food type using brown paper, a **translucent grease spot** is formed. (3)

Name this food type. _____

(c) Describe, with the aid of a labelled diagram, **how you would make yoghurt**. (12)

_____

_____

_____

_____

_____

_____

_____

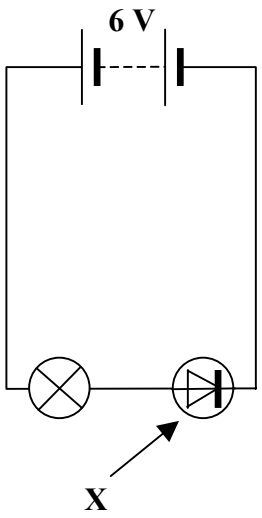
_____

Labelled diagram

SECTION E

Question 15 - Electronics

(a) The diagram shows a **circuit**.



Name the device labelled **X**. _____ (3)

Give **one** use for this device. (3)

_____

What happens the **lamp** in this circuit? (3)

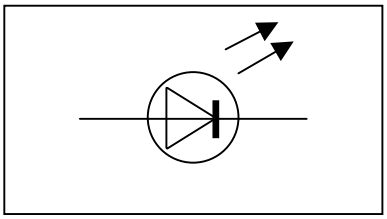
_____

The device **X** in the circuit is **connected** in (3)

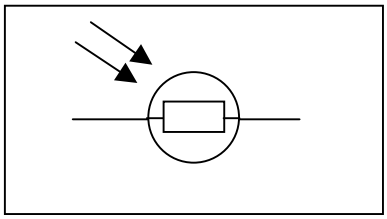
_____ **bias**.

(b) The diagrams below show two devices used in **electrical circuits**. **Name** and give **one use** for the following two devices. (12)

A



B



NAME _____ **NAME** _____

USE _____ **USE** _____

(c) Draw a circuit diagram to show **how the brightness of a bulb can be controlled by a variable resistor**. (12)

Circuit diagram

Question 16 - Energy Conversions

(a) **Energy** cannot be created or destroyed but can be **changed** from one form to another.

Use the **conversions** on the right to say what **energy conversion** takes place in (12)

an electric kettle _____

a dropping ball _____

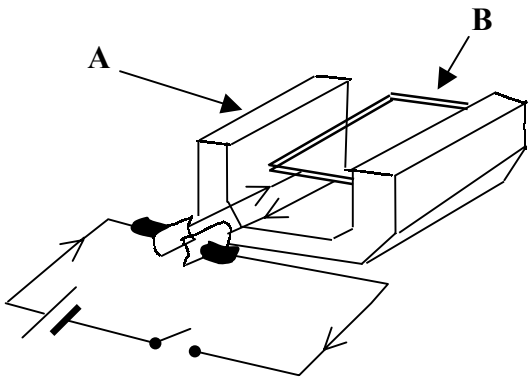
a battery _____

burning coal _____

Chemical to Heat
Electrical to Heat
Potential to Kinetic
Chemical to Electrical

(b) **Name** the **device** shown in the diagram. (3)

_____



Name part **A**. _____ (3)

What happens to part **B** when current flows in the circuit?_____ (3)

This device **converts** electrical energy to _____ energy. (3)

(c) Describe, with the aid of a labelled diagram, **how a battery**, **a length of insulated wire**, **a large iron nail**, **and a switch can be used to make a simple electromagnet, which can be used to lift some paper clips**. (12)

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Labelled diagram

SECTION E

EXTRA WORKSPACE

Indicate **clearly** the number of the question(s) you are answering.

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