2008. S36

Coimisiún na Scrúduithe Stáit
State Examinations Commission

JUNIOR CERTIFICATE EXAMINATION, 2008

SCIENCE - ORDINARY LEVEL

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

THURSDAY, 12 JUNE – MORNING, 9.30 to 12.00

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

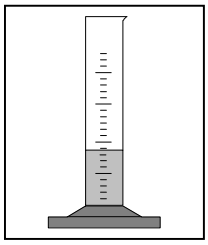
QUESTION		MARK
Section A	**Q.1**	
Section B	**Q.2**	
	Q.3	
	Q.4	
Section C	**Q.5**	
	Q.6	
	Q.7	
Section D	**Q.8**	
	Q.9	
	Q.10	
Section E	**Q.11**	
	Q.12	
	Q.13	
	Q.14	
	Q.15	
	Q.16	
TOTAL		
GRADE		

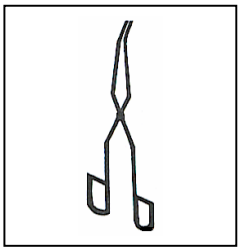
SECTION A – CORE (144 MARKS)

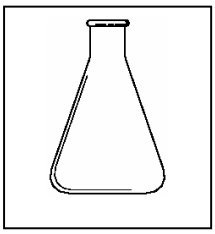
Answer any 12 parts (a), (b), (c), etc. from this Section.

Question 1

(a) Give one **use** for each of the following pieces of equipment.







USE _____ _____ _____ _____

_____ _____ _____ _____

(b) Energy sources can be **renewable** or **non-renewable**.

Give two examples of **renewable** sources of energy.

1 _____ 2 _____

Give two examples of **non-renewable** sources of energy.

1 _____ 2 _____

(c) The diagram shows a thermometer.

What is **measured** with a thermometer?

_____

Name the **liquid** that is used in a thermometer.

_____

Water **boils** at _____ ºC.

Water **freezes** at _____ ºC.

(d) Match the correct **unit of measurement** from the list on the right with each of the uses below.

Volume of milk in a carton _____

Distance from Kerry to Donegal _____

Diameter of a coin _____

Area of a leaf _____

cm^2
LITRE
mm
km

(e) The **solar system** is made up of the Sun and nine planets.

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

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

How long does it take the Earth to travel around the Sun? _____

Give **one** reason why living things are not found on any planet other than Earth.

_____

(f) Complete the table below. Choose the word from the list on the right that best describes each of the substances in the table.

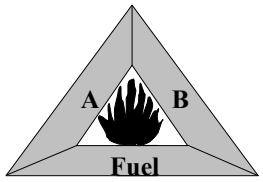
Seawater	
Nitrogen	
Rust	

ELEMENT
MIXTURE
COMPOUND

(g) A **fire triangle** is used to show the three things that a fire needs to burn.

What is represented by **A**? _____

What is represented by **B**? _____



Name a **substance** that can be used to put out fires.

_____

Name one **substance** that can be used as a fuel.

_____

(h) **Carbon dioxide** is a gas found in air.

Give one **use** for carbon dioxide gas. _____

What **effect** does carbon dioxide gas have on **limewater**? _____

_____

Name **one** of the elements that make up carbon dioxide gas. _____

Name one other **gas** found in air. _____

(i) What **colour** is litmus indicator in an **acid**? _____

In each case match a **substance** from the list on the right with the chemical property below that best describes that substance.

an acid _____

a base _____

neutral _____

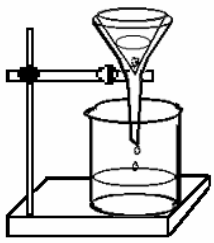
Orange juice
Oven cleaner
Distilled water
Toothpaste

(j) The diagram shows the apparatus to **separate a mixture of soil and water**.

Name the method of separation shown. _____

What would you place in the funnel to help separate the soil and water?

_____



Which substance, **soil** or **water**, will be found in the beaker at the

end of the experiment? _____

Why is this method **not suitable** for salt and water?

_____

(k) In each case choose the correct **organ** or **part of the body** from the list on the right, which does the following:

pumps **blood** around the body _____

makes **urine** _____

detects **light** _____

carries messages to the **brain** _____

EYE
KIDNEY
HEART
NERVES

(l) **Micro-organisms** are very small organisms. **Fungi** and **viruses** are two types of micro-organism.

Name a disease caused by a **virus**. _____

Name a disease caused by a **fungus**. _____

Name one other type of micro-organism. _____

State one way in which **fungi** are **helpful** to humans.

_____

(m) All animals need **food** for survival. Complete the table below. One row has been completed as an example.

Food type	Source	Function
Protein		
Carbohydrate		
Fat	Butter	Protection of organs

(n) The diagram shows a **flowering plant**.

Name the part labelled **A**.

_____

Name the part labelled **B**.

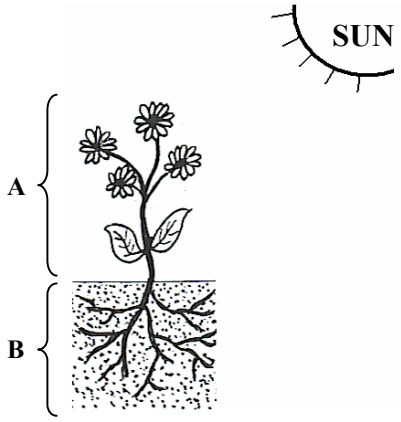
_____

Give one **function** of **A**.

_____

Give one **function** of **B**.

_____



(o) Reproduction and feeding are **characteristics of living things**.

Name two other characteristics of living things.

1 _____ 2 _____

State one way in which **plants** are important to people. _____

State one way in which **animals** are important to people. _____

SECTION B – PHYSICS (72 MARKS)

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

Question 2

(a) Match the correct **form of energy** from the list on the right with each of the following:

energy in a **stretched spring**	_____ (3)	**CHEMICAL**
energy stored in **food**	_____ (3)	**HEAT**
energy released from a **burning fire**	_____ (3)	**KINETIC**
energy in a **moving car**	_____ (3)	**POTENTIAL**

(b) Two metal cans of equal size were filled with water at 100 ºC. Can **A** was wrapped with cotton wool and can **B** was not.

After ten minutes, which can, **A** or **B**, would you expect to have the **higher** temperature?

_____ (3)

Why did this can have a higher temperature?

_____ (3)

Name two ways used to improve **insulation in the home**.

1 _____ 2 _____ (6)

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

_____

_____

_____

_____

_____

_____

_____

_____

Labelled diagram

Question 3

(a) Choose a **term** from the list on the right to **complete** each of the following sentences.

ECHO
VIBRATING
ENERGY
VACUUM

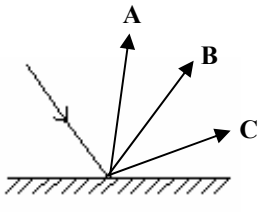
Sounds are produced by _____ bodies. (3)

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

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

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

(b) The diagram on the right shows a **ray of light** hitting a plane mirror.



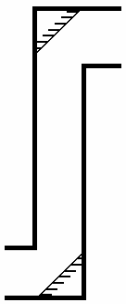
Which ray of light **A**, **B** or **C** is the ray that bounces back from the mirror?

_____ (3)

What **name** is given to the bouncing back of light?

_____ (3)

The diagram on the right shows a **piece of equipment** which uses mirrors.



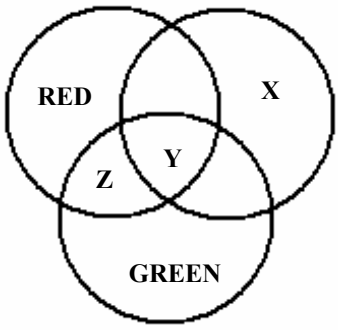
Name this piece of equipment. _____ (3)

Give one **use** for this piece of equipment. _____ (3)

(c) The diagram shows the **mixing of the three primary colours of light**.

Name the missing **primary** colour **X**.

_____ (3)



Name the **secondary** colour **Z**.

_____ (3)

Name the colour **Y** that is formed when the **three primary colours are mixed**.

_____ (3)

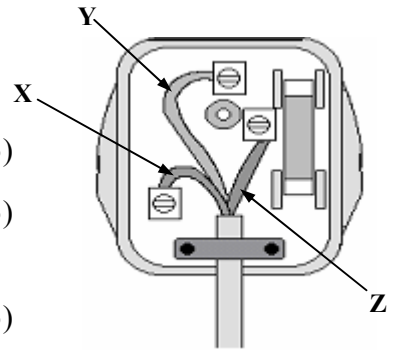
Dispersion is the splitting of light into its seven colours as in the rainbow. Name the triangular shaped piece of **glass equipment** used to do this in the laboratory.

_____ (3)

SECTION B

Question 4

(a) The diagram show a **three-pin plug** with its cover removed.



What **colour** is the insulating material on the wire labelled **Z**? _____ (3)

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

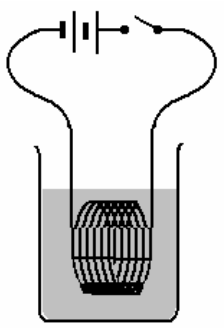
To which wire, **X**, **Y** or **Z**, should the fuse be attached?

_____ (3)

What is the **purpose** of the fuse?

_____ (3)

(b) The diagram shows an electric circuit. When the switch is closed an **electric current passes through the coil of wire** placed in a beaker of water.



What happens to the water in the beaker when the switch is **closed**?

_____ (3)

What **energy change** takes place?

_____ (3)

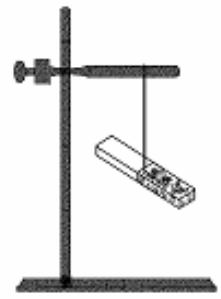
Name one **household appliance** based on this effect of electric current.

_____ (3)

Give one electrical **safety precaution** that should be taken in the home.

_____ (3)

(c) The diagram shows a **freely suspended magnet**.



What would you expect to notice if a **north pole** of another magnet was brought close to the **north pole** of the hanging magnet?_____ (3)

What would you expect to notice if a **south pole** of another magnet was brought close to the **north pole** of the hanging magnet?_____ (3)

Name a **metal** that is attracted by a magnet.

_____ (3)

Give one everyday **use** of a magnet.

_____ (3)

SECTION B

SECTION C – CHEMISTRY (72 MARKS)

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

Question 5

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

SOLVENT
DILUTE
DISSOLVES
CONCENTRATED

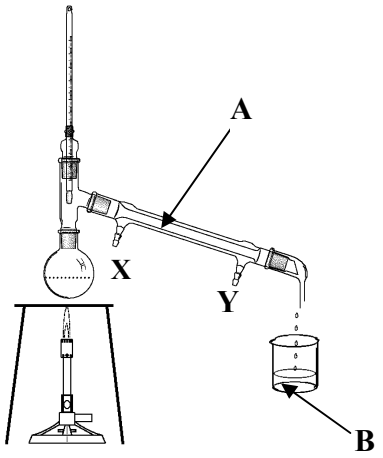
Sugar _____ in hot water. (3)

Water is a good _____. (3)

When a solution of water and sugar is **heated strongly** it gets more _____. (3)

When **more water** is added to the solution it gets more _____. (3)

(b) The diagram shows an apparatus that may be used to **separate water and a dye**.



Name this separation technique.

_____ (3)

Name the part labelled **A**.

_____ (3)

Which part, **X** or **Y**, is connected to the **cold tap**?

_____ (3)

After heating is started, liquid collects at **B**. Is the liquid that collects first mostly **dye** or mostly **water**?_____ (3)

(c) When **iron filings** and **sulphur** are mixed a **mixture** is formed.

How would you **separate** the iron filings from the sulphur? _____ (3)

How would you change the mixture of iron and sulphur into the **compound** iron sulphide?

_____ (3)

Metals such as iron are often used to make **alloys** like steel.

Name one other alloy. _____ (3)

Give one everyday **use** of the alloy you have named.

_____ (3)

Question 6

(a) **Protons**, **neutrons** and **electrons** are tiny particles found in atoms.

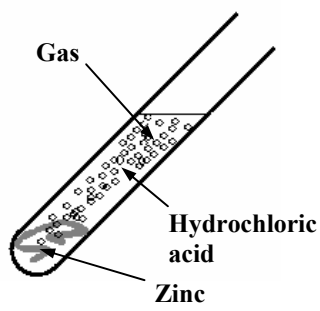
Name a particle that has a **positive** charge. _____ (3)

Name a particle that is found in the **nucleus**. _____ (3)

Name a particle that has **no charge**. _____ (3)

Name a particle that is **not found** in the nucleus. _____ (3)

(b) **Zinc** was added to some dilute **hydrochloric acid** in a test tube as shown in the diagram.



Name the **gas** given off in this reaction.

_____ (3)

Name **one** other metal that would give a similar result.

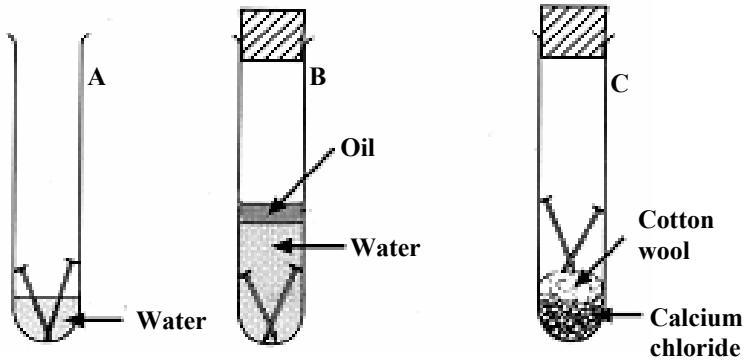
_____ (3)

Give **two safety precautions** that should be taken when carrying out this investigation in the laboratory.

1 _____

2 _____ (6)

(c) The diagram shows an experiment set up to investigate **rusting**.



In which test tube **A**, **B** or **C** will the nail rust? _____ (3)

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

_____ (3)

Give **two ways** to help prevent the rusting of iron.

1 _____

2 _____ (6)

SECTION C

Question 7

(a)

HELIUM	SULPHUR DIOXIDE	CHLORINE

Which **gas** from the list above dissolves in rain to form **acid rain**?

_____ (3)

Name one **fuel** which, when burnt, releases this gas. _____ (3)

Give one **harmful effect** of acid rain. _____ (3)

Name an **indicator** you could use to measure the **pH** of a liquid such as acid rain.

_____ (3)

(b) Two samples of water, **A** and **B**, were tested with soap solution to compare their **hardness**. Hardness can be **temporary** or **permanent**. The following results were recorded.

Water sample	**A**	**B**
Amount of soap solution needed to form a lather (cm^3)	6	18

Which sample **A** or **B** is the harder water sample? _____ (3)

How can **temporary** hardness be removed from hard water? _____ (3)

How could **permanent** hardness be removed? _____ (3)

Give one **advantage** of hard water. _____ (3)

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

_____

_____

_____

_____

_____

_____

_____

_____

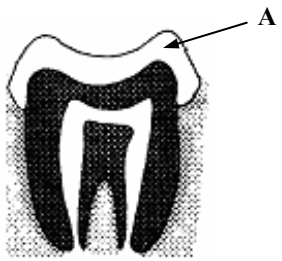
Labelled diagram

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 human **molar** tooth.



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

Give one **function** of this type of tooth.

_____ (3)

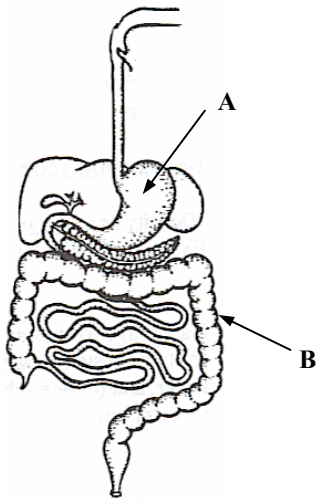
Name one other **type of tooth** in humans.

_____ (3)

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

_____ (3)

(b) The diagram shows part of the human **digestive system**.



Name the organ **A**.

_____ (3)

Name the organ **B**.

_____ (3)

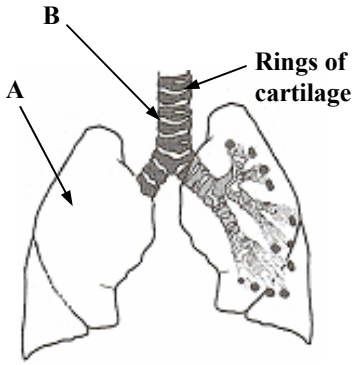
Give one **function** of organ **A**.

_____ (3)

Name one **chemical** involved in the digestion process.

_____ (3)

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



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

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

Name the part of the **skeleton** that protects the breathing system.

_____ (3)

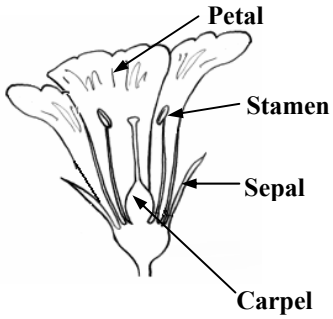
What do the **rings of cartilage** do?

_____ (3)

Question 9

(a) The diagram shows the **structure of a flower**. Study the diagram and answer the questions below.

Which **labelled part** of the flower does each of the following?



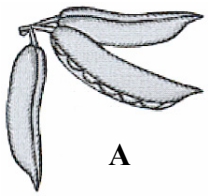
Protects the flower before it opens _____ (3)

Produces **male gamete** (sex cell) _____ (3)

Produces **female gamete** (sex cell) _____ (3)

Attracts insects to flower _____ (3)

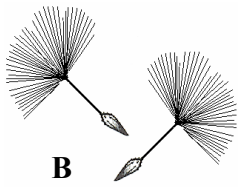
(b) Plants use different methods to **disperse** (scatter) their seeds. The diagram shows two different types of seeds.



Name the **method** by which each of the seeds **A** and **B** are dispersed.

Seed **A** _____ (3)

Seed **B** _____ (3)



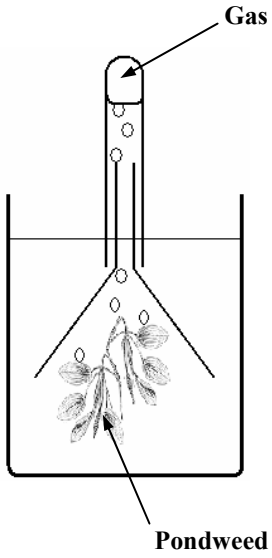
Give one **reason** why plants need to scatter their seeds.

_____ (3)

Name the **part** of the flowering plant that produces seeds.

_____ (3)

(c) The diagram shows an experiment on **photosynthesis**.



Name the **gas** that collects.

_____ (3)

Name a **part** of the plant where most of the photosynthesis takes place.

_____ (3)

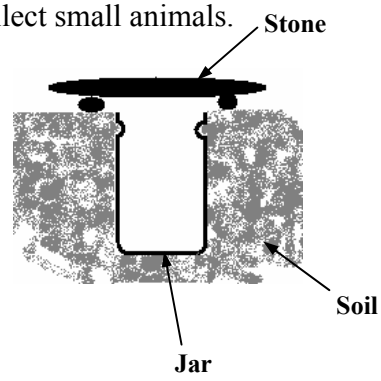
Name **two** things that a plant needs for photosynthesis.

1 _____

2 _____ (6)

Question 10

(a) The diagram shows a piece of **apparatus** used in **ecology** to collect small animals.



Name the piece of apparatus.

_____ (3)

Why is there a **lid** on the piece of apparatus?

_____ (3)

Name **two** animals you might collect in this apparatus.

1 _____

2 _____ (6)

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

Name two **particles** found in soil.

1 _____ 2 _____ (6)

Name one **organism** that is found in soil. _____ (3)

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, an experiment to show **that seeds need moisture to germinate**. (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) Choose a **word** from the list on the right to **complete** each of the sentences below.

LIGHT
STARS
YEAR
SATELLITE

Our **galaxy**, the Milky Way, contains about 100,000 _____. (3)

A body in **orbit** around a planet is called a _____. (3)

The time taken for the **Earth** to orbit the **Sun** is a _____. (3)

Large amounts of _____ **energy** are produced by the Sun. (3)

(b) The diagram shows an instrument used in **weather recording**.

Name the instrument. _____ (3)

What does this **instrument measure**?

_____ (3)

A **barometer** is used to measure _____. (3)

Name **one** other instrument you would use in weather recording.

_____. (3)

(c) Describe, with the aid of a labelled diagram, an experiment to show **how you would measure the effect of wind on the rate of evaporation of water**. (12)

_____

_____

_____

_____

_____

_____

_____

_____

Labelled diagram

Question 12 - Horticulture

(a) What is **germination**?

_____ (3)

Name **two** requirements, other than heat, needed for all seeds to germinate.

1 _____ 2 _____ (6)

Why do plants need light to **grow**?

_____ (3)

(b)

What is **compost**? _____ (3)

Give one **advantage** of using a compost rather than soil.

_____ (3)

What is **hydroponics**?

_____ (6)

(c) Describe, with the aid of a labelled diagram, an experiment to show **how you would measure the air content of a soil or compost**. (12)

_____

_____

_____

_____

_____

_____

_____

_____

Labelled diagram

SECTION E

Question 13 - Materials Science

(a) Match a **substance** from the list on the right with each of the following materials:

Hydrocarbon _____ (3)

Natural textile _____ (3)

Timber _____ (3)

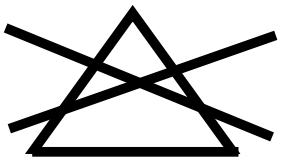
Synthetic textile _____ (3)

COTTON
OAK
NYLON
PETROL

(b) **Care label symbols** are displayed on garments to give information about their care.

What is meant by each of the **care label symbols** shown?

_____ (3)



_____ (3)

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

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

SECTION E

A - PLASTICS

(i) Name a **plastic** found in the home. _____ (3)

(ii) Most plastics are **made** from _____. (3)

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

_____

_____

_____

_____

_____

_____

_____

_____

Labelled diagram

B - TEXTILES

(i) Choose the correct **term** from the list on the right to complete each of the sentences below.

Fibres are used to make yarn using this **procedure**. _____ (3)

Give one **way** that fabrics are made from yarn. _____ (3)

WEAVING

SPINNING

(ii) 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) Name **one** metal that is found **free in nature**. _____ (3)

(ii) Name **one** metal that is found as an **ore**. _____ (3)

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

_____

_____

_____

_____

_____

_____

_____

_____

Labelled diagram

D - TIMBER

(i) Name a **hardwood** tree. _____ (3)

Give one **use** for the hardwood you have named.

_____ (3)

(ii) Describe, with the aid of a labelled diagram, an experiment to **show that grain direction affects the bending strength of timber**. (12)

_____

_____

_____

_____

_____

_____

_____

_____

Labelled diagram

SECTION E

Question 14 - Food

(a) In each case, choose a **food** from the list on the right that is needed by the body for

strong bones _____ (3)

energy _____ (3)

vitamin C _____ (3)

muscle building _____ (3)

LEAN MEAT
SUGAR
CALCIUM
ORANGE JUICE

(b) **Fat**, **fibre** and **reducing sugars** are important in a balanced diet.

Name a **chemical** used to test food for reducing sugars. _____ (3)

How would you **test** for the presence of fat in a sample of food?

_____ (3)

Give one reason why **fibre** is important in a balanced diet.

_____ (3)

Give one reason why a **balanced diet** is important.

_____ (3)

(c) Describe, with the aid of a labelled diagram, a laboratory experiment to **make yoghurt**. (12)

_____

_____

_____

_____

_____

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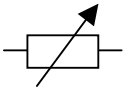
_____

Labelled diagram

SECTION E

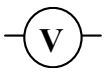
Question 15 - Electronics

(a) Match the correct **electrical component** from the list on the right with each of the following **symbols**.

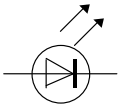


_____ (3)

_____ (3)



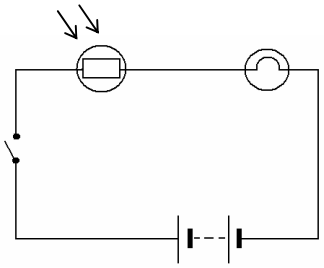
_____ (3)



_____ (3)

VARIABLE RESISTOR
LED
AMMETER
VOLTMETER

(b) The diagram shows an **LDR** connected in a simple circuit.



An **LDR** is a Light_____ Resistor. (3)

The **resistance** of an LDR **increases** in

_____light. (3)

The **resistance** of an LDR **decreases** in

_____light. (3)

Give one everyday **use** of an LDR.

_____ (3)

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

Circuit diagram

SECTION E

Question 16 - Energy Conversions

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

Choose a **conversion** from the list on the right to say what **energy conversion** takes place in

an electric kettle _____(3)

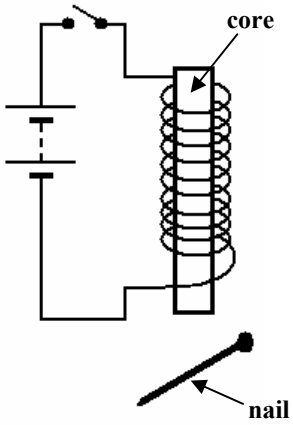
a dropping ball _____(3)

a battery _____(3)

burning coal _____(3)

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

(b) The diagram shows the parts of a simple **electromagnet**.



What **metal** is used to make the core?

_____ (3)

Is an electromagnet a **temporary** or **permanent** magnet?

_____ (3)

What happens to the **nail** when the switch is closed?

_____ (3)

Give **one** everyday **use** of an electromagnet.

_____ (3)

(c) Describe, with the aid of a labelled diagram, a laboratory experiment to **show that energy can be released from food e.g. peanuts**. (12)

Labelled diagram

_____

_____

_____

_____

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_____

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_____

EXTRA WORKSPACE

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

EXTRA WORKSPACE

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