

WARNING
 You must return this paper with your answer-book, otherwise marks will be lost

EXAMINATION NUMBER

--

AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA
JUNIOR CERTIFICATE EXAMINATION, 1999

SCIENCE – ORDINARY LEVEL
 (N.B. Not for Science – Local Studies Candidates)

TUESDAY, JUNE 15 – AFTERNOON, 2.00 – 4.30

SECTION A TO BE ANSWERED BY ALL CANDIDATES.
 (Sections B, C, D and E are on separate sheets).
 Answer the questions in the spaces provided.

SECTION A – CORE (144 MARKS)

Answer any 12 parts (a), (b), (c), etc, from this Section.
 Return this Section of the examination paper in your answer-book.

1. (a) Draw a simple diagram of each piece of apparatus named below.

<u>BEAKER</u>	<u>CONICAL FLASK</u>	<u>TRIPOD STAND</u>	<u>FUNNEL</u>

- (b) Match each of the terms below with an example from the list on the right.

PLANET

STAR

GALAXY

SUN
EARTH
MILKY WAY
JUPITER

Choose the UNIT from the list below which is used to measure DISTANCE in the UNIVERSE.

METRE KILOMETRE LIGHT YEAR

.....

(c) Complete the sentences below using words from the table on the right.

A potato contains energy.

A moving bullet has energy.

A stretched elastic band has energy.

A red hot piece of iron gives out energy.

CHEMICAL
ELECTRICAL
POTENTIAL
LIGHT
KINETIC

(d) What is meant by the term INSULATOR?

.....

Choose **two** insulators from the list below.

COPPER PLASTIC CORK IRON

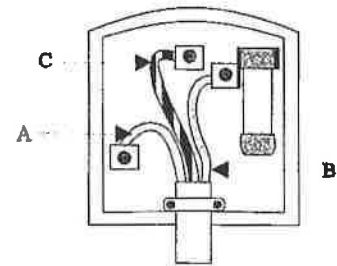
..... and

(e) The diagram shows the inside of an electric plug. Name the WIRES labelled A, B and C.

A

B

C



What is the standard colour of the wire labelled C?

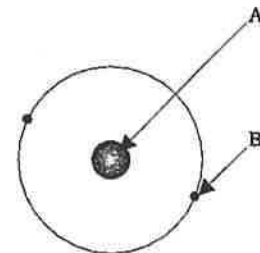
(f) The diagram on the right shows the structure of an ATOM.

What is an ATOM?

.....

Name the parts of the atom labelled A and B.

A B



(g) Match each word on the left with an example from the list on the right.

SOLVENT

COMPOUND

MIXTURE

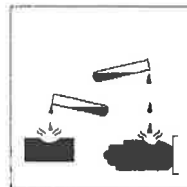
SOLUTION

SALT
WATER
SALT WATER
SUGAR

(h) Bottles which are kept in the laboratory often carry symbols to warn people about dangerous chemicals.

Name a SUBSTANCE which would carry symbol A.

.....



A



B

What does symbol B tell you?

.....

Complete the sentences by using words from the list below.

FREEZING MELTING CONDENSATION EVAPORATION

A liquid changes to a gas by a process called

A gas changes to a liquid by a process called

(i) In order to have clean drinking water it has to be treated. Choose a word from the list below to answer each of the following questions.

FILTRATION SCREENING ALUM FLUORIDE CHLORINE

What stage of the treatment removes floating rubbish from the water?

.....

What is added to the water to kill bacteria?

.....

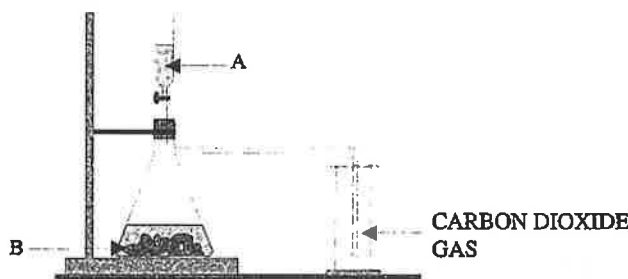
What is added to the water to prevent tooth decay?

.....

Which stage involves passing the water down through a bed of sand and stones?

.....

(j) The apparatus for the preparation of carbon dioxide is shown in the diagram.



What is the liquid A?

What is the solid B?

Carbon dioxide turns milky.

Carbon dioxide is than air.

(k) Choose a substance from the list on the right that comes from

ANIMALS

PLANTS

COTTON
PLASTIC
SILK
NYLON

Give **one** reason why animals move from place to place in a habitat.

.....

(l) The diagram on the right shows a tooth.

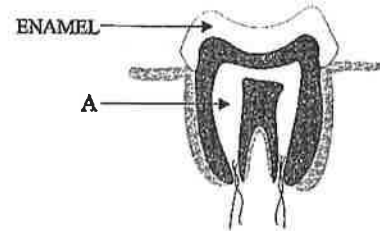
Name the part labelled A.

What is PLAQUE on teeth?

.....

What would you use to show up the plaque on your teeth?

.....



(m) The diagram shows a flowering plant. Name the parts labelled A and B.

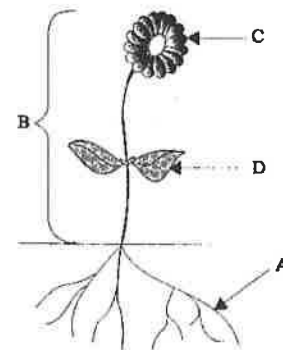
A

B

What is produced by each of the following parts?

C

D



(n) Micro-organisms such as FUNGI, BACTERIA and VIRUSES can be **beneficial** or **harmful**.

Fungi can be used beneficially in

Bacteria can be used beneficially in

Viruses can be used beneficially in

Name a **DISEASE** caused by a **virus**

(o) Name a food which is a good source of

STARCH

PROTEIN

CALCIUM

VITAMIN C

AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

JUNIOR CERTIFICATE EXAMINATION, 1999

SCIENCE – ORDINARY LEVEL
(N.B. Not for Science – Local Studies Candidates)

TUESDAY, JUNE 15 – AFTERNOON 2.00 – 4.30

Section A is on a separate sheet which provides spaces for your answers.
The completed sheet should be enclosed in your answer-book.

SECTIONS B, C, D, E

The questions from these sections should be answered in your answer-book.

Choose any three sections from B, C, D, E.
Answer two questions from each chosen section. All questions carry equal marks.

SECTION B – PHYSICS (72 marks)

Answer any two questions.

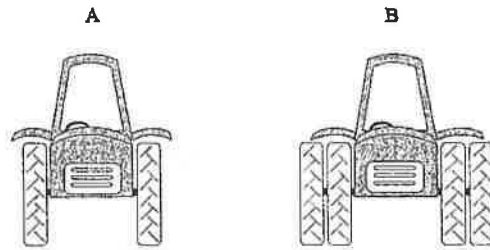
2. (a) Choose a term from the list on the right which

- (i) is the amount of matter in a body (3)
- (ii) is measured in g/cm^3 (3)
- (iii) is equal to $\frac{\text{distance}}{\text{time}}$ (3)
- (iv) can be measured using an opisometer. (3)

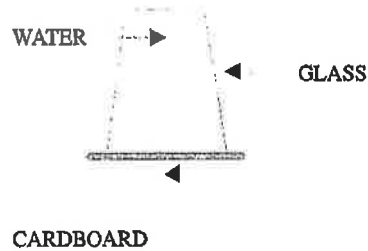
PRESSURE
DENSITY
SPEED
LENGTH
MASS

- (b) Describe, with the aid of a labelled diagram, an experiment you would carry out to find the volume of a stone. (12)
- (c) A force is a push or a pull. It can cause a body to change its speed or its direction or its shape.
- (i) Give an example of a force causing a body to change its shape. (6)
- (ii) What happens to the weight of a body as it moves from Earth to outer space? (3)
- (iii) Name the FORCE that pulls objects towards the centre of the Earth. (3)

3. (a) (i) Explain why tractor **B** would work better than tractor **A** on a bog or on soft ground. (6)
- (ii) Why is it easier to cut bread with the sharp edge than with the blunt edge of a knife? (6)



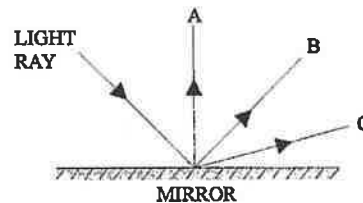
- (b) A glass was filled with water, a card was placed tightly over the top and the glass was then turned upside down.



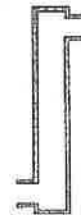
- (i) Why does the water not pour out of the glass when it is turned upside down? (9)
- (ii) If the glass were only half-filled with water, what would happen when the glass is turned upside down? (3)
- (c) Describe, with the aid of a labelled diagram, an experiment you would carry out to show that **liquids expand when heated**. (12)

4. (a) Look at the diagram on the right which shows a light ray hitting a mirror.

- (i) Which of the rays **A**, **B** or **C** is the reflection of the light ray which hit the mirror? (3)



- (ii) You are given the tube on the right and two small mirrors. Copy the diagram into your answer-book and show on it where you would place the mirrors in the tube so that it can be used as a **PERISCOPE**. (6)

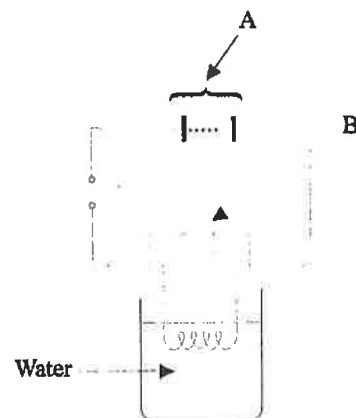


- (iii) Give **one use** for a periscope. (3)

- (b) Describe, with the aid of a labelled diagram, an experiment you would carry out to show that **light travels in straight lines**. (12)

- (c) The diagram on the right shows a simple electrical circuit.

- (i) Name the part of the circuit labelled **A**. (3)
- (ii) Name the part of the circuit labelled **B**. (3)
- (iii) What happens to the water in the beaker when the switch is closed? (6)



SECTION C – CHEMISTRY (72 marks)

Answer any two questions.

5. (a) The experiment on the right was set up to measure the melting point of ice.

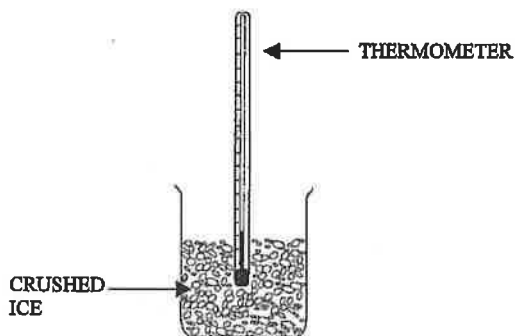
(i) What is the MELTING POINT of ice in °C? (3)

(ii) What is the BOILING POINT of water in °C? (3)

(iii) Copy and complete the word equation in your answer-book.

Hydrogen + _____ → Water (3)

(iv) Name a liquid which is used in a thermometer. (3)



(b) You are given THREE WATER SAMPLES, some SOAP FLAKES and THREE GRADUATED CYLINDERS.

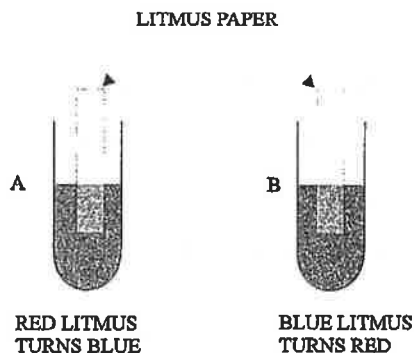
Describe an experiment you would carry out to compare the hardness of the water samples. (12)

(c) The liquids in test tubes A and B were tested with litmus paper as shown.

(i) What kind of substance was present in A? (3)

(ii) What kind of substance was present in B? (3)

(iii) How would you measure the pH of a liquid? (6)

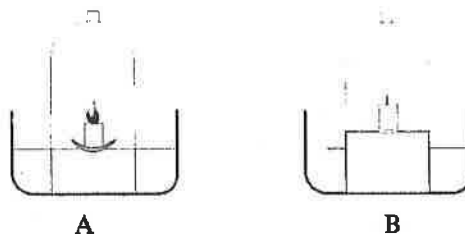


6. (a) (i) Name the FAMILY of elements shown on the right. (3)
- (ii) What is an ELEMENT? (3)
- (iii) Copy and complete the word equation below in your answer book. (3)
- Sodium + Chlorine \longrightarrow _____ (3)

1
Li
Na
K
Rb

- (b) A lighting candle was placed under a bell jar in a basin of water as shown in diagram A. After a short while the candle quenched and the level of the water inside the bell jar rose up as in diagram B.

- (i) Why did the candle quench after a short time? (6)
- (ii) Why did the water level inside the bell jar rise? (3)
- (iii) What does the experiment show? (3)



- (c) Describe, with the aid of a diagram, an experiment you would carry out to separate sand from water. (12)

7. (a) Burning fuel is a chemical reaction.

- (i) What is meant by a CHEMICAL REACTION? (6)
- (ii) What is the general name for fuels that come from dead plants and animals? (3)
- (iii) Name one fuel. (3)

- (b) The fire triangle on the right is used to show the three things that a fire needs in order to burn.

- (i) Name the two things that are represented by A and by B. (6)
- (ii) What type of fire extinguisher would you use to put out a fire in an electric cooker? (3)
- (iii) State one fire safety precaution you could take in your home. (3)

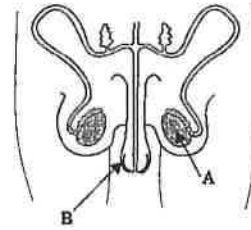


- (c) Draw a labelled diagram of an experiment you would set up to produce and collect oxygen. (12)

SECTION D – BIOLOGY (72 marks)

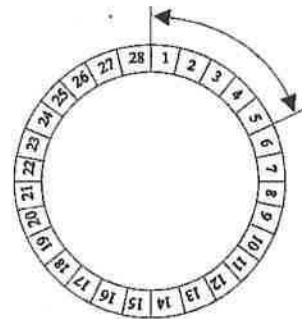
Answer any two questions.

8. (a) The diagram on the right shows the male reproductive system.



- (i) Name the part labelled A. (3)
- (ii) Name the part labelled B. (3)
- (iii) What is meant by FERTILISATION? (6)

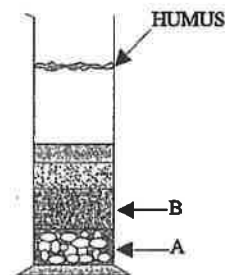
- (b) The diagram shows the 28 days of the menstrual cycle.



- (i) On which day of the cycle is the egg released? (3)
- (ii) What happens between days 1–5 of the cycle? (6)
- (iii) Name one method of FAMILY PLANNING. (3)

- (c) Describe an experiment you would carry out to show that seeds need a suitable temperature to germinate. (12)

9. (a) Some soil and water were mixed and shaken in a graduated cylinder and allowed to settle. The result is shown in the diagram on the right.



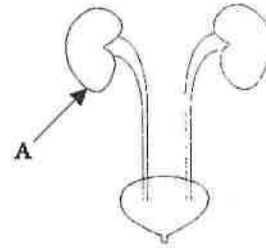
- (i) Which part of the soil is found at A? (3)
- (ii) Which part of the soil is found at B? (3)
- (iii) Where does the HUMUS in the soil come from? (3)

- (b) Describe an experiment you would carry out to show that soil contains water. (12)

- (c) (i) Name a HABITAT you have studied. (3)
- (ii) Give one example to show how animals compete with one another. (6)
- (iii) Write out a FOOD CHAIN from a habitat you have studied. (6)

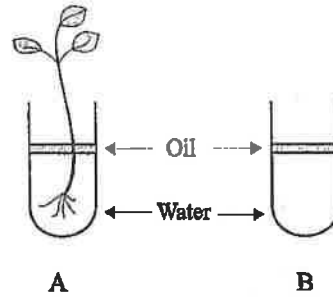
10. (a) The human body produces wastes which are removed by excretion.

- (i) Name the organ of excretion labelled A in the diagram and a waste product excreted by it. (6)
- (ii) Name another organ of excretion and a waste product excreted by it. (6)



(b) The experiment on the right was set up and left in a bright warm room for a few days.

- (i) Why was the oil put into the test tubes? (6)
- (ii) Why would the water level go down in tube A and not in tube B? (6)



(c) Describe, with the aid of a labelled diagram, an experiment you would carry out to show that oxygen is produced during photosynthesis. (12)

76

SECTION E – APPLIED SCIENCE (72 marks)

Answer any two questions.

11. EARTH SCIENCE

(a) Match each phrase below with the correct term from the list on the right.

- (i) The length of time the Earth takes to complete **one full rotation on its axis.** (3)
- (ii) The length of time it takes the Earth to make **one complete orbit around the Sun.** (3)
- (iii) This happens when the Moon is in a straight line between the Earth and the Sun. (3)
- (iv) A body in **orbit around a planet.** (3)

ECLIPSE OF THE SUN
DAY
SATELLITE
YEAR
ECLIPSE OF THE MOON

- (b) Describe an experiment you would carry out to **show the effects of temperature on evaporation.** (12)
- (c)
 - (i) Explain how you would use a **RAIN GAUGE.** (6)
 - (ii) What is used to measure the **PRESSURE** of the atmosphere? (3)
 - (iii) What is measured with an **ANEMOMETER?** (3)

12. HORTICULTURE

- (a) Flower sellers have to make sure that cut flowers stay fresh for as long as possible.
 - (i) What is the **best time of the day** for harvesting the flowers? (3)
 - (ii) Why is a **bleach** often added to the water in a flower vase? (3)
 - (iii) Describe **one way** that the flower seller could **reduce the amount of water lost** by the flowers. (6)
- (b) You are given 100 seeds. Describe an experiment you would carry out to find the **percentage germination of the seeds.** (12)
- (c) Plants can be destroyed by diseases and pests.
 - (i) Name **one common garden PEST.** (6)
 - (ii) State **one way** by which the pest damages a named plant. (6)

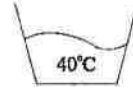
13. MATERIALS SCIENCE

(a) Name a **SYNTHETIC** material that would be suitable for making:

- (i) a school shirt. (3)
- (ii) a bucket. (3)
- (iii) a rope. (3)

(b) Care labels carry symbols which tell us how to look after our clothes.

- (i) Explain what the **SYMBOL** on the right means. (3)
- (ii) Draw the symbol which means **DO NOT BLEACH** in your answer-book. (3)
- (iii) Draw the symbol which means **COOL IRON** in your answer-book. (3)



(c) Answer any one of the following sections **A, B, C** or **D**.

A. PLASTICS

- (i) Give one use for polystyrene. (3)
- (ii) Give one use for PVC. (3)
- (iii) Describe, with the aid of a labelled diagram, an experiment you would carry out to compare the flexibility of two plastics. (12)

OR

B. TEXTILES

- (i) Choose **two** natural fibres from the list on the right. (6)
- (ii) Describe an experiment you would carry out to compare the resistance to wear of two fabrics. (12)

RAYON
WOOL
COTTON
ACRYLIC

OR

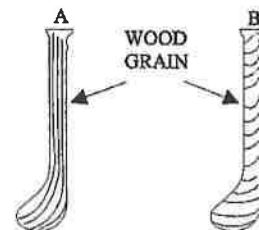
C. METALS

- (i) What is an **ALLOY**? (6)
- (ii) Describe how you would extract a named metal from its ore. (12)

OR

D. TIMBER

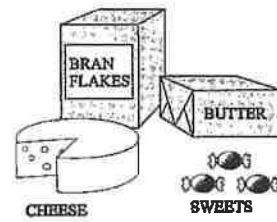
- (i) Which of the two hurleys on the right would be the stronger? (3)
- (ii) Name a **HARDWOOD**. (3)
- (iii) Describe, with the aid of a labelled diagram, how you would carry out an experiment to compare the bending strengths of two timbers. (12)



14. **FOOD**

(a) Choose a food from those shown on the right which

- (i) is needed in the body for **GROWTH**. (3)
- (ii) is needed in the body for **ENERGY**. (3)
- (iii) contains a large amount of **FAT**. (3)
- (iv) could help prevent **CONSTIPATION**. (3)



(b) Food additives are used in the food industry.

- (i) State **two** advantages of food additives. (6)
- (ii) State **one** disadvantage of food additives. (3)
- (iii) What type of food additive is E104? (3)

(c) You are given a container of pasteurised milk. Describe how you would use it **to make yoghurt**. (12)

15. ELECTRONICS

(a) Switches can be wired in a circuit in series or in parallel. Examine the circuits A, B and C shown below.



circuit A



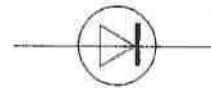
circuit B



circuit C

- (i) Which of the circuits A, B or C shows the switches in PARALLEL? (3)
 - (ii) Which of the circuits A, B or C shows the switches in SERIES? (3)
 - (iii) Which of the circuits A, B or C shows a TWO-WAY SWITCH? (3)
 - (iv) Which of the circuits A, B or C would be suitable for a STAIRS or HALLWAY? (3)
- (b) (i) Name the device shown on the right. (3)

- (ii) Draw a simple circuit showing a battery, a bulb and the device shown on the right wired in such a way that the bulb will light. (9)



- (c) (i) Draw the symbol for a light-emitting diode (LED). (3)
- (ii) Give two uses for LEDs. (6)
- (iii) In electronic circuits a resistor is usually placed in series with an LED. What is the function of the RESISTOR? (3)

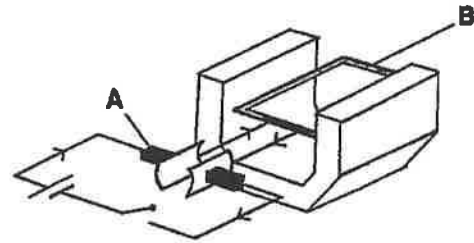
16. ENERGY CONVERSIONS

(a) Use the conversions listed on the right to say what energy conversion takes place

- (i) when a drum is beaten (3)
- (ii) when coal is burned in a fire (3)
- (iii) when a plant makes food (3)
- (iv) when a battery is used to make a bulb light. (3)

CHEMICAL TO LIGHT
LIGHT TO CHEMICAL
KINETIC TO SOUND
CHEMICAL TO HEAT

- (b) (i) Name the device shown in the diagram. (3)
- (ii) Name the part A. (3)
- (iii) What happens to the part B when the electric current flows? (3)
- (iv) Name a piece of equipment in the home which uses this type of device. (3)



(c) Describe, with the aid of a labelled diagram, an experiment you would carry out to show that heat is given out when food is burned. (12)