WARNING

You must return this paper with your answerbook, otherwise marks will be lost.

EXAMINATION NUMBER

AN ROINN OIDEACHAIS
JUNIOR CERTIFICATE EXAMINATION, 1993

SCIENCE - ORDINARY LEVEL

TUESDAY, JUNE 15 - Afternoon 2.00 - 4.30 p.m.

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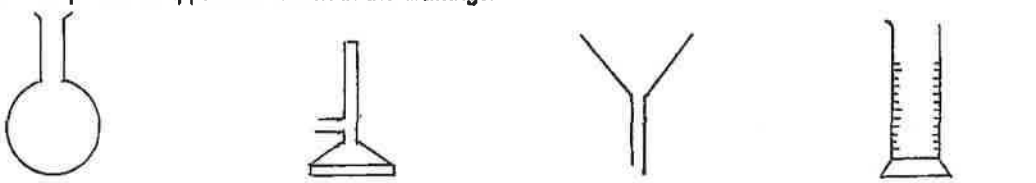
SECTION A TO BE ANSWERED BY ALL CANDIDATES.
Sections B, C, D, E are on separate sheets.
Answer the questions in the spaces provided.

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)** Name the pieces of apparatus shown in the drawings:

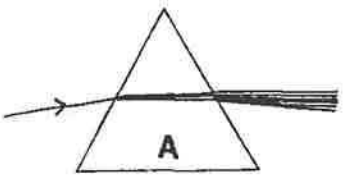


_____ _____ _____ _____

(b) The drawing shows a ray of white light passing through a piece of glass A.

What is **A** called ? _____

What effect does **A** have on the beam of light ? _____



Name the primary light colours _____

_____

(c) Heat is transferred by:
CONDUCTION CONVECTION or RADIATION

In which way is heat transferred in a liquid ?

_____

In which way is heat carried from the Sun to the Earth ?

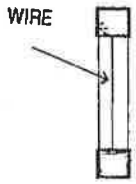
_____

Name one method used to prevent heat loss in our homes.

_____

OVER->

(d) The WATT is a unit used in electricity.
What does the watt measure ? _____



The drawing shows a 5 A fuse.
What happens if the current going through the fuse is more than 5 amperes ? _____

_____

An electric fire uses two units of electricity every hour. Electricity costs 8 p per unit. How much does it cost to use the fire for 5 hours ? _____

(e) The universe is made of many galaxies.
What is the name of the galaxy to which the Earth belongs ?

_____

What is the *solar system* ? _____

_____

How long does it take the Earth to orbit the Sun ?

_____

(f) Bottles in the laboratory may carry warning (hazard) symbols.
What does the symbol shown tell you ?

_____

_____

Choose words from the following
MELTING FREEZING EVAPORATION CONDENSATION
to describe the changes in (i) and (ii) below:

(i) Liquid ⟶ Solid

_____

(ii) Gas ⟶ Liquid

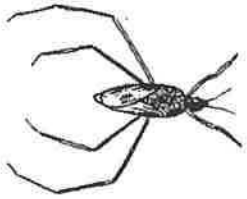
_____

(g) What is a compound ?

_____

_____

The drawing shows an insect (pond skater) which can walk on water. What property of water allows an insect to walk on water ?

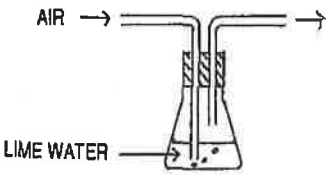


_____

(h) Name the gas which makes up about 20% of the air.

_____

Air was sucked through the flask as shown. The lime water turned milky. What does this tell you about air ?



_____

What gas in the air is needed for burning ?_____

A piece of pink cobalt chloride paper was left in air. It turned blue. What does this tell you about air ?

_____

(i) Sand is INSOLUBLE in water. What does the word INSOLUBLE mean ?

_____

_____

Sugar dissolves in the water to form a sugar solution. The water is called a SOLVENT. What does the word SOLVENT mean ?

_____

_____

(j) Atoms are made up of small particles. Name the *three* types of particles.

_____

_____

Which one of these particles is involved in chemical reactions ?

_____

(k) Give two CHARACTERISTICS of living things.

(i) _____

(ii) _____

Give TWO differences between animals and plants.

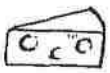
(a) _____

(b) _____

OVER->

(l)

POTATO



CHEESE

APPLE

MILK

BREAD

Choose one food from the drawings above which has a large amount of:

(a) Carbohydrate _____

(b) Calcium _____

What is the function of fat in the human body ?

_____

What is the function of protein in the human body ?

_____

(m) In a habitat there are plants and animals.
Name ONE way in which the animals compete with each other.

_____

_____

Give an example of how animals and plants help each other (co-operate).

_____

_____

(n) Name the organ or part of the human body which does each of the following:

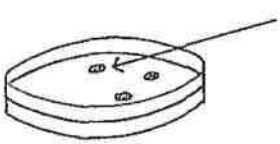
pumps blood around the body. _____

passes oxygen into the body. _____

gives the body its shape and keeps it upright. _____

makes egg cells in the female. _____

(o) Bacteria are examples of micro-organisms.



The diagram shows bacteria growing on a dish.
What substance needs to be added to the dish before bacteria will grow ? _____

Name a disease caused by a virus. _____

Name a microorganism used in the food industry. _____

Name a fungus which we can eat. _____

(12x12)

AN ROINN OIDEACHAIS

S36

JUNIOR CERTIFICATE EXAMINATION, 1993

26299

SCIENCE - ORDINARY LEVEL

(N.B. Not for Science - Local Studies candidates)

TUESDAY, JUNE 15

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)** **(i)** What piece of apparatus would you use to measure the mass of a stone ? **(3)**

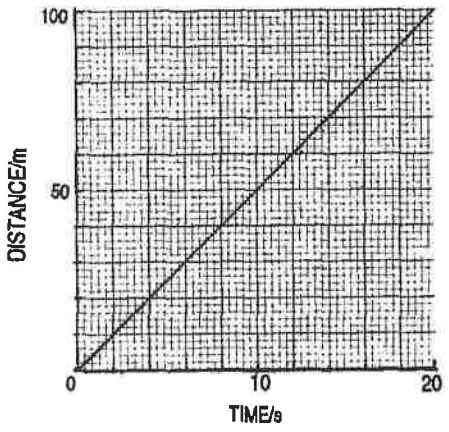
(ii) Describe an experiment you could do to measure the volume of the stone. **(9)**

(iii) If the mass of stone is 75 g and its volume is 25 cm^3, what is the density of the stone ? **(9)**

(b) **(i)** What is *speed* ? **(6)**

(ii) What are the units of speed ? **(3)**

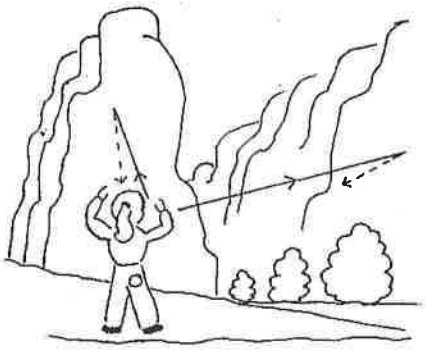
(iii) A cyclist travels 100 metres in 20 seconds as shown on the graph. What is the average speed of the cyclist ? **(6)**



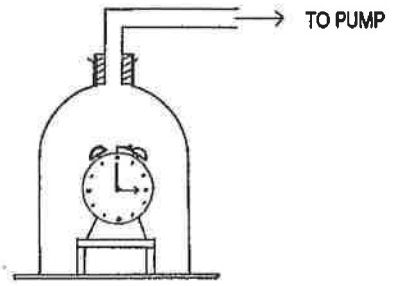
OVER->

3. (a) Sound is a type of energy.

(i) Name *two* other types of energy. (6)

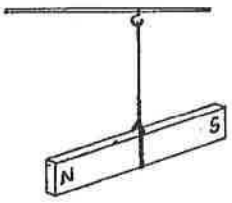


(ii) The person in the drawing shouts loudly and hears an echo. What causes the echo ? (6)



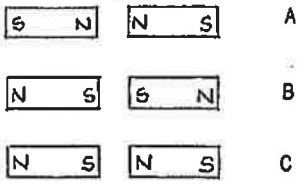
(iii) If air is removed from the belljar, why can the alarm clock not be heard when it rings ? (6)

(b) The magnet shown in the drawing is swinging freely.



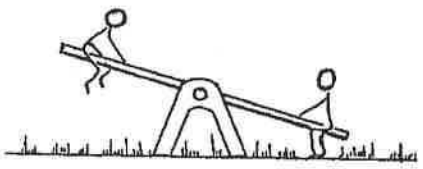
(i) In what direction will the north pole point when it comes to rest ? (6)

(ii) Magnets are put in pairs as shown in the drawing. In which of the pairs **A**, **B** or **C**, will the magnets be attracted to each other. (3)



(iii) Describe a simple experiment to show the field of a magnet. (9)

4. (a) The diagram shows an example of a LEVER.



(i) What is a LEVER ? (6)

(ii) Give two more everyday examples of levers. (6)

(b) (i) What is a *force* ? (6)

(ii) Give an example where friction is useful. (3)

(iii) Give an example where friction is not useful. (3)

(iv) Give a way of reducing friction. (3)

(c) Describe a simple experiment to show that air has pressure. (9)

SECTION C CHEMISTRY (72 marks)

Answer any <u>two</u> questions.

5. **(a)** **(i)** What is an *element* ? **(6)**

(ii) Name the elements which have the symbols:

Na **Fe** **(6)**

(iii) The periodic table arranges the elements in groups. **Group 7** is shown in the drawing. Why are these elements put in the same group ? **(6)**

9 F 19.00
17 Cl 35.457
35 Br 79.916
53 I 126.92

(b) **(i)** Write down a word equation for the reaction between hydrochloric acid and calcium carbonate. **(6)**

(ii) Write a word equation for the reaction of magnesium and oxygen. **(6)**

(iii) During a chemical reaction an ATOM can be changed into an ION ?
What is an ION ? **(6)**

6. **(a)** **(i)** Name *two* everyday metals. **(6)**

(ii) Give *one* use for *each* of the metals you have named. **(6)**

(iii) Metals are MALLEABLE and DUCTILE
Explain what ONE of these words mean. **(6)**

(b) Metals are conductors of heat.
Describe a simple experiment to show that a metal is a good conductor of heat. **(9)**

(c) Sometimes we use metals in the form of an ALLOY.
What is an alloy ? Name an alloy. **(9)**

OVER->

7. (a) An INDICATOR is a chemical which changes colour when it is put into an acid or base.

(i) Name an indicator you have used in the laboratory. (3)

(ii) Describe a simple experiment to obtain an indicator from red cabbage. (9)

(b) The pH scale is used to compare the strength of acids and bases. Here is a list of liquids with their pH values:

LIQUID	A	B	C	D	E
pH	1	5	7	9	12

(i) Which liquid is the strongest acid ? (3)

(ii) Which liquid is the strongest base ? (3)

(iii) Which liquid is neutral ? (3)

(iv) What would you use to measure the pH of a liquid ? (3)

(c) (i) The drawing shows dilute hydrochloric acid reacting with the metal magnesium. The gas given off burns with a pop.

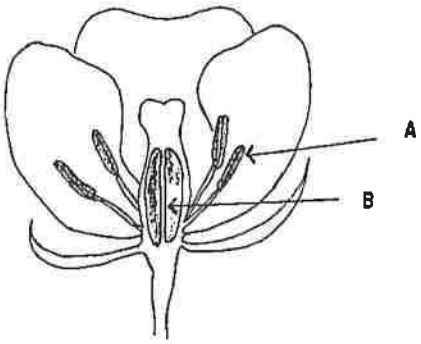
What is the name of the gas ? (6)

(ii) Acids can dissolve in rain to form acid rain. Give TWO harmful effects of acid rain. (6)

SECTION D BIOLOGY (72 marks)

Answer any <u>two</u> questions

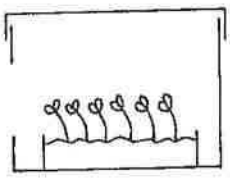
8. **(a)** **(i)** Name parts **A** and **B** of the flower shown in the diagram. **(6)**



(ii) What is the function of part **A** ? **(6)**

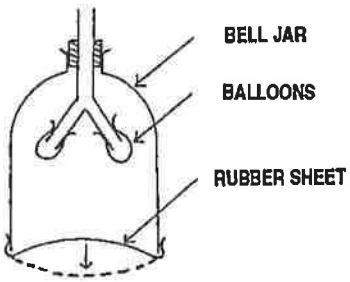
(iii) What is the function of part **B** ? **(6)**

(b) Seeds were put on damp cotton wool in a box which had an opening on one side.
The seedlings grew towards the light as shown in diagram.
What is the name given to this response ? **(6)**



(c) Describe a simple experiment to show the movement of water in a plant. **(12)**

9. **(a)** The drawing shows a model of the breathing system in humans.

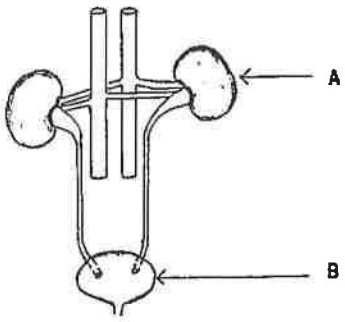


(i) What do the balloons represent (stand for) ? **(3)**

(ii) What does the rubber represent (stand for) ? **(3)**

(iii) What happens when the rubber sheet is pulled down ? **(6)**

(b) **(i)** Explain what the word EXCRETION means. **(6)**



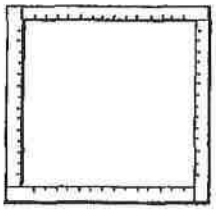
(ii) The drawing shows one of the excretory systems in humans.
Name the parts marked **A** and **B**. **(6)**

(c) **(i)** Name *one* mineral which makes bones hard. **(3)**

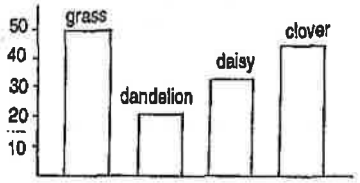
(ii) Describe a simple experiment to show what happens to bones when the mineral you have named in (i) is taken out. **(9)**

OVER->

10. (a) (i) The drawing shows a piece of apparatus which is used to investigate the number of different plants in a habitat.
Name the apparatus. **(6)**



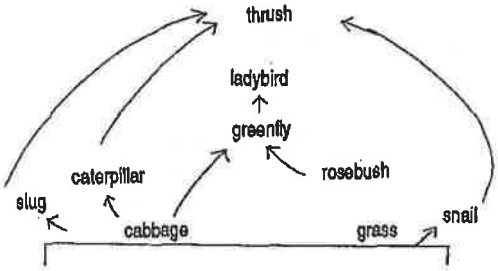
(ii) The drawing shows the result of a survey of plants growing in a habitat.



Which type of plant occurred most often ? **(3)**

Which type of plant occurred least often ? **(3)**

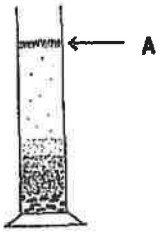
(b) Some living things are PRODUCERS and some are CONSUMERS.



(i) Name TWO consumers shown in the diagram. **(6)**

(ii) What is a PRODUCER ? **(6)**

(c) (i) The drawing shows some soil which has been shaken up with water and allowed to stand.



Name the part which is found at **A**. **(3)**

(ii) Describe a simple experiment to find the mass of water in a sample of soil. **(9)**

SECTION E APPLIED SCIENCE

Answer any two questions

11. EARTH SCIENCE

(a) (i) Name ONE planet (other than Earth) which orbits the Sun. **(3)**

(ii) Distances to stars are often measured in light years. What is a light year ? **(6)**

(iii) Explain how an *eclipse of the sun* occurs. **(9)**

(b) In the water cycle, water evaporates all the time from the surface of Earth. Describe a simple experiment to show the effect of temperature on the rate of evaporation. **(12)**

(c) Name two measurements you would take if you were weather recording. **(6)**

12. HORTICULTURE

(a) (i) Name two living organisms you would find in soil. **(6)**

(ii) Explain how ONE of the living organisms you have named in (i) is useful in the soil. **(6)**

(b) Describe how you could take softwood or hardwood cuttings from a plant and make them grow. **(12)**

(c) (i) Describe how you would measure the germination rate of seeds. **(9)**

(ii) What is DORMANCY ? **(3)**

OVER->

13. MATERIAL SCIENCE

(a) Use words from the list below to answer this question.
(Choose FOUR words only)

OAK GLASS POLYTHENE COAL COPPER WOOL

(i) Name a metal.

(ii) Name a textile.

(iii) Name a plastic.

(iv) Name a timber. **(4 x 3)**

(b) (i) Give one use of a plastic in your home. **(3)**

(ii) Give one use of wood in your home. **(3)**

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

A: PLASTICS

(i) Give one advantage and one disadvantage of using plastics. **(6)**

(ii) Describe a simple experiment to compare the hardness of two different plastics. **(12)**

OR

B: TEXTILES

(i) Name two man-made (synthetic) fibres. **(6)**

(ii) Describe a simple experiment to compare the value of two textiles as insulators. **(12)**

OR

C: METALS

(I) Name a metal which is found in a pure state in the ground.
Name a metal which is found as an ore. **(6)**

(II) Describe a simple experiment to compare the reactivity of two metals. **(12)**

OR

D: TIMBER

(I) Name two types of man-made or manufactured timbers. **(6)**

(ii) Describe a simple experiment to compare the bending strength of two pieces of wood. **(12)**

14. FOOD

(a) (i) What chemical would you use to test a piece of bread for starch ? **(3)**

(ii) What effect does this test have on the colour of the bread ? **(3)**

(iii) The information shown in the chart was printed on a packet of breakfast cereal.

100 grams provides:
Protein 6 g
Vitamin A 1.8 mg
Sodium 1.0 g
Iron 6.7 mg
Energy 1650 kJ

How much energy is there in 200 g of the cereal. **(6)**

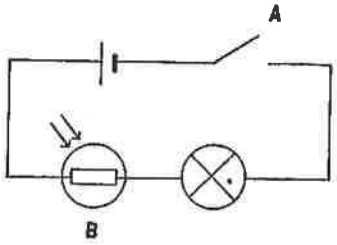
(b) Describe a simple experiment to make silage. **(12)**

(c) (i) Name two methods of food preservation for human use. **(6)**

(ii) Explain why one of the methods you have named preserves food. **(6)**

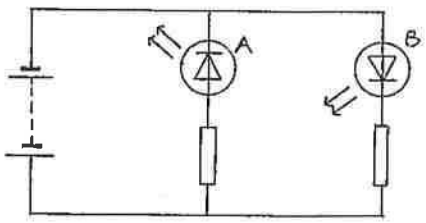
15. ELECTRONICS

(a) (i) Name the parts marked **A** and **B** in the circuit. **(9)**



(ii) Give one example of the use of **B** **(6)**

(b) Study the circuit diagram shown.



(i) Name the device labelled **A**. **(3)**

(ii) Through which of the devices (**A** or **B**) will a current flow ? **(3)**

(iii) Explain why the current flows as you have stated. **(3)**

(c) (i) Draw a simple circuit diagram containing a two-way switch and a device to show when a current is flowing.
Label your diagram. **(9)**

(ii) Draw the symbol for a *variable resistor.* **(3)**

16. ENERGY CONVERSIONS

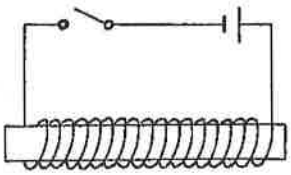
(a) Give an example of each of the following energy conversions:

(i) Potential energy to kinetic energy. **(3)**

(ii) Light energy to electrical energy. **(3)**

(iii) Describe a simple experiment to show that chemical energy can be converted to heat energy. **(6)**

(b) The drawing shows a simple electromagnet.



(i) What is the iron inside the coil called ? **(3)**

(ii) When the switch is closed, there is an electric current flowing. How could you show that a magnet has been formed ? **(6)**

(iii) Give one use of an electromagnet. **(3)**

(iv) Give one advantage of an electromagnet over a permanent magnet. **(3)**

(c) Describe an experiment to investigate the release of stored energy from food. **(9)**