S 37A
EXAMINATION NUMBER

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

Coimisiún na Scrúduithe Stáit
State Examinations Commission

JUNIOR CERTIFICATE EXAMINATION, 2004

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

THURSDAY, 17 JUNE - AFTERNOON, 2.00 to 4.30

SECTION A (144 marks) **TO BE ANSWERED BY ALL CANDIDATES.**
(See separate sheet for **Sections B, C, D and E.**)

Answer *each* of the questions 1, 2 and 3. There are **TEN** parts in each question. Answer any **EIGHT** parts. All questions carry equal marks. Answer the questions in the spaces provided. Return this Section of the examination paper. Enclose it in the answer-book you use in answering the other Sections.

1. Answer **eight** of the following, (*a*), (*b*), (*c*), etc.

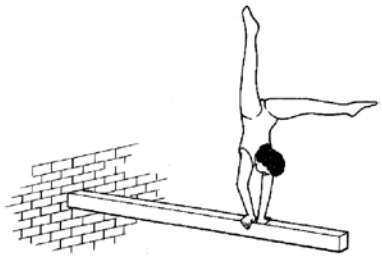
(*a*) The volume of a hundred drops of water from a tap was found to be 20 cm^3. Name an instrument that could be used to measure the volume of the water. What is the volume of one drop of water?

Name of instrument _____

Volume of one drop _____

[Turn over

(*b*) The girl weighs 500 newtons.
She is balancing on a beam 1.5 metres (150 cm) from a wall.
Calculate the moment of the force exerted by the girl on the beam, taking the wall as the fulchrum.



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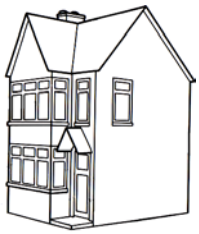
(*c*) Why do bubbles of gas expand as they rise to the surface of a pond?

_____

_____

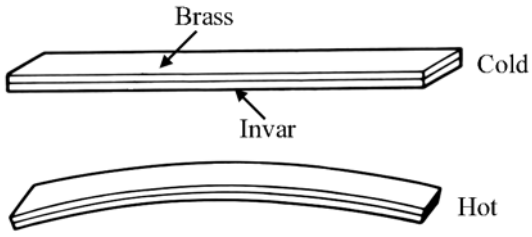
(*d*) Give **two** ways of reducing heat loss from a house.



One _____

Two _____

(*e*) The diagram shows a bimetallic strip. Why does the strip bend when it is heated? Give a use for the bimetallic strip.

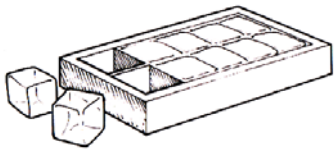


Why? _____

_____

Use _____

(*f*) When ice cubes, at 0 °C, are added to a drink their cooling effect is greater than if the same mass of liquid water at 0 °C were added. Explain why this is the case.

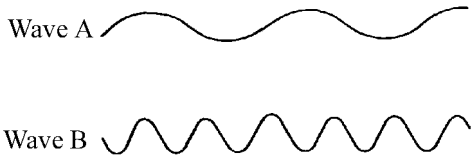


Explanation _____

_____

_____

(*g*) The diagram shows two waves travelling with the same velocity. Which wave has the highest frequency?

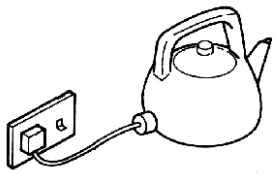


Wave _____

Give a reason for your answer.

Reason _____

(*h*) Why are fuses fitted to the plugs of domestic appliances? Select the *appropriate fuse* for the *kettle* shown given a choice of a 2 A, a 5 A or a 13 A fuse. The domestic electricity supply is 230 volts.



Why? _____

Appropriate fuse for kettle _____

(*i*) How are echoes produced?

_____

_____

(*j*) What type of energy *generates* lightning?

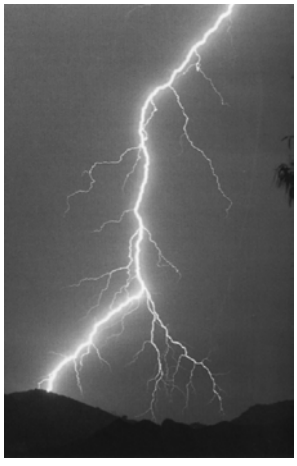
Type of energy _____

Why do we usually see the flash before we hear the thunder?

_____

_____

_____



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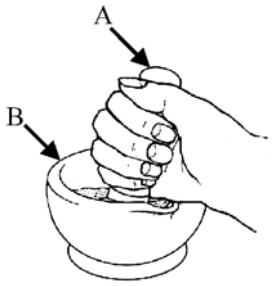
2. Answer **eight** of the following, (*a*), (*b*), (*c*), etc.

(*a*) Name **both** items of laboratory equipment being used in the diagram.



Item **A** _____

Item **B** _____

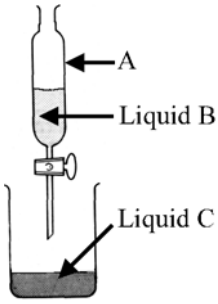
(*b*) What is meant by an *endothermic reaction*?

_____

Give an example of an *endothermic reaction*.

_____

(*c*) Name the piece of equipment labelled **A** in the diagram.



Piece of equipment **A** _____

Immiscible liquids **B** and **C** were originally in **A**.
Suggest what liquid **B** and liquid **C** might be.

Liquids **B** and **C** _____

(*d*) Name a substance that changes colour when it is exposed to water vapour.
Give the colour change that the named substance undergoes.

Name _____

Colour change _____

(*e*) The insect shown in the diagram is a pond skater.
This insect can 'walk on water'. Name the property of water that enables the insect to do this.

Name _____

(*f*) Explain the term *corrosion* when applied to metals.

_____

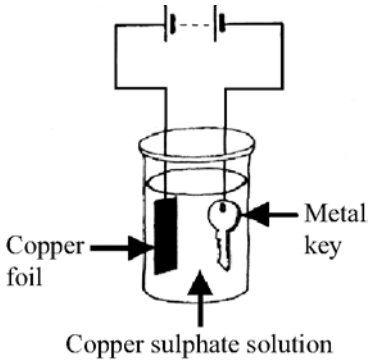
_____

(*g*) Name the process that is taking place in experiment shown in the diagram.

Process _____

What happens to the copper foil in this experiment? _____

_____



(*h*) Give **two** ways in which water is purified before it is piped to our homes.

One_____

Two_____

(*i*) Describe a test that you could carry out to show that a sample of water is *hard*. Give the result of the test.

Test _____

Result_____

(*j*) Burning fossil fuels releases gases into the atmosphere that can damage our planet. Name **one** of these gases and state a damaging effect that it has on our environment.

Gas _____

Damaging effect _____

(8 × 6)

[Turn over

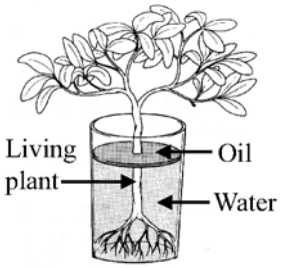
3. Answer **eight** of the following, (*a*), (*b*), (*c*), etc.

(*a*) Give **two** different uses that an animal might make of the energy produced in its cells by respiration.

Use one _____

Use two _____

(*b*) A pupil set up the plant experiment shown in the diagram. What is the function of the oil?
Why does the water level fall as time passes?



Function of oil _____

_____

Reason why water level falls _____

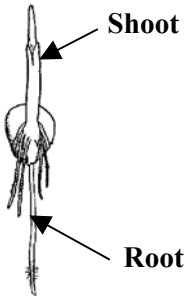
_____

(*c*) Give **one** *adaptation* shown by a named animal to its environment.

Name of animal _____

Adaptation _____

(*d*) The diagram shows a germinating maize seed. Why does the shoot of the seed grow up while its root grows down?



Why? _____

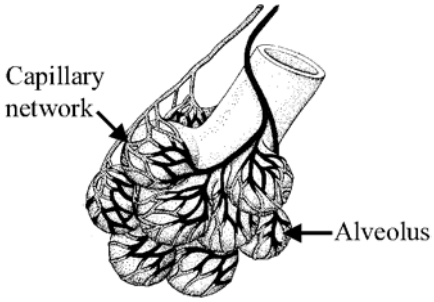
_____

(*e*) Name **two** types of transport tissue found in plants.

Tissue one _____

Tissue two _____

(*f*) What organ, in our body, contains large numbers of the item shown in the diagram? Give **one** change that occurs in blood as it moves through the capillary network shown.



Organ _____

Change _____

_____

(*g*) What role does *humus* play in soil? Explain the term '*leaching*' when applied to soil.

Role of humus _____

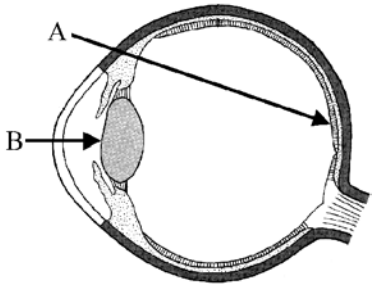
Leaching _____

(*h*) Name the layer of cells labelled **A**.

Name of **A** _____

Give the function of **B**.

Function of **B** _____



(*i*) Distinguish between *ligaments* and *tendons*.

Ligaments _____

Tendons _____

(*j*) Show, using an **X**, on the diagram of a carrot where this plant stores most of its food. Name a carbohydrate commonly stored by plants.

Name _____

(8 × 6)

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