2007. S37A

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, 2007

SCIENCE – HIGHER LEVEL

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

THURSDAY, 14 JUNE – MORNING, 09.30 to 12.00

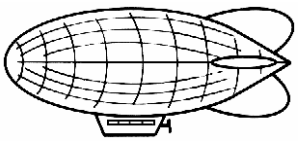
SECTION A (144 marks) **TO BE ANSWERED BY ALL CANDIDATES.**

(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*) What *condition/s* must be satisfied for a balloon to *float* in air?



_____

_____

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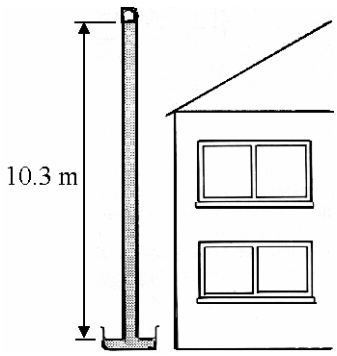
(*b*) Atmospheric pressure can support, on average, a column of water 10.3 m high.
Give **one** *reason* why a water barometer might not be a practical instrument to measure atmospheric pressure. Name an *alternative instrument* to measure atmospheric pressure.



Reason _____

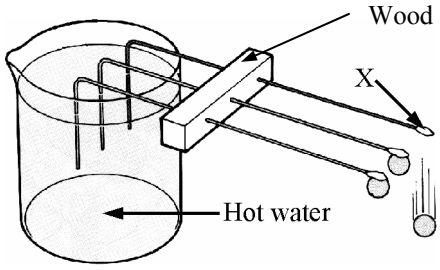
Alternative _____

(*c*) Distinguish between *speed* and *velocity*.

_____

_____

(*d*) The rods, shown in the diagram, are made of three different metals. Steel ball bearings are attached to the rods with a *substance* 'X'. Name a *suitable* substance 'X'.



X _____

What *property* of the rods is being compared in this experiment?

Property _____

(*e*) Give **two** ways in which the clinical mercury-in-glass thermometer is *designed* to fulfil its purpose.

1 _____

2 _____

(*f*) The photo shows a nuclear power plant. Water vapour is released from the cooling towers. Give **one** *advantage* and **one** *disadvantage* of using nuclear energy to generate electricity.

Advantage _____

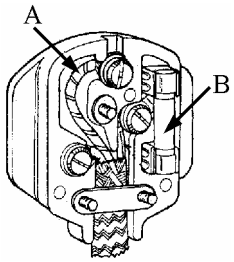
Disadvantage _____

(*g*) Calculate the *total resistance* of the pair of resistors, in series, shown in the diagram.

_____

Draw a *diagram* of the same pair of resistors in *parallel* in the box opposite.

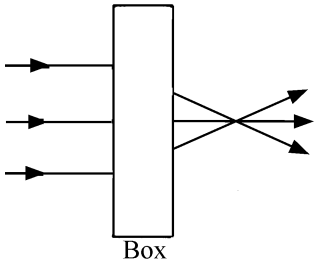
(*h*) The diagram shows a 13 A plug with the cover removed. Name wire A and give the *function* of part B.



Name of A _____

Function of B _____

(*i*) Draw the *shape of a lens* i.e. a cross section of a lens in the box that would cause light rays to converge as shown in the diagram.
Name the *type of lens* that causes parallel rays of light to move apart.



Name _____

(*j*) The photo shows waves in the sea. The energy of these waves has been suggested as a source of renewable energy.

Give a second *example* of a source of renewable energy.

Example _____

Name **one** other *kind* of energy that is transmitted (sent) as a wave.

Name _____

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

(*a*) Name the *property* of water that enables it to form drops like the one shown in the photo.

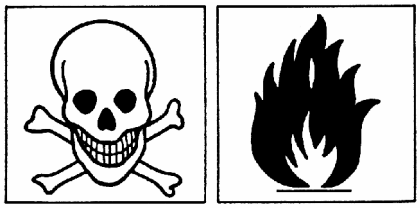
_____

(*b*) A sodium atom has 11 protons and 11 electrons.
How does a sodium *atom* become a sodium *ion*?

How? _____

Give the formula (symbol) for a sodium ion. _____

(*c*) Explain the hazard symbols A and B shown.



Symbol A Symbol B

A _____

B _____

(*d*) Zinc metal reacts with and dissolves in sulphuric acid.
Name *or* give the formulas of the **two** products of this reaction.

_____

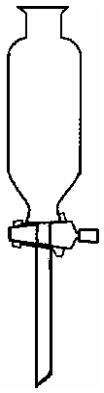
(*e*) The diagram shows sodium burning in air.
What is the *colour* of the flame?

Colour _____

What *effect* would the combustion product have on moist litmus paper/ pH paper?

Effect _____

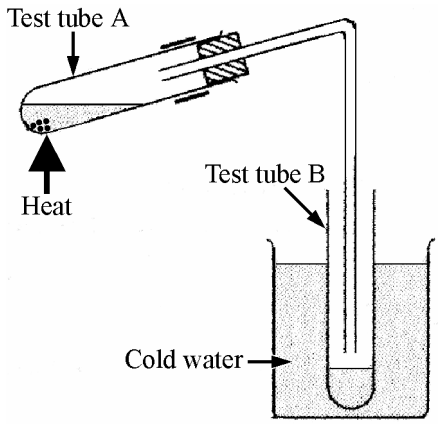
(*f*) Complete the diagram to show how the separating funnel, illustrated, can be used to *separate* a mixture of *oil and water*. Label the diagram.



(*g*) List the following elements in order of chemical *reactivity*: Fe, Mg, Cu, K and Ca.

_____

(*h*) Test tube A contains *hard* water and boiling chips. When the water in A is heated some of it evaporates and condenses in test tube B. Is the water in B still *hard* or is it *soft*? Give a *reason* for your answer.



Hard/soft? _____

Reason _____

_____

(*i*) Give **two** differences between a *mixture* of iron and sulphur powders and a *compound* of iron and sulphur (iron sulphide).

Difference one _____

Difference two _____

(*j*) Name **one** kind of fire extinguisher.
Name a *burning material* or other *item* that the kind of extinguisher that you have named can be safely used on.

Extinguisher _____

_____

Burning material/item _____

_____

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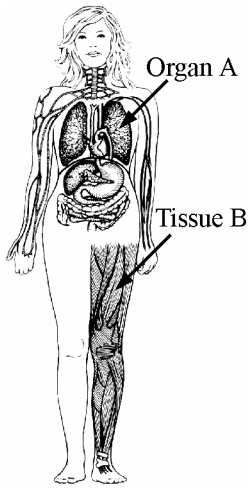
3. Answer **eight** of the following, (*a*), (*b*), (*c*), etc.



(*a*) Give the *function* of the organ labelled A in the diagram.

Function of A _____

_____

Give the *function* of the tissue labelled B in the diagram.

Function of B _____

(*b*) Name an *enzyme* and name a *substrate* (substance) on which it acts.

Name of enzyme _____

Name of substrate (substance) _____

(*c*) Seeds of the sycamore are shown in the diagram.
How are sycamore seeds *dispersed*?

How? _____

Why is seed dispersal *important* to plants?

Why? _____

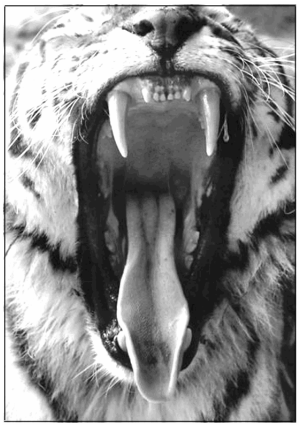
(*d*) Give **two** reasons why *cells divide*.

Reason one _____

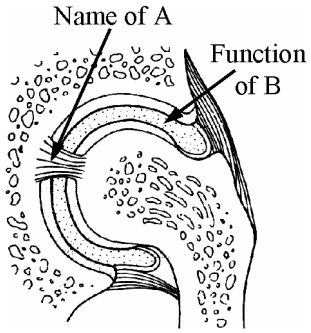
Reason two _____

(*e*) The photo shows the open mouth of a tiger.
Different types of teeth are clearly visible in the photo.

Name and label, using arrows,
two types of teeth
clearly visible in the photo.



(*f*) The diagram shows the structure of the hip joint. Name the *part* labelled A in the diagram.



A _____

Give the *function* of the part labelled B in the diagram.

B _____

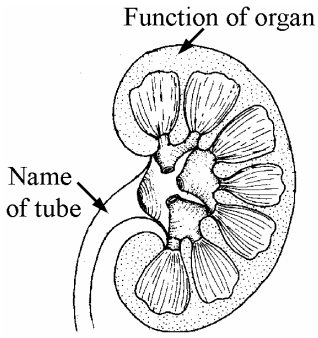
(*g*) What is transported in the *phloem* tissue of plants?

What? _____

Name a second type of plant transport (vascular) tissue.

Name _____

(*h*) Give the *function* of the organ shown in the diagram.



Function _____

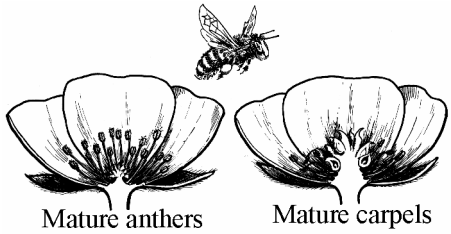
Name the *tube* shown in the diagram.

Name _____

(*i*) Give a simple *food chain*, with at least three levels, beginning with a *named* plant.

Food chain _____

(*j*) A bee visits a flower with *mature anthers* and then visits a flower, of the same species, with *mature carpels*. Why do bees *visit* flowers? What *role* does the bee play in the life of this plant?



Why? _____

What? _____

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