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, 2006

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

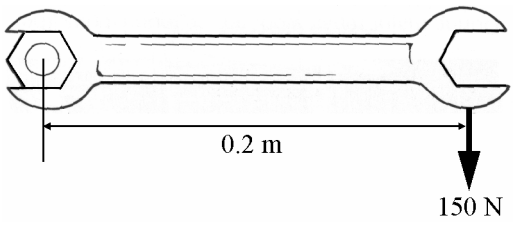
THURSDAY, 15 JUNE - MORNING, 9.30 to 12.00

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*) Calculate the *moment of the force* acting shown in the diagram.



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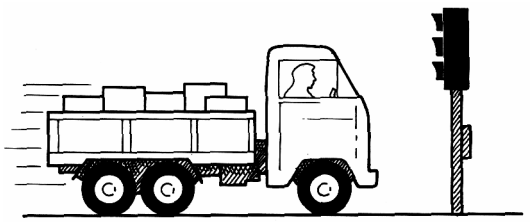
(*b*) A truck was travelling at 15 m/s when the driver applied the brakes and it stopped in 10 s. Calculate its average *acceleration*.



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(*c*) A body is in *stable equilibrium* if when it is slightly displaced and released it returns to its original position. How does the *centre of gravity* of such a body behave if it is in stable equilibrium?

_____

_____

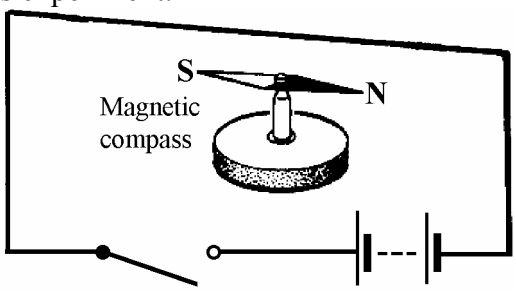
(*d*) A domestic electric grill is rated 1500 W. If a unit of electricity costs 12 cent how much does it *cost* to use the grill for 20 minutes a day for 30 days?

_____

_____

(*e*) Hans Christian Oersted (1777-1851), a Danish physicist, used the apparatus shown in the diagram to perform a famous experiment.

What happens to the compass needle when the switch is closed?



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What *conclusion* can be made as a result of this experiment?

_____

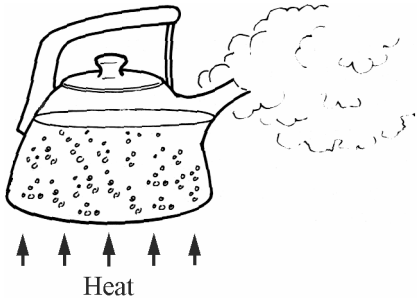
(*f*) When wiring a house to use *mains* electricity to which; *earth*, *live* or *neutral* should *fuses* be connected?

_____

Give a reason for your answer.

_____

(*g*) The kettle shown in the diagram was heated on a gas cooker. A pupil found that the temperature of the boiling water did not increase even though it was still being heated.



If there is no temperature change produced by this heat what *other effect* is the heat having on the water?

_____

_____

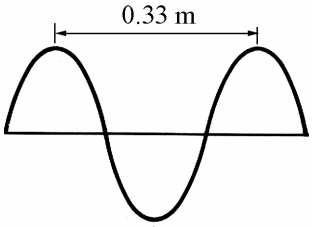
(*h*) Why are alcohol-in-glass thermometers used to measure *lower* temperatures while mercury-in-glass is used to measure *higher* temperatures?

_____

_____

_____

(*i*) The wave shown in the diagram has a velocity of 330 m/s.
What is the *frequency* of this wave?



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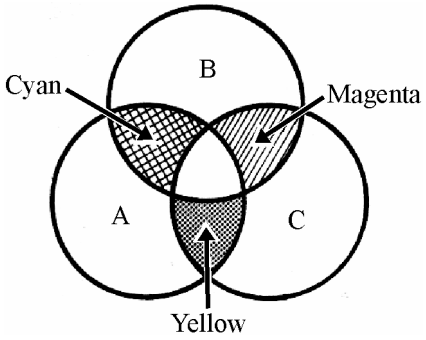
(*j*) Understanding coloured light is important in many areas. Recently its application in digital imaging and electronic colour is significant.

Name *any* **two** of the colours **A**, **B**, or **C**.

A _____

B _____

C _____



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

(*a*) Name the *separation method* shown in the diagram and name a *mixture* that can be separated in this way.

Separation _____

Mixture _____

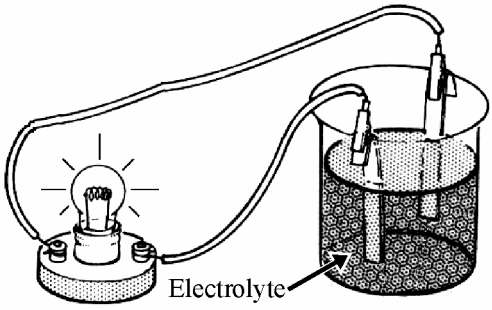
(*b*) What is an *element*?

_____

What is a *compound*?

_____

(*c*) The diagram shows a simple cell producing electric current from chemical reactions between two *different metals* and an *electrolyte*.



Name *two suitable* metals.

Names _____

_____

What is an *electrolyte*?

_____

(*d*) The pH scale is used to measure acidity and alkalinity.
Describe how you would *measure* the pH of a solution.

_____

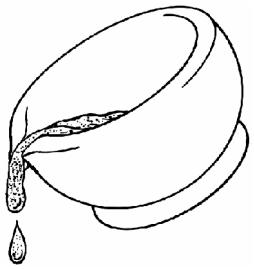
_____

(*e*) Define *oxidation* and *reduction*.

Oxidation _____

Reduction _____

(*f*) A pupil crushed and ground rock salt in the item shown in the diagram, then added water and poured out the mixture. *Name this piece* of equipment *and* its *complimentary piece* for crushing and grinding solid materials in a laboratory.



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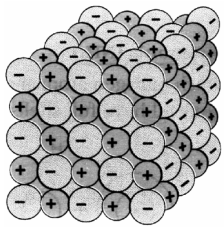
(*g*) What are *isotopes*?

_____

_____

(*h*) The diagram shows the *crystal structure* of sodium chloride. What do the spheres with the + signs represent?



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What *force* holds the particles in a crystal of sodium chloride together?

_____

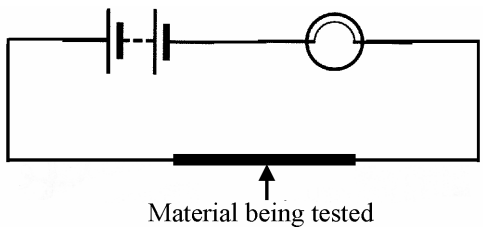
(*i*) Define the term *neutralisation*.

_____

_____

(*j*) The apparatus shown was used to test the *electrical conductivity* of metals and non-metals.

What result would you get with (*i*) a metal (*ii*) a non-metal?



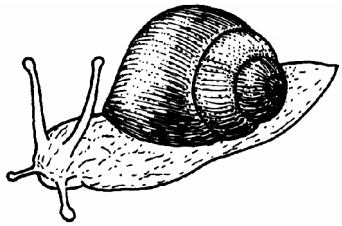
(*i*) a metal _____

_____

(*ii*) a non-metal _____

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

(*a*) Give **two** *characteristics* of living things.



One _____

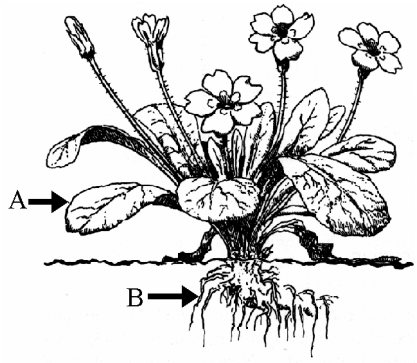
Two _____

(*b*) Explain the term *tissue*.

_____

_____

(*c*) The diagram shows a primrose.
Give **one** *function* for part **A** and
one *function* for part **B**.



A _____

B _____

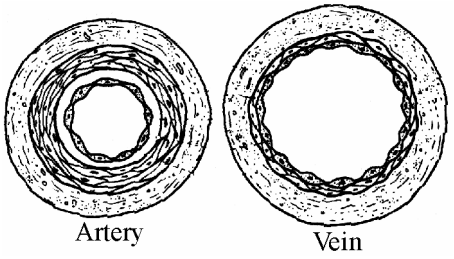
(*d*) Name a *hormone* and name the *gland* that secretes it.

Hormone _____

Gland _____

(*e*) The diagram shows a *cross section* through an artery and a *cross section* through a vein.

Why has the *artery* got a *much thicker* wall than the vein? Give **one** *other difference* between arteries and veins.



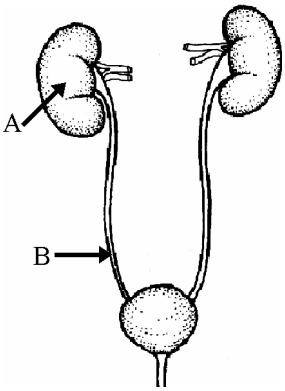
Why? _____

_____

Give _____

_____

(*f*) The diagram shows the urinary system.
Give the *function* of part **A**.



Function _____

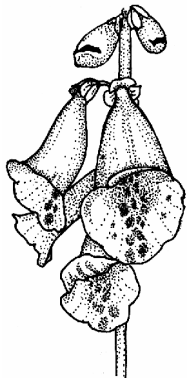
Give the *name* of part **B**.

Name _____

(*g*) Complete the equation for photosynthesis.

$6CO_2 + 6H_2O \longrightarrow$ _____ + _____

(*h*) The petals of the foxglove shown in the diagram are brightly coloured.
Suggest the way *pollination* happens in the foxglove.



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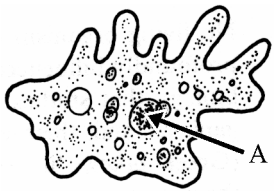
Give **one** *other* feature of a flower pollinated in this way.

_____

(*i*) The diagram shows a single celled animal called an amoeba.
The part labelled **A** is the *nucleus*.
Give **two** roles played the *nucleus* in the life of cells.

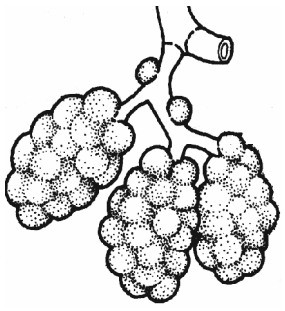


One _____

_____

Two _____

(*j*) The diagram shows *alveoli* (air sacs) found in the lung.
What are alveoli surrounded by?



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What happens to the air in the alveoli?

_____

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