

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

EXAMINATION NUMBER

[Empty box for examination number]

AN ROINN OIDEACHAIS

28154

JUNIOR CERTIFICATE EXAMINATION, 1996

SCIENCE — ORDINARY LEVEL

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

TUESDAY, JUNE 11 – AFTERNOON 2.00 – 4.30

SECTION A TO BE ANSWERED BY ALL CANDIDATES.

(Sections B, C, D, E are on separate sheets).

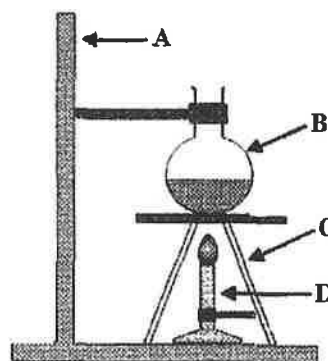
Answer the questions in the spaces provided.

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 labelled A, B, C and D.

- A
- B
- C
- D



(b) What is the function of a thermometer?

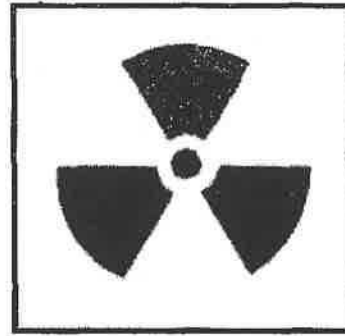
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Complete the following:-

The freezing point of water is°C.

The boiling point of water is°C.

- (c) The diagram shows the sign used to warn people about radioactive substances.



Give one use for radioactive substances.

.....

Give one harmful effect of radioactive substances.

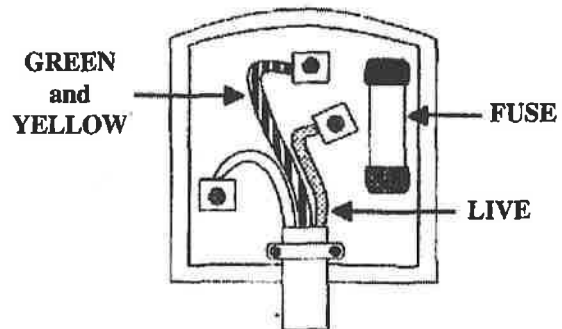
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- (d) The Earth is one of nine planets that orbit the Sun.

Name two other planets in the Solar System. 1 2

What is a galaxy?

- (e) The diagram shows the way in which a three-pin plug is wired.



What colour is the live wire?

Which wire is usually coloured yellow and green?

.....

What is the purpose of the fuse?

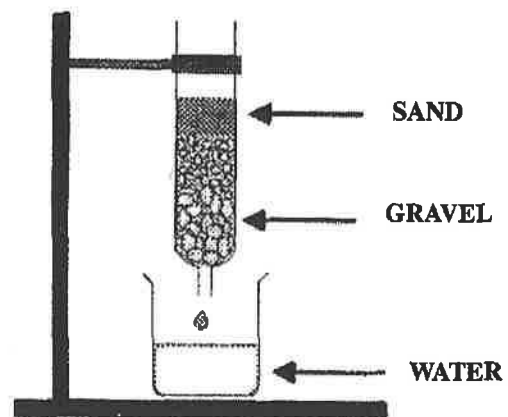
- (f) Water is purified in several stages in treatment plants. One of these stages is screening.

Explain what is meant by screening.

.....

.....

.....



Which stage of treatment is shown in the diagram?

.....

Why is water chlorinated?

(g) Fire extinguishers contain materials which put out fires.

Give one advantage of using a fire extinguisher which contains water.

Name two substances other than water which can be used in fire extinguishers.

(i)..... (ii).....

(h) Name a metal

Give **one** use for the metal named.....

Name an alloy

Give **one** use for the alloy named.

(i) Fill in the spaces below with the correct words from the following list.

WATER, A SOLUTION, SALT

.....is dissolved into make

A is a solution of 30 g sugar in 1 litre of water and B is a solution of 100 g sugar in 1 litre of water.

Which is the more dilute solution?

(j) Fill in the spaces below using the correct phrases from the following list.

MELTING OF ICE, BURNING OF PAPER, RUSTING OF IRON, BREAKING OF GLASS.

.....andare examples of physical changes.

.....andare examples of chemical changes.

(k) The table shows the composition of two different foods A and B.

	Food A	Food B
Energy	1680 kJ	1285 kJ
Protein	6 g	10 g
Lipid	6 g	1 g
Carbohydrate	31 g	67 g
Fibre	0 g	15 g
Calcium	530 mg	0 mg
Vitamin C	0 mg	35 mg
Iron	13 mg	40 mg

Which food, A or B, would help prevent constipation?.....

Why?.....

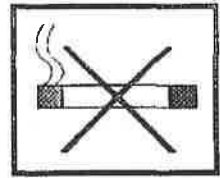
Which food, A or B, would help in the formation of healthy teeth and bones?.....

Why?.....

(l) State **two** ways in which smoking can damage your health.

(i)

(ii)



Complete the sentence:-

Respiration is the release of from

(m) The diagram shows a flowering plant.

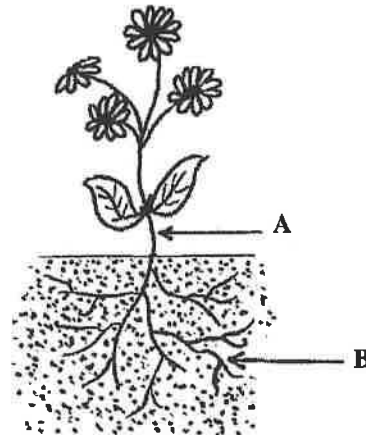
Name the parts labelled A and B.

A

B

Give **one** function of the leaf.

.....



(n) State **two** uses of fungi or bacteria in industry or medicine

.....
.....

Name a disease caused by a virus.....

(o) State **one** way in which plants depend on animals.

.....

State **one** way in which animals depend on plants.

.....

Choose **one** of (i), (ii), (iii) to construct a food chain,

OR

Construct a food chain from a habitat you have studied. In either case, begin the chain with a plant.

(i) ladybird, rose leaves, spider, greenfly

(ii) waterfleas, stickleback, trout, plant plankton

(iii) plant plankton, seagull, whelk, barnacle

.....

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Section A is on a separate sheet which provides space 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.

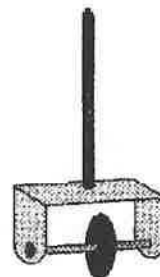
Choose any **three sections** from **B, C, D, E**.

Answer **two** questions from each chosen section. All questions carry equal marks.

SECTION B - PHYSICS (72 marks)

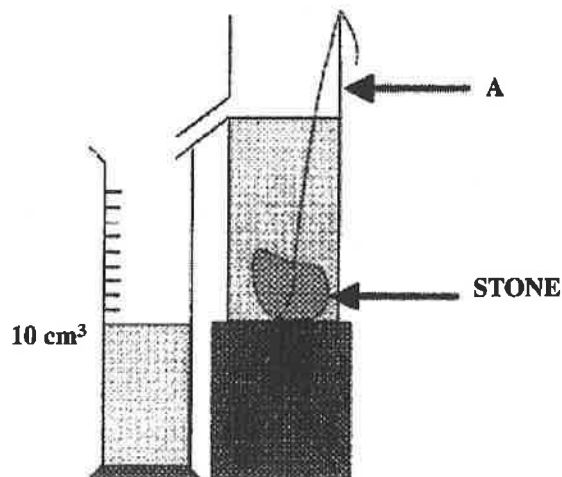
Answer any **two** questions.

2. (a) The diagram shows an opisometer. For what would you use it? (6)
- (b) Describe how you would measure the area of your hand. (9)



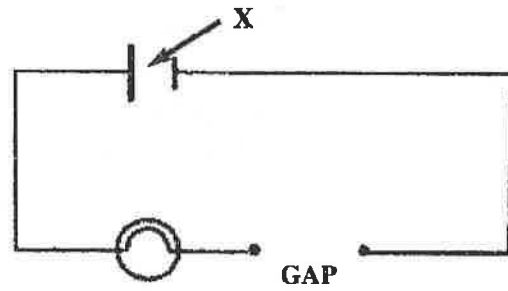
- (c) The diagram shows the apparatus used to find the volume of a stone.

- (i) Name the piece of apparatus labelled A. (3)
- (ii) What is the volume of water in the graduated cylinder? (3)
- (iii) What is the volume of the stone? (6)
- (iv) If the stone has a mass of 70 g calculate the density of the stone in g cm^{-3} . (6)
- (v) Is the stone more or less dense than water? (3)



3. (a) (i) What is measured in amps ? (3)
(ii) Calculate the cost of running a 2 kW heater for 5 hours if one unit of electricity costs 10p (6)

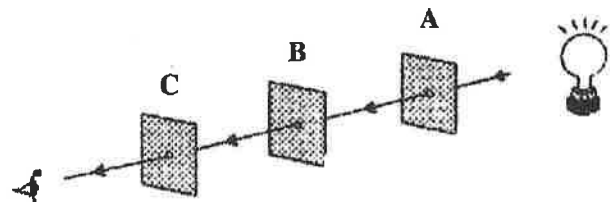
(b) The circuit on the right was set up to find out if a substance is a conductor of electricity.



- (i) The bulb did **not** light when a glass rod was placed across the gap in the circuit. What does this tell you about glass? (6)
(ii) Name the device marked X. (3)
(iii) If a second bulb is placed in series in the circuit and electricity allowed to flow, what effect will this have on the bulbs? (6)

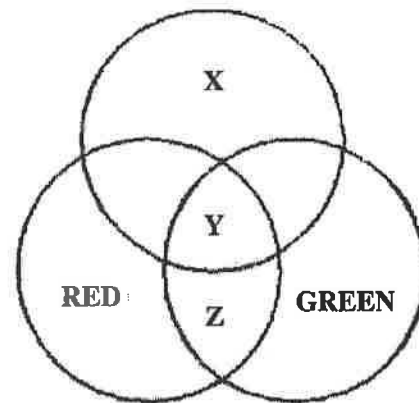
(c) Describe, with the help of a labelled diagram, an experiment to show the magnetic field of a bar magnet. (12)

4. (a) The diagram shows a ray of light passing through holes in three sheets of cardboard A, B and C.



- (i) What happens if card B is moved to one side? (3)
(ii) What does this tell you about the way light travels? (6)

(b) The diagram represents the mixing of the primary colours of light.



- (i) Name the missing primary colour X. (3)
(ii) What colour would you get at Y ? (3)
(iii) Name the colour Z. (3)
- (c) (i) What is an echo? (6)
(ii) Describe a simple experiment to show how an echo can be produced in the laboratory. (12)

SECTION C - CHEMISTRY (72 marks)

Answer any **two** questions.

5. (a) (i) What is an element? (3)

(ii) Match each element with the correct symbol from the following lists

ELEMENT	Sodium	Sulphur	Silicon	Nitrogen
SYMBOL	N	Si	S	Na

(12)

(b) (i) What is a mixture? (3)

(ii) How would you separate a mixture of sulphur and iron filings? (6)

(iii) Describe, with the help of a labelled diagram, the experiment you would carry out to separate a mixture of sand and water. (12)

6. (a) Litmus paper is an indicator which shows if a substance is an acid or a base.

(i) What colour is litmus paper in acid? (6)

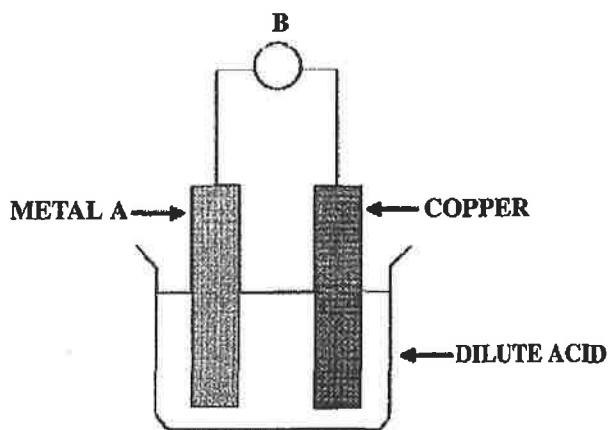
(ii) List two substances in the home which are acidic. (6)

(iii) Describe an experiment to show the reaction of an acid and a metal. (12)

(b) The diagram shows a simple cell.

(i) Name the metal labelled A. (6)

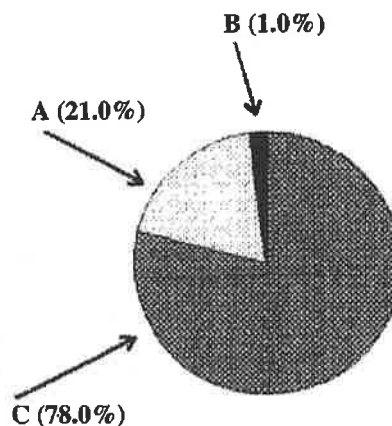
(ii) What would you place at B in the circuit? (6)



7. (a) Air is a mixture of gases. The pie chart shows the percentage of each gas found in the air.

(i) Which gas is represented by C? (3)

(ii) Name any one gas, apart from water vapour, which is represented in B. (6)



(b) Describe a simple experiment to show the presence of water vapour in the air. (12)

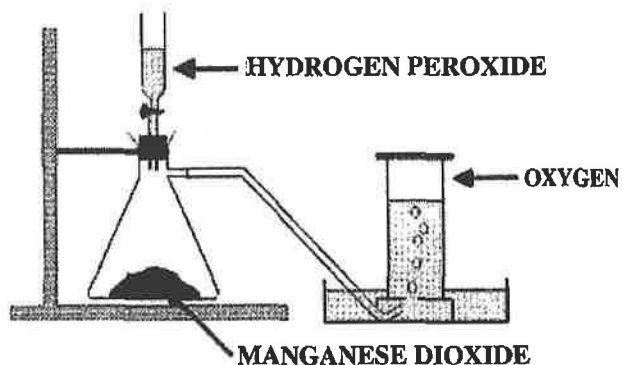
(c) The apparatus on the right was set up to prepare oxygen.

(i) Write the chemical formula for oxygen gas. (3)

(ii) Copy and complete the word equation for the preparation of oxygen. (6)

Hydrogen Peroxide \rightarrow _____ and _____ (6)

(iii) What test would you carry out to show that the gas collected is oxygen? (6)

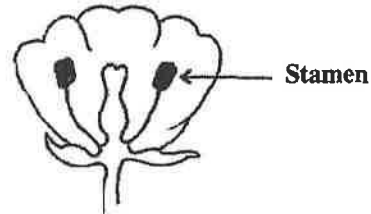


SECTION D - BIOLOGY (72 marks)

Answer any two questions.

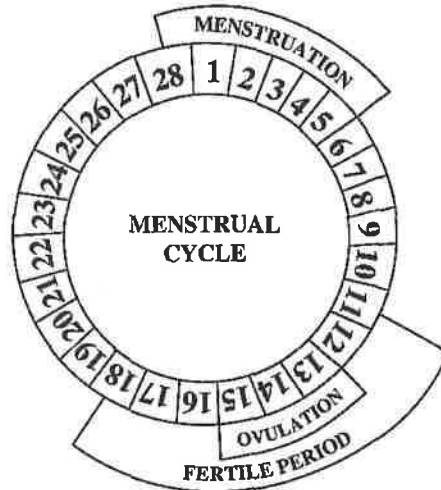
8. (a) (i) Name one plant that uses the wind to scatter its seeds. (3)
- (ii) Name another method used by plants to scatter seeds. (3)

(b) The diagram shows the structure of a flower.



- (i) What is the function of the flower? (6)
- (ii) What is produced by the stamens? (6)

(c) The diagram represents the menstrual cycle.



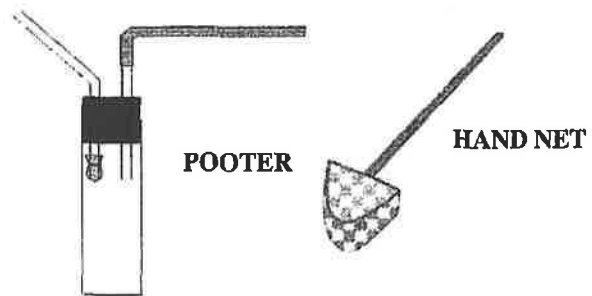
- (i) What is released during ovulation? (6)
- (ii) Explain what is meant by the fertile period. (6)
- (iii) On which day of the cycle does menstruation begin? (6)

9. (a) The diagrams show some of the pieces of apparatus used in a study of a habitat.

- (i) Name a habitat you have studied. (3)
- (ii) State the purpose of any one of the following:

POOTER, HAND NET, PITFALL TRAP, SIEVE (6)

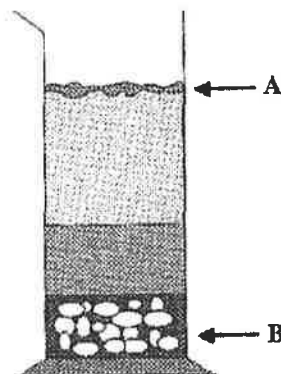
- (iii) Describe how you would use a quadrat in a study of the plants in a habitat. (6)



(b) A sample of soil is shaken with water and allowed to settle. The result is shown in the diagram.

- (i) What type of material is found at A? (3)
- (ii) What does B represent? (6)

(c) Describe how you would measure the amount of air in a soil sample. (12)



10. (a) One of the functions of the skeleton is to protect the soft body organs.

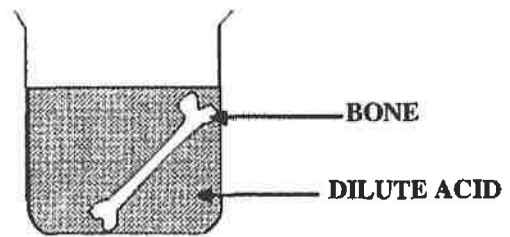
(i) Name a body organ which is protected by the skeleton. (3)

(ii) Give another function of the skeleton. (3)

(b) The diagram shows an experiment which was set up to show the effect of acid on bone.

(i) What would you notice about the bone after a few days? (6)

(ii) What has been removed from the bone? (6)

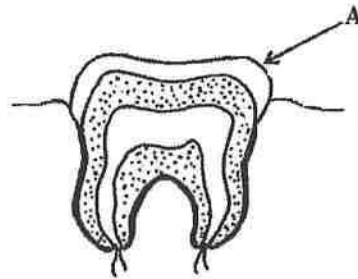


(c) (i) Name the part of the tooth labelled A. (3)

(ii) What type of food speeds up tooth decay? (3)

(iii) What is plaque? (6)

(iv) What would you use to show up the plaque on teeth? (6)



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SECTION E - APPLIED SCIENCE (72 marks)

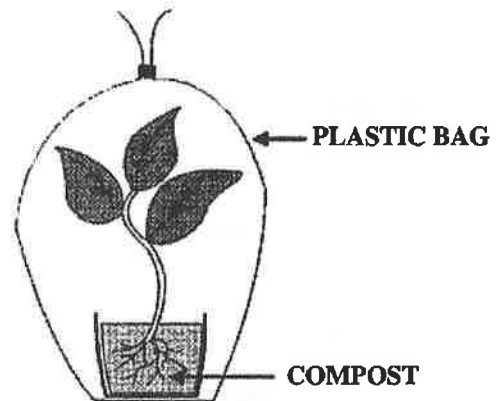
Answer any **two** questions.

11. EARTH SCIENCE

- (a) The Earth's movements lead to days, seasons and years.
- (i) How long does it take the Earth to completely orbit the sun ? (3)
 - (ii) Why do we have a leap year every fourth year ? (6)
 - (iii) Explain, with the help of a diagram, how the different seasons are caused. (9)
- (b) (i) If you were recording the weather, what instrument would you use to measure rainfall ? (3)
- (ii) What would you measure with an anemometer? (3)
- (c) Describe the experiment you would carry out to show that the rate at which water evaporates is affected by temperature and wind. (12)

12. HORTICULTURE.

- (a) (i) The water supply for plants can be controlled by **irrigation** and **drainage**. Explain both terms. (6)
- (ii) Water is needed for the healthy growth of plants. Name two other needs. (6)
- (b) Describe how you would prepare a seed tray and sow some lettuce seeds in it. (12)
- (c) The diagram shows a cutting which has been taken from a Busy Lizzie plant and potted.
- (i) Give a reason for using the plastic bag. (6)
 - (ii) State one other procedure which would ensure successful growth of the cutting (6)



13. MATERIALS SCIENCE

(a) Which material from the list on the right would be most likely to be used

- | | | |
|--|-------------|-----|
| (i) to make flooring | Polystyrene | |
| (ii) as packing in a parcel to protect glass | Nylon | |
| (iii) to make rope. | Cotton | |
| | Chipboard | (9) |

(b) Draw the symbols you would expect to find on the care label of a shirt which

- (i) can be bleached
 - (ii) can be machine washed at 50°C
 - (iii) can be tumble dried
- (9)

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

A. PLASTICS

- (i) Give one reason plastic is used to cover electric cables. (6)
- (ii) Describe a simple experiment to compare the flexibility of two plastics. (12)

OR

B. TEXTILES

- (i) Name a textile which is made from natural fibres. (3)
- (ii) Name a textile which is made from man-made fibres. (3)
- (iii) Describe, with the aid of a labelled diagram, how you would compare the absorbency of two textiles. (12)

OR

C. METALS

- (i) Explain why gold is normally mined in a fairly pure state and iron is not. (6)
- (ii) Describe an experiment to compare the hardness of two metals. (12)

OR

D. TIMBER

- (i) Name a softwood. (3)
- (ii) Give one use for softwoods. (3)
- (iii) Describe an experiment to compare the densities of seasoned (dried) wood and unseasoned (fresh) wood. (12)

14. FOOD

(a) Select a food from the list on the right which

- (i) contains a large amount of fat.
- (ii) would turn blue/black if iodine solution were added to it.
- (iii) contains substances needed for growth and repair in the body
- (iv) contains fibre.

- Brown bread (3)
- Butter (3)
- Potato (3)
- Fish (3)

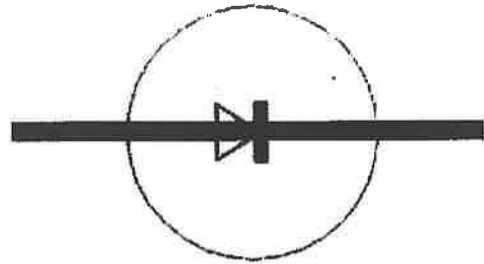
(b) Food additives such as colourings and flavourings are used in many foods.

- (i) Give one advantage of food additives. (6)
- (ii) Give one harmful effect of some food additives. (6)

(c) Describe how you could make your own yoghurt. (12)

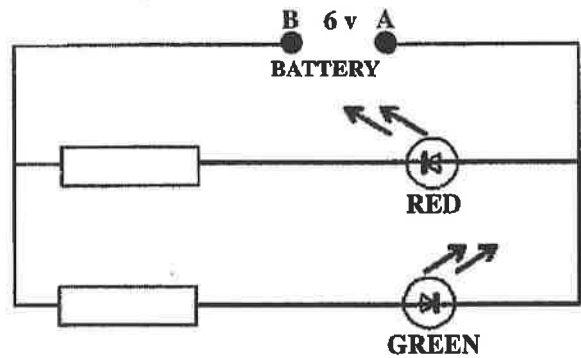
15. ELECTRONICS

- (a) (i) Name the device whose symbol is drawn on the right. (6)
- (ii) What is the function of this device? (6)



(b) The circuit on the right was set up to find out which terminal (A or B) of a battery was positive (+) and which was negative (-).

- (i) If only the red LED lights what does this tell you about terminal A? (6)
- (ii) What is the reason for using the 330 Ω resistors? (6)



(c) Draw a circuit diagram showing a battery, an open switch and two bulbs connected in parallel. (12)

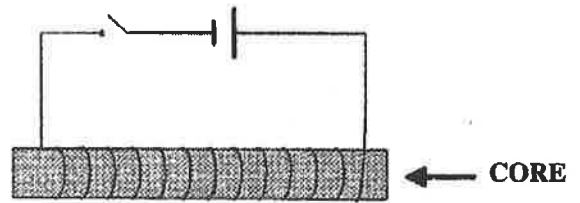
16. ENERGY CONVERSIONS

(a) What is energy ?

(6)

(b) The diagram shows a simple electromagnet.

- (i) What metal would you use in the core? (3)
- (ii) What type of energy change takes place in the electromagnet when the switch is closed? (6)
- (iii) How would you show that an electromagnet has been formed? (6)
- (iv) Give one use of an electromagnet. (3)



(c) Describe, with the help of a labelled diagram, how you would show that stored energy can be released from food e.g. peanuts. (12)