AN ROINN OIDEACHAIS

INTERMEDIATE CERTIFICATE EXAMINATION, 1987

SCIENCE—SYLLABUS E

7484

WEDNESDAY, 17 JUNE — MORNING, 9.30 to 12.00

Answer question 1 and five other questions.
All questions carry equal marks.

1. Answer *ten* of the following items. (Keep your answers short).

(*a*) Name the acid in sour milk.

(*b*) In the diagram of the tooth, Fig. 1, name any *two* of the parts labelled L, M, P and Q.

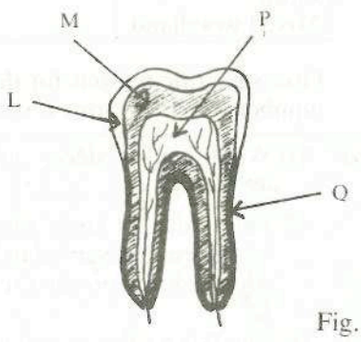

Fig. 1.

(*c*) The boiling point of water is R °C, its freezing point is S °C and its density is T g/cm^3. What do the letters R, S and T represent?

(*d*) The Diagram Fig. 2, shows the human arm. Name the bones marked R, S and T.

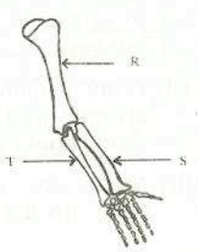

Fig. 2.

(*e*) Name the acid formed when water combines with CO_2.

(*f*) In the diagram Fig. 3, name any *two* of the parts labelled A, B, C and D.

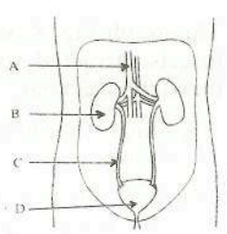

Fig.3

(*g*) Give *one* use for an antibiotic.

(*h*) In the diagram Fig. 4, what will happen when a current of air is passed through tube Z?

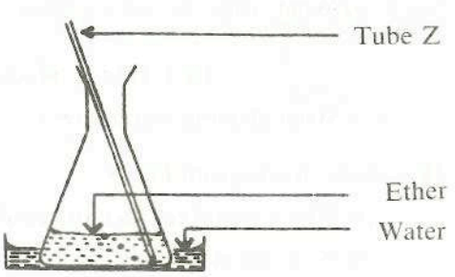

Fig. 4.

(*i*) Name *three* methods by which seeds are dispersed.

(*j*) In the diagram Fig. 5, what are the tiny blood vessels marked Y called?

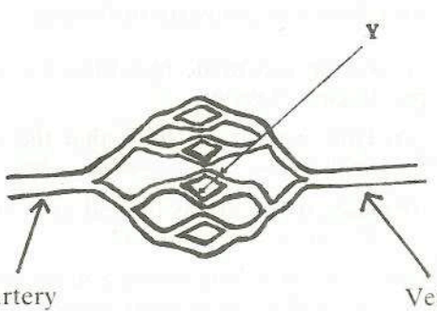

Fig. 5.

(*k*) Why do people in sunny climates wear brightly coloured clothes?

(*l*) Why do you often find broken snail shells near stones in a quiet place?

(*m*) Where in the human body is saliva produced?

(*n*) In the diagram Fig. 6, a pupil cannot unscrew the nut with this spanner. To get a better turning effect should the spanner used be (a) wider, (b) longer, (c) thinner or (d) shorter?

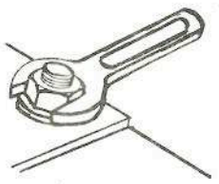

Fig. 6

(*o*) Why are peas and beans used in crop rotation?

2. What is a *biennial* plant? Give *two* examples.

(*b*) Describe an experiment to demonstrate the conditions necessary for germination.

(*c*) In an experiment to estimate the number of earthworms in different habitats with similar soil types, a class obtained the following results:

Habitat	Number of earthworms/m^2
Vegetable garden	100
Grazed pasture	315
Lawn	28
Mixed woodland	460

Give scientific reasons for the differences in the number of earthworms found.

3. (*a*) (i) What causes decay in dead plants and animals?

(ii) The bodies of large animals are sometimes found well preserved in Irish bogs. Explain why they are preserved.

(*b*) (i) The types of food eaten by two animals A and B are shown in the diagram Fig. 7. Is A a carnivore or herbivore? Explain your answer.

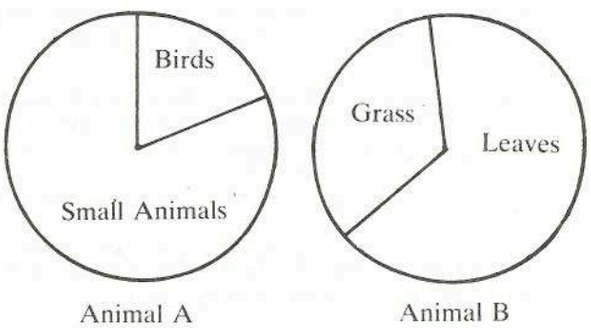

Fig. 7.

(ii) From a named habitat you have studied, arrange four named species into a simple food chain.

(iii) Name one consumer and one producer from this habitat.

(*c*) The graph Fig. 8, shows the average number of insects attracted to a jar of jam each month throughout a year.

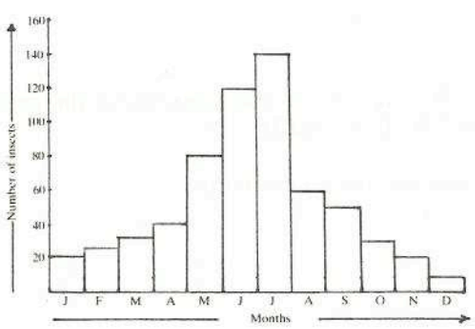

Fig. 8

(i) Study the graph and explain the result shown.

(ii) Many flowers attract insects. How and why does this occur?

4. (*a*) (i) What acids are represented by any *two* of the following:

HCl, HNO_3, H_2SO_4?

(ii) What element is common to all three acids?

(*b*) Study the diagram Fig. 9,

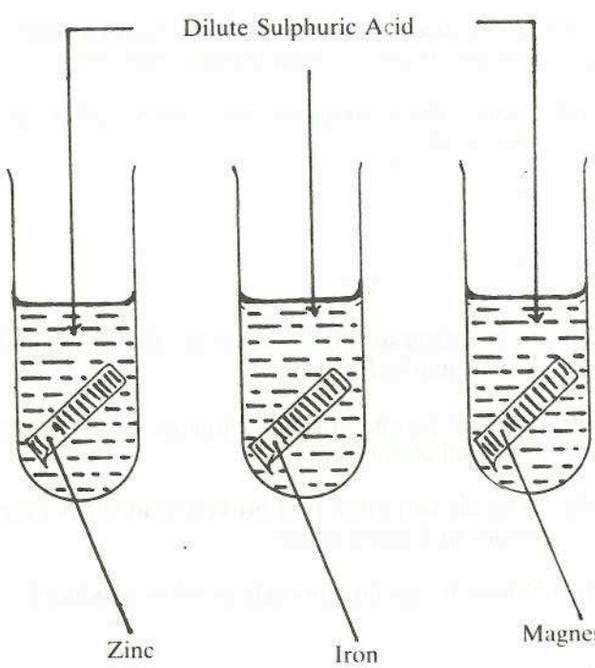

Fig. 9.

(i) Which metal reacts most easily?

(ii) What gas is released when this metal reacts?

(iii) How would you identify this gas?

(iv) Give one property of this gas.

(*c*) A solution was made by adding 1 gram of acid per 10 cm^3 of water.

(i) How would you show that the solution is acidic?

(ii) How many grams of acid are contained in 50 cm^3 of the solution?

(iii) If 50 cm^3 of the solution neutralises 20 cm^3 of an alkali, how many grams of acid will be needed to neutralise 80 cm^3 of the alkali?

(iv) Explain the term *neutralisation*.

5. (*a*) What do we need in addition to protein to have a balanced diet?

(*b*) A person drinks a glass of milk. Describe what happens to this food at each of the areas labelled L, M, P and Q in the diagram Fig. 10.

(*c*) (i) If 1 gram each of beans, sugar and fat are burned separately, which one produces the most energy?

(ii) Why is fibre important in diet?

(iii) Food packets sometimes carry the following message:
"This food contains no additives". What are the possible advantages/disadvantages of eating such food?

(iv) Apart from being a source of energy, what are the uses of fat in the body?

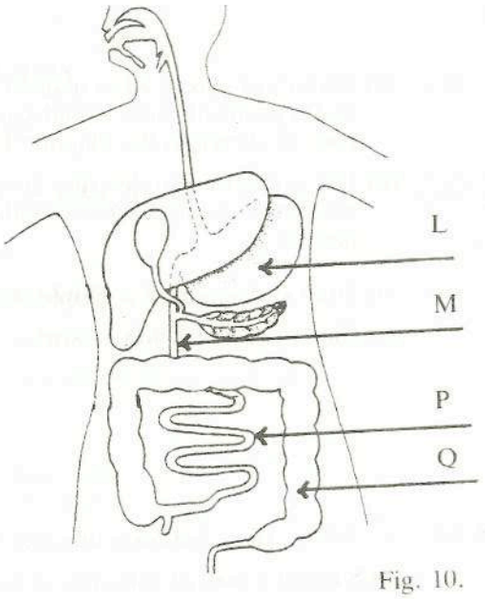

Fig. 10.

6. (*a*) (i) Name the two main gases in the air.

(ii) Name two other gases found in the air.

(*b*) Examine the weather map in the diagram Fig. 11,

(i) Describe the type of weather over the west of Ireland during 1/11/1986.

(ii) What happens to the mercury in a barometer during this type of weather?

(iii) Draw a labelled diagram of a mercury barometer.

(iv) What is an *anticyclone?*

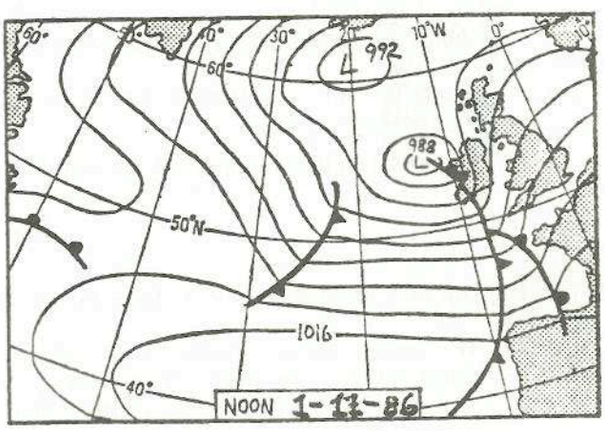

Fig. 11.

(*c*) Examine the diagram Fig. 12, of the water cycle.

(i) Explain what happens at A, B and C?

(ii) How does some of the rainfall end up in the leaves of plants?

(iii) How does rainfall help in the erosion of rocks?

(iv) What is "acid rain"?

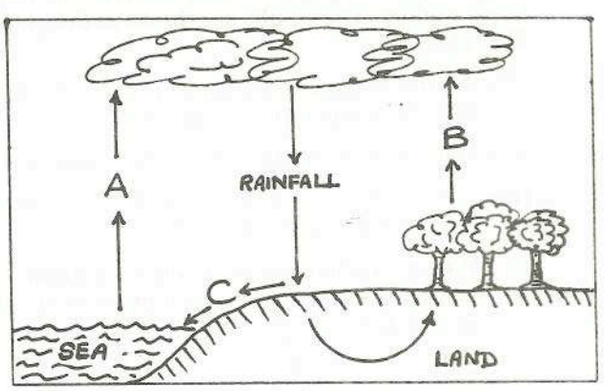

Fig. 12.

7. (*a*) (i) What is an electric current?

(ii) Look at the diagram Fig. 13. Which of the circuits A or B will use the larger current? Explain your answer.

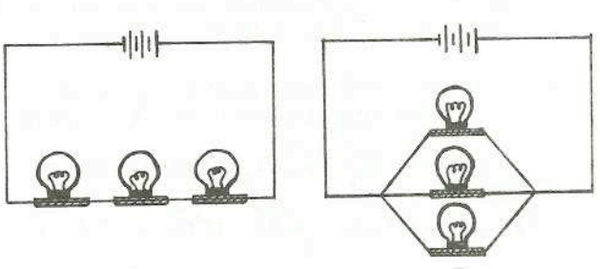

Fig. 13.

(*b*) (i) If you were given a bar magnet, iron filings and a postcard, how would you obtain the pattern shown in the diagram Fig. 14?

(ii) Use a diagram to describe how you would magnetise an old hacksaw blade with a bar magnet.

(*c*) (i) Draw a diagram of a simple electric bell.

(ii) Clearly describe how it works.

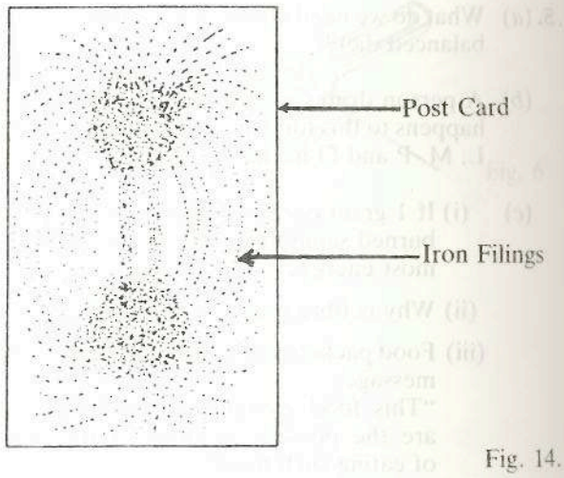

Fig. 14.

8. (*a*) (i) What causes *hardness* in water?

(ii) Suggest a way of softening water.

(*b*) A beaker contains a mixture of sand, sodium chloride and water. Describe how you would obtain a pure sample of:

(i) sand, (ii) sodium chloride, (iii) water.

(*c*) (i) Describe an experiment to show the composition of water.

(ii) Draw a labelled diagram of the apparatus used.

9. (*a*) Explain how a thermos flask reduces heat loss.

(*b*) (i) In some years, spring and summer temperatures are lower than average in Ireland. Give two ways this can affect plants or animals.

(ii) After freezing weather in winter, water pipes sometimes leak. Explain why.

(*c*) A flask of very hot water was placed on a bench in a laboratory and the temperature was read every minute. The results are shown in the graph Fig. 15.

(i) At the beginning of the experiment, what was the temperature of the water?

(ii) What was the temperature after 6 minutes?

(iii) What do you think will be the final temperature of the water?

(iv) Which contains more energy: a gram of boiling water at 100 °C or a gram of steam at 100 °C?

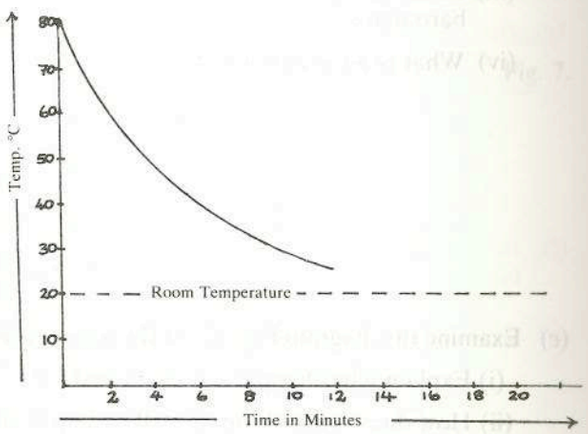

Fig. 15.

10. (*a*) In the diagram Fig. 16, name any four parts of the eye labelled L, M, N, P, Q, R.

(*b*) Describe an experiment to demonstrate the dispersion of white light by a glass prism.

(*c*) (i) What biological process do each of the following equations A and B represent?

A: $\text{ENERGY} + CO_2 + H_2O \Rightarrow C_6H_{12}O_6 + O_2$

B: $O_2 + C_6H_{12}O_6 \Rightarrow CO_2 + H_2O + \text{ENERGY}$

Explain your answer in each case.

(ii) What is the source of energy in equation A.

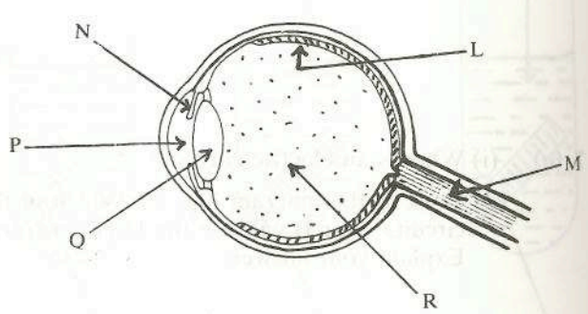

Fig. 16.