

AN ROINN OIDEACHAIS

INTERMEDIATE CERTIFICATE EXAMINATION, 1978

SCIENCE—SYLLABUS E

WEDNESDAY, 14 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) How does good drainage of pasture land help to control the liver fluke?

(b) What gas is being produced in the experiment shown in the diagram Fig. 1?

(c) A piece of blue cobalt chloride paper when exposed to the air soon turns a pink colour. What part of the air causes this change?

(d) Study diagram Fig. 2 and then state briefly how the automatic flushing tank works.

(e) Diamond and graphite are the allotropes of what element?

(f) What information about the composition of water will be obtained from the experiment shown in diagram Fig. 3?

Fig. 1

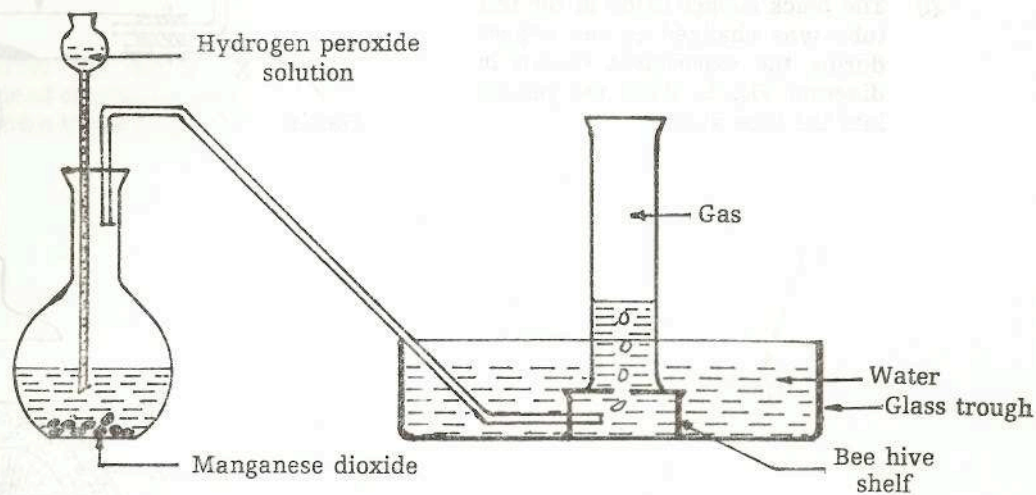


Fig. 2

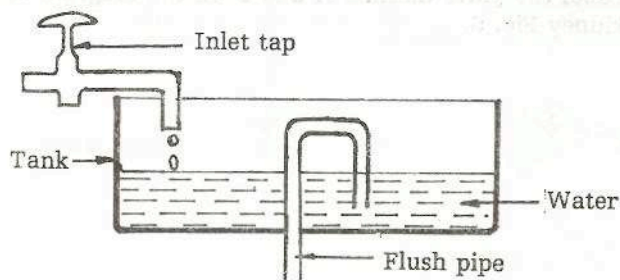


Fig. 3

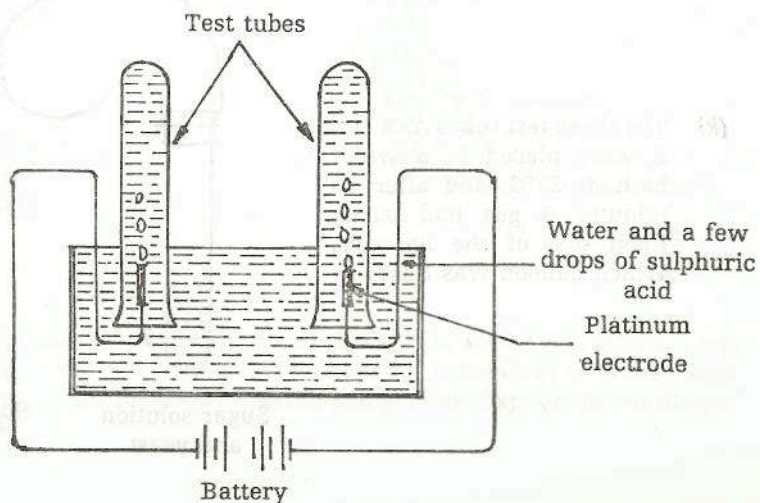
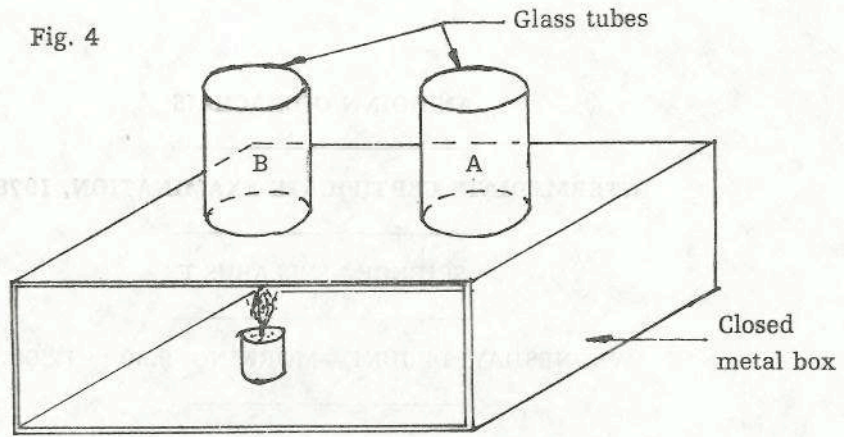


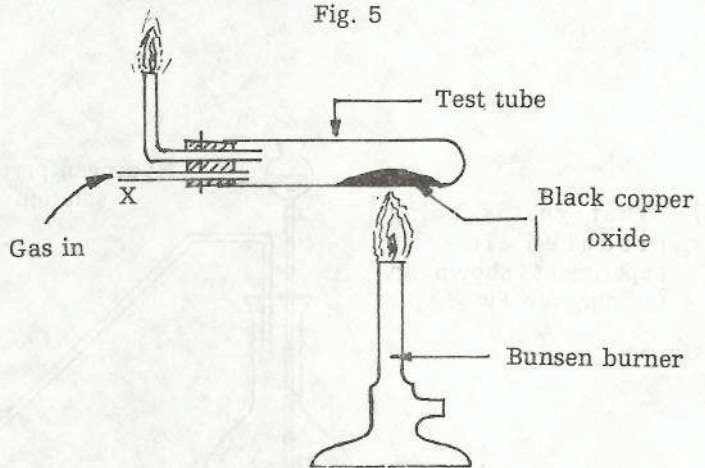
Fig. 4



- (g) Explain what happens to the smoke from the smouldering cloth when it is held over tube A.

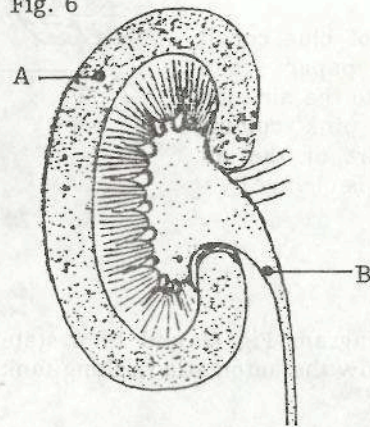
- (h) The colour of a sample of blood containing carbon dioxide becomes a bright red when oxygen is bubbled through it. What part of the blood combines with oxygen to cause this change?

Fig. 5



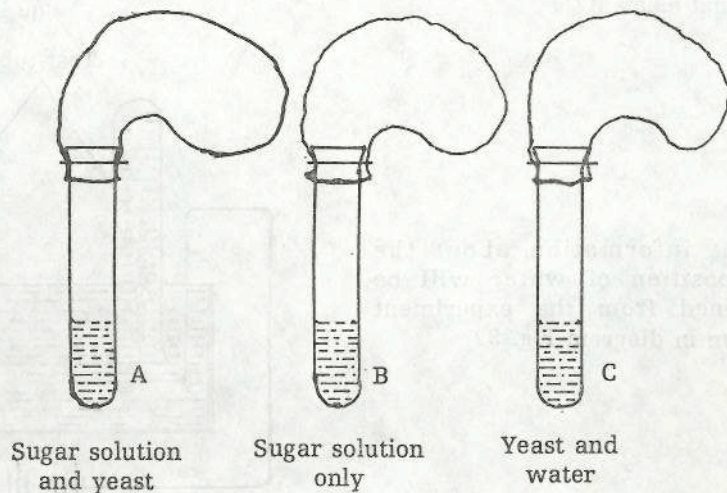
- (i) The black copper oxide in the test tube was changed to red copper during the experiment shown in diagram Fig. 5. What gas passed into the tube at X?

Fig. 6



- (j) Label the parts marked A and B on the diagram of the kidney Fig. 6.

Fig. 7



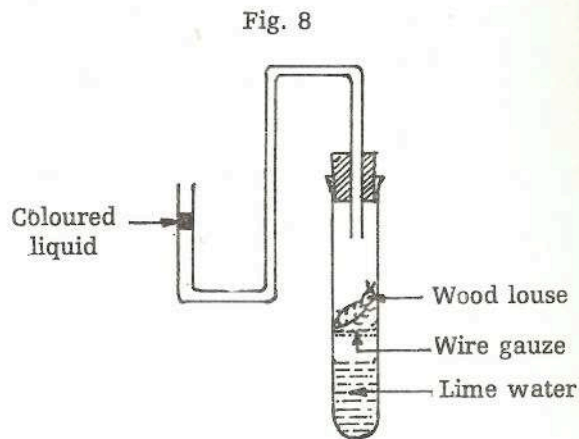
- (k) The three test tubes A, B and C were placed in a water bath at 37°C, and after 30 minutes a gas had partly filled one of the balloons. Which balloon was this?

(l) Give three advantages of friction in everyday life.

(m) Name two garden insect pests.

(n) What change will take place in the lime water and in the position of the drop of coloured liquid, after about half an hour from the time the experiment shown in diagram Fig. 8 is set up?

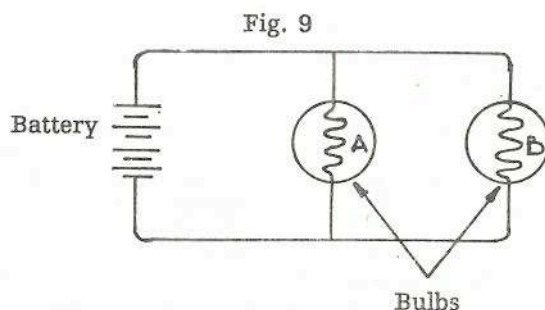
(o) Name one sedimentary and one metamorphic rock.



2. (a) When placed in a cylinder of milk a lactometer shows a reading of 1.032. What happens to the reading if water is added to the milk?
- (b) A piece of thread is tied around a brick which is then lifted by the thread. The thread breaks. If the brick is placed in a bucket of water and lifted by the thread, the thread does not break. Explain why this is so.
- (c) The side of a solid cube of iron is 10cm. Calculate its mass if the density of iron is 6.5 g/cm^3 .

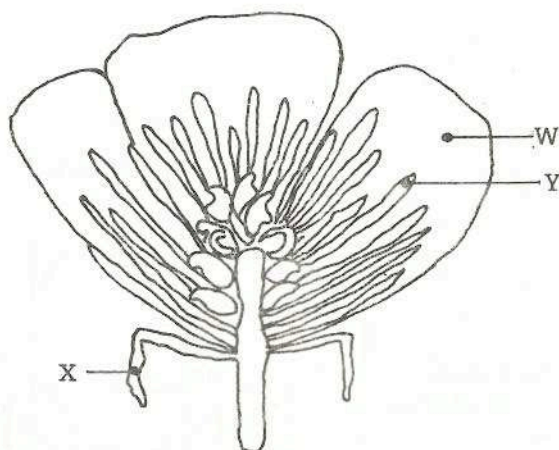
3. (a) If a bar magnet is allowed to float on a piece of cork on water, in what direction will it point when it comes to rest?
- (b) Describe how you would find out that an electric current passing through a wire has a magnetic effect.

(c) Study this experimental circuit. Draw a diagram of it in your answer book showing where you would place a resistance wire in order to dim the bulb B without dimming bulb A.



4. (a) What are biennial plants? Give one example.

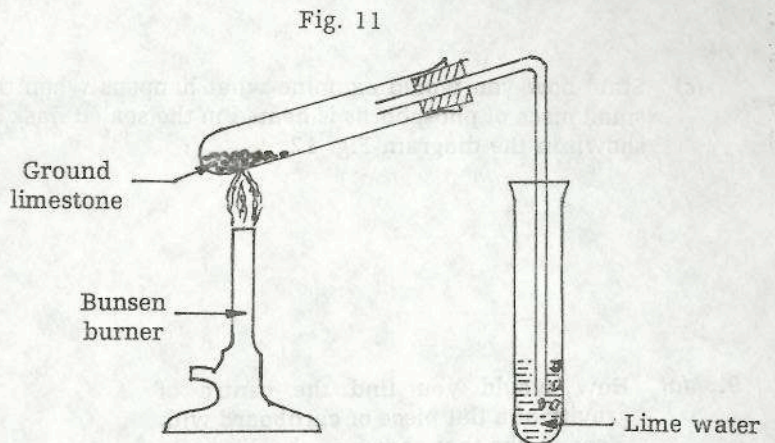
(b) Name the parts of the flower marked W, X and Y in the diagram Fig. 10. Give the function of any one part you name.



(c) In an experiment, the stamens are removed from the flowers of pure dwarf pea plants. Pollen grains from the flowers of pure tall pea plants are then brushed on the stigmas of the flowers of the dwarf pea plants. Each flower is then covered with a fine muslin bag. The ripe seeds are collected and sown. Will the new pea plants be tall or dwarf? Explain your answer.

5. (a) Name any *three* organisms which you are likely to find in a water habitat.
- (b) Describe how any *one* organism from a water habitat obtains its food and forms a link in a food chain.
- (c) Describe simple experiments to show the response of (i) a plant, and (ii) an animal, to light.
6. (a) When a piece of calcium metal is added to water, it reacts with it producing a compound which turns red litmus paper blue. What is the name of this compound?

- (b) When ground limestone in the test tube is heated, a gas which turns lime water milky is produced. What is the name of the gas and what compound does it form when it reacts with the lime water?



- (c) In an experiment to find out how much washing up liquid (soap solution) was needed to form a permanent lather on three different 50 cm³ water samples, the following results were obtained:

Water samples (50 cm ³)	Volume of washing up liquid added
Rain water	6 cm ³
Tap water (not boiled)	28 cm ³
Tap water (boiled, cool)	7 cm ³

Give the reasons for each of the results obtained with reference to the substances dissolved in the water samples.

7. (a) Name any *one* fungal disease of crops.
- (b) In the case of any *one* method of preserving food, explain briefly why decay does not occur in preserved food.
- (c) A group of students made the following recordings of plants in early spring when they investigated two areas of a lawn, one showing vigorous growth, the other poor growth.

Plants	Area of lawn showing:	
	Vigorous growth	Poor growth
Perennial Ryegrass	present	present
Red Fescue grass	present	present
Daisy	absent	present
Clover	present	absent
Dandelion	absent	present

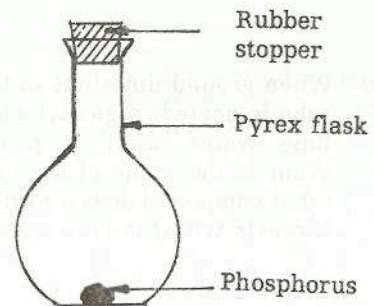
How would you explain their conclusion that clover was responsible for the vigorous growth and suggest reasons for the absence of daisy and dandelion plants in one of the areas?

8. (a) State, giving a reason for your answer, whether each of the following represents a physical or chemical change:
melting butter; mixing together sulphur and iron filings; heating bluestone (copper sulphate); burning wood.

- (b) When a length of magnesium ribbon was burned in a partly covered crucible, the mass increased by 0.4 g. Name the new compound formed and say what effect it would have on moist blue and moist red litmus paper.

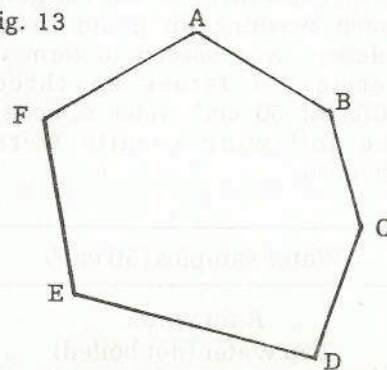
- (c) State how you would examine what happens when the small piece of phosphorus is heated in the sealed flask as shown in the diagram Fig. 12.

Fig. 12



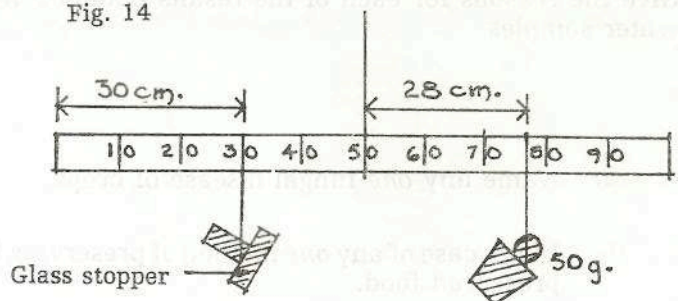
9. (a) How would you find the centre of gravity of a flat piece of cardboard with a shape like that shown in the diagram, Fig. 13?

Fig. 13



- (b) This uniform metre stick diagram Fig. 14 is balanced when suspended by a thread at the mid-point. Calculate the mass of the glass stopper.

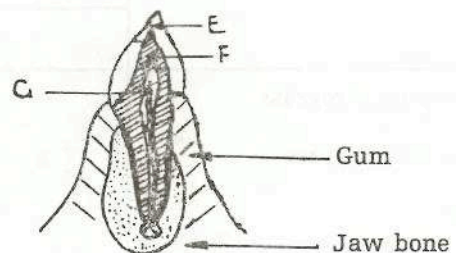
Fig. 14



- (c) A crane lifts 1000 kg up to a height of 25 metres. What force is exerted by the crane?

- 10 (a) Name the parts of the tooth marked E, F and G on the diagram Fig. 15.

Fig. 15



- (b) How does regular brushing and cleaning of the teeth with a toothbrush and toothpaste help to prevent tooth decay?

- (c) A portion of white bread was placed in each of two separate test tubes. Pure water was added to one tube and a mixture of saliva and water to the other. After half an hour the contents of each tube were filtered and the separate filtrates tested for the presence of starch and glucose. Explain the results you would expect to get in each test tube.