№ 08128

AN ROINN OIDEACHAIS

INTERMEDIATE CERTIFICATE EXAMINATION, 1988

SCIENCE — SYLLABUS E

WEDNESDAY, 15 JUNE — MORNING, 9.30 to 12.00

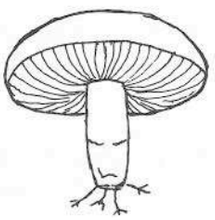
Answer question 1 and five other questions.
All questions carry equal marks.

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

(*a*) Name the three primary light colours.

(*b*) To what group of plants does the organism in Fig. 1 belong?

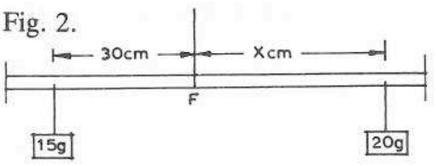
Fig. 1.



(*c*) Name three constituents of the blood.

(*d*) Fig. 2 shows a lever in equilibrium. Calculate the value of X.

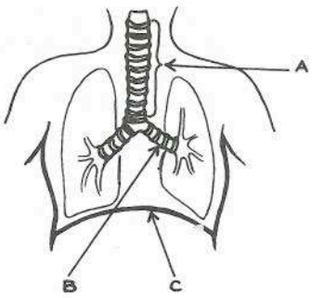
Fig. 2.



(*e*) Which of the following trees are deciduous: ash, pine, holly, oak, spruce?

(*f*) Which gases are exchanged in respiration?

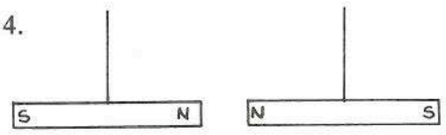
Fig. 3.



(*g*) Fig. 3 shows the human respiratory system. Name the parts marked **A, B, C.**

(*h*) Name *two* allotropes of carbon.

Fig. 4.



(*i*) What would happen if the two suspended magnets, in Fig. 4, were brought close together?

(*j*) What is the function of the kidneys?

(*k*) If the glass in Fig. 5 is carefully inverted, the water remains in the glass. Explain why this happens.

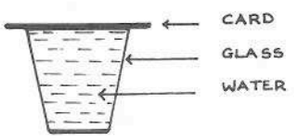


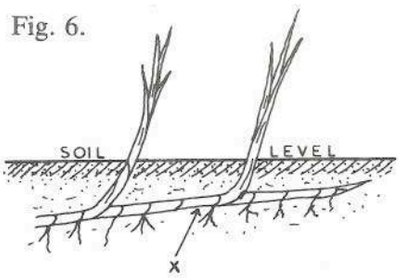
Fig. 5.

(*l*) What information does the Atomic Number of an element provide?

(*m*) Give an example of light being used as a source of energy.

(*n*) Identify the part of the plant marked **X** in Fig. 6.

Fig. 6.



(*o*) Why will a needle float on the surface of water?

2. (*a*) (i) What does the pH scale measure?

(ii) How would the addition of lime affect the pH of soil?

(*b*) Study Fig. 7.

(i) Name the process.

(ii) Name the piece of the apparatus labelled **A**.

(iii) What would the temperature of the mixture in the flask be when alcohol starts to collect in the beaker?

(*c*) A chemical reaction takes place when sodium hydroxide is titrated with hydrochloric acid.

(i) What name is usually given to this type of reaction?

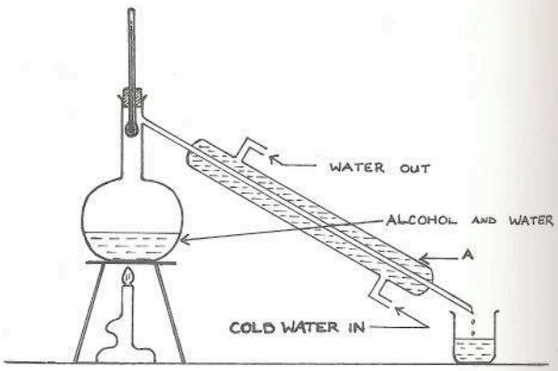
(ii) What indicator would you use?

If the solution is evaporated to dryness, a white crystalline solid is formed.

(iii) Name the crystalline solid produced.

(iv) Write down the chemical equation for the titration.

Fig. 7.



3. (*a*) Name *two* types of joints found in the human body and give one example of each type.

(*b*) (i) Name *five* of the parts of the heart labelled **A**, **B**, **C**, **D**, **E**, **F**, **G** in Fig 8.

(ii) State the differences between *arteries* and *veins*.

(iii) What is the function of the *white corpuscles* in blood?

(*c*) The chart Fig. 9 shows the heartbeat rate for two people **A** and **B** before and after exercise.

(i) Which person is the fitter?

(ii) Give reasons for your answer.

(iii) Explain how we breathe (i.e. the Breathing Mechanism).

Fig. 8.

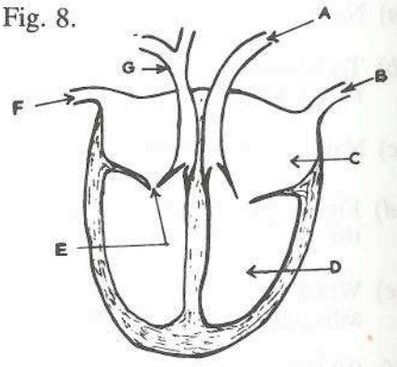


Fig. 9.

	Heart Beat/Min.	
	Before Exercise	After Exercise
A	60	90
B	80	130

4. (*a*) The diagram Fig. 10 shows a cross-section of a leaf.

(i) Identify cells **A** and **B**.

(ii) What is the function of the opening marked **C**?

(*b*) (i) Name the process by which a plant absorbs water and nutrients from the soil.

(ii) Describe an experiment to demonstrate this process. Illustrate your answer with a sketch.

(*c*) (i) In the diagram Fig. 11, which condition for photosynthesis is being investigated?

(ii) Name one other condition necessary for photosynthesis.

(iii) What energy rich compound does the plant make during photosynthesis?

(iv) Describe a test to show the presence of this compound in a leaf.

Fig. 10.

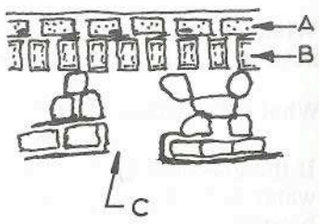
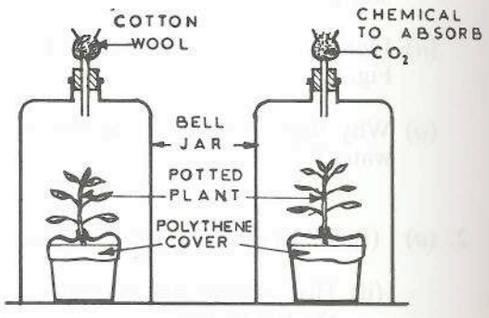


Fig. 11.



5. (*a*) What happens when the bimetallic strip in Fig. 12 is heated? Explain why this change occurs.

(*b*) (i) What is meant by the term "heat insulation".

(ii) List *four* examples of heat insulators found in the home or school.

(iii) How do mammals insulate themselves?

(*c*) (i) The cylinder in Fig. 13 was heated with a low flame for a few seconds. Against which part of the cylinder was the paper charred? Explain your answer.

(ii) Explain why ice first forms on the surface of a lake and not on the bottom.

Fig. 12.

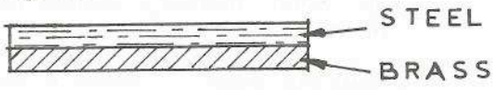
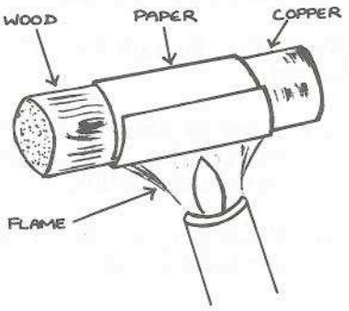


Fig. 13.



6. (*a*) Distinguish between an *annual* and a *biennial* plant and give one example of each.

(*b*) (i) Describe an experiment to demonstrate the process of transpiration in plants.

(ii) Sketch the apparatus used.

(*c*) (i) By what characteristics can an insect be recognised?

(ii) Describe the life-cycle of a named insect.

(iii) Name two insects which are useful, and two which are harmful, to us.

7. (*a*) (i) Name *two* major causes of water pollution in Ireland.

(ii) Explain how *one* of these pollutants affects aquatic life.

(*b*) An experiment was carried out to investigate the water loss from a plant. The apparatus in Fig. 14 was weighed every day and the results are shown in Table below.

Day	1	2	3	4	5	6
Weather	mild calm	cool cloudy calm	warm windy	sunny calm	mild calm	mild windy
Loss in mass/g	14	10	30	20	14	18

(i) What would you use as a control in this experiment?

(ii) Why was the pot covered with a polythene bag?

(iii) On which day did the plant lose most mass?

(iv) Explain why it was on this particular day.

(*c*) Answer the following referring to a habitat which *you* have studied:

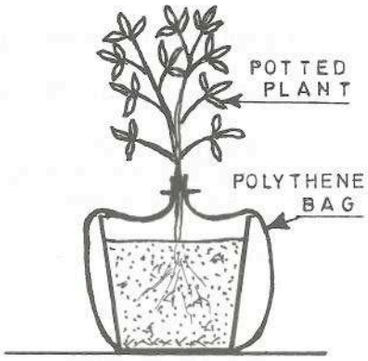
(i) Construct a food chain with four links.

(ii) List some of the adaptations which the plants have to propagate themselves.

(iii) Name two herbivores and two carnivores which you found.

(iv) Explain how the animals and plants of the habitat are interdependent.

Fig. 14.



8. (*a*) (i) Which of the following are compounds: air, water, mercury, sodium chloride, brass?

(ii) State one difference between a mixture and a compound.

(*b*) (i) Describe how you would prepare and collect a sample of hydrogen gas.

(ii) Sketch the apparatus you would use.

(*c*) Study the diagram Fig. 15 of an electrical circuit.

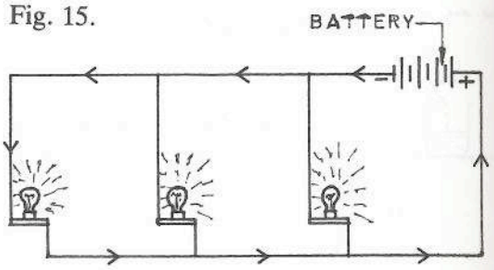
(i) If one of the bulbs is removed from its socket, what affect, if any, will this have on the other bulbs?

(ii) What purpose does a fuse serve in an electrical circuit?

(iii) At what voltage is electricity supplied to the home?

(iv) An electric light was left on for 20 hours and the cost of electricity used was 20 p. If electricity costs 8 p per unit, what was the wattage of the bulb?

Fig. 15.



9. (*a*) Three liquids which do not mix, are shaken together and allowed to settle as in Fig. 16.

(i) Which liquid has the lowest density?

(ii) If liquid Y is water, suggest a possible density for liquid Z.

(*b*) (i) Draw a diagram of an instrument used to measure the humidity of air.

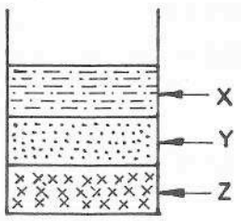
(ii) Explain how this instrument works.

(*c*) (i) State Archimedes Principle.

(ii) An object weighed 12 N in air, 10 N in water and 9 N in a liquid **A**. Calculate the relative density of **A**.

(iii) Name an instrument used to measure the relative density of a liquid.

Fig. 16.



10. (*a*) (i) What is a *parasite*?

(ii) Give two examples.

(*b*) (i) Outline the difference to be found between flowers which depend on wind pollination and those which depend on insect pollination.

(ii) Why do plants cross pollinate?

(iii) Explain the terms *fertilisation* and *fruit*.

(*c*) (i) Explain the terms *dominant* and *recessive*.

(ii) In mice the gene B (black) is dominant over the gene b (chocolate).
If two mice (both Bb) are crossed, give with the aid of a diagram, (*a*) the genotypes, (*b*) the phenotypes of the offspring.

(iii) Give two reasons why gardeners use hybrid F_1 seeds.