

AN ROINN OIDEACHAIS

INTERMEDIATE CERTIFICATE EXAMINATION, 1983

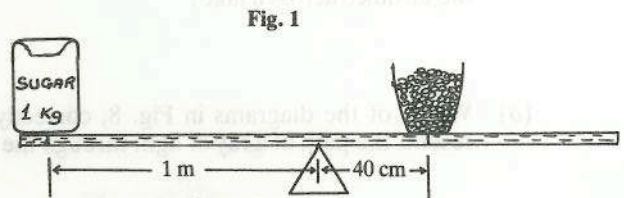
SCIENCE—SYLLABUS E

TUESDAY, 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).

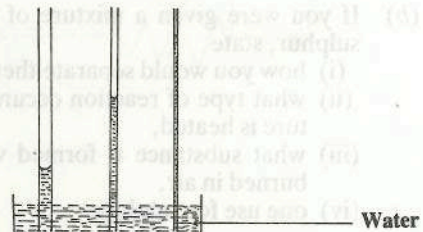
- (a) Where in the human body is hydrochloric acid produced?
- (b) To find the weight of a bowl of berries a girl set up the apparatus in the diagram Fig. 1.



What result did she get?

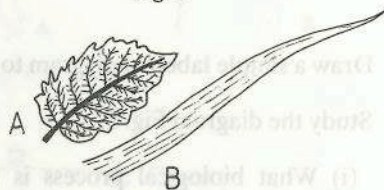
- (c) What part does a catalyst play in a chemical reaction?
- (d) What does the apparatus in the diagram Fig. 2 demonstrate?

Fig. 2



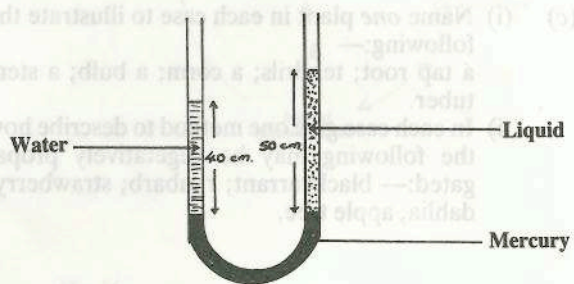
- (e) In the diagram Fig. 3, which of the leaves A or B is from a dicotyledon plant?
- (f) What biological process does the following reaction represent:—
carbon + oxygen → carbon dioxide + water + energy?

Fig. 3



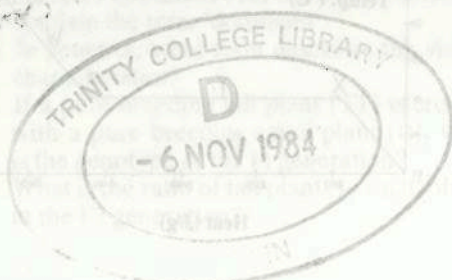
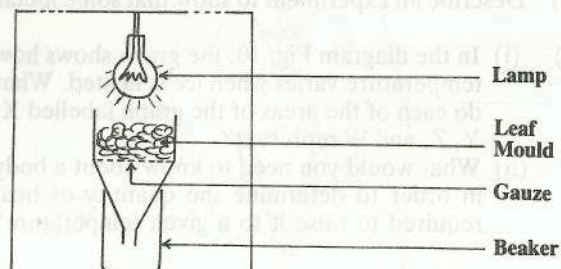
- (g) In the diagram Fig. 4, what is the specific gravity of the liquid in the U-tube?
- (h) What substance is responsible for the difference in nutrition between green plants and fungi?

Fig. 4

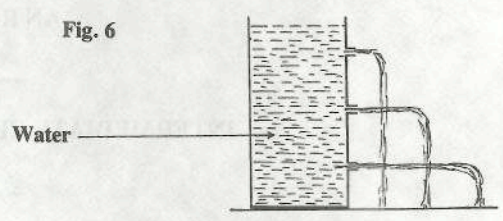


- (i) In the diagram Fig. 5, what collects in the beaker?

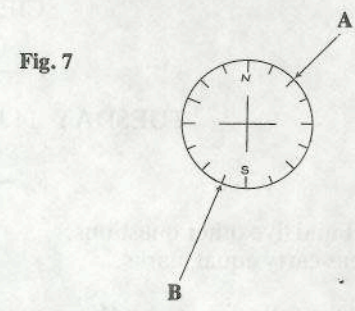
Fig. 5



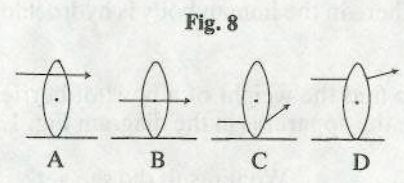
- (j) State the principle which the experiment in the diagram Fig. 6, demonstrates.
- (k) A taut spiral spring is extended 10 cms. when a 5 gram mass is attached to it. What mass will extend the spring 4 cm?



- (l) What gas is readily soluble in water and forms an alkaline solution?
- (m) What are the directions indicated by the arrows A and B in the diagram of the compass Fig. 7?
- (n) Given the velocity of sound, how would you measure the distance across a lake?

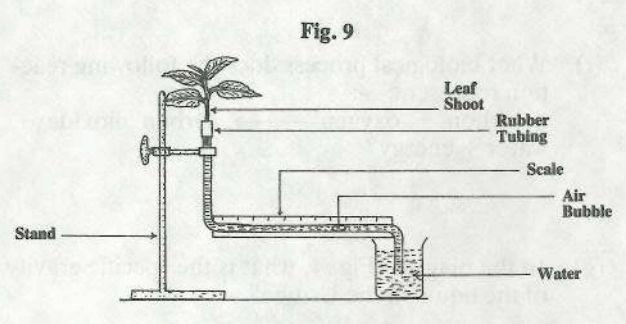


- (o) Which of the diagrams in Fig. 8, correctly represents the path of a ray of light through the lens?

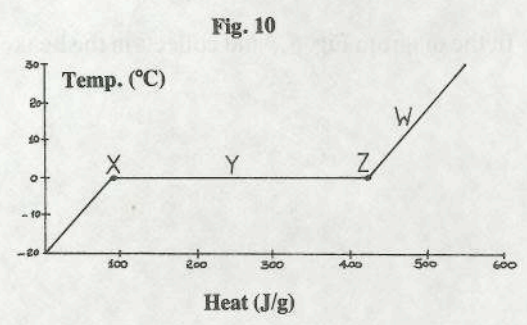


2. (a) Name *two* chemical elements which are necessary for plant growth.
- (b) If you were given a mixture of iron filings and sulphur, state
 (i) how you would separate them,
 (ii) what type of reaction occurs when the mixture is heated,
 (iii) what substance is formed when sulphur is burned in air,
 (iv) one use for sulphur.
- (c) For centuries water was regarded as an element. Describe any one experiment to show that water is, in fact, a compound.

3. (a) Draw a simple labelled diagram to show the main external features of a typical flowering plant.
- (b) Study the diagram Fig. 9.
 (i) What biological process is this apparatus being used to demonstrate?
 (ii) What is the purpose of the air bubble?
 (iii) What would be the effect of placing an electric fan near the leafy shoot?
- (c) (i) Name *one* plant in each case to illustrate the following:—
 a tap root; tendrils; a corm; a bulb; a stem tuber.
 (ii) In each case give one method to describe how the following may be vegetatively propagated:— blackcurrant; rhubarb; strawberry; dahlia; apple tree.



4. (a) For what is the German scientist Gabriel Fahrenheit famous?
- (b) Describe an experiment to show that some metals are better conductors of heat than others.
- (c) (i) In the diagram Fig. 10, the graph shows how temperature varies when ice is heated. What do each of the areas of the graph labelled X, Y, Z, and W represent?
 (ii) What would you need to know about a body in order to determine the quantity of heat required to raise it to a given temperature?



5. (a) Name the constituents of blood.
- (b) The diagram Fig. 11, shows part of the circulatory system.
- What type of blood vessels are marked A and D?
 - Name the parts labelled B and X.
 - What type of blood is carried in the blood vessel F?
- (c) A person had his pulse rate and body temperature checked during certain activities. The results obtained are shown in the table Fig. 12. Which *two* results in this table would you expect to be wrong? Give a reason for your answer in each case.

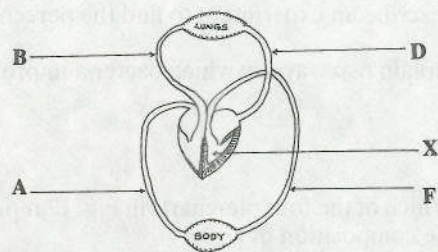


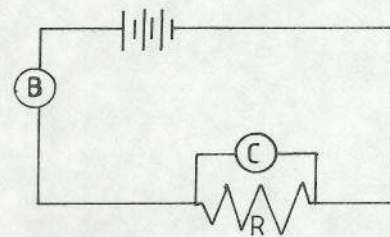
Fig. 11

Fig. 12

Activity	Pulse Rate/Minute	Body Temp. (°C)
Resting	66	37.0
Walking	85	37.1
Running	165	37.3
Sleeping	99	36.9
Writing	70	32.0

6. (a) If a bar magnet is placed on a piece of cork floating on water, in what direction will it point when it comes to rest?
- (b) If you are given a bar magnet, a piece of light cardboard and iron filings, describe how you would show the lines of magnetic force about the magnet. Draw a diagram of the result.
- (c) Study the experimental circuit in the diagram Fig. 13.
- What instruments do each of the letters B and C represent?
 - Calculate the resistance, R, if the reading in B is 2 and the reading in C is 10.

Fig. 13

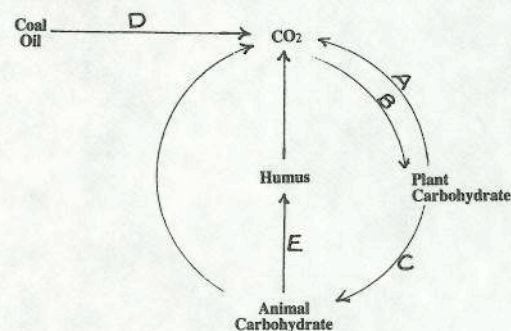


7. (a) Study the diagram Fig. 14.
- In what kind of habitat would you expect to find bird A?
 - What type of food would you associate with bird B?
- (b) In your study of ecology, name *two* investigations which involved the use of a metre quadrat frame. In the case of any *one* of the investigations you name, describe exactly how it was carried out.

Fig. 14

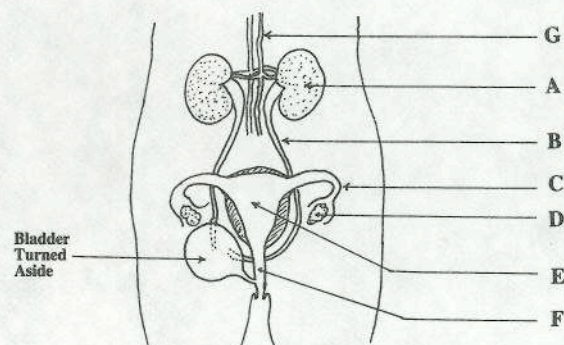


Fig. 15



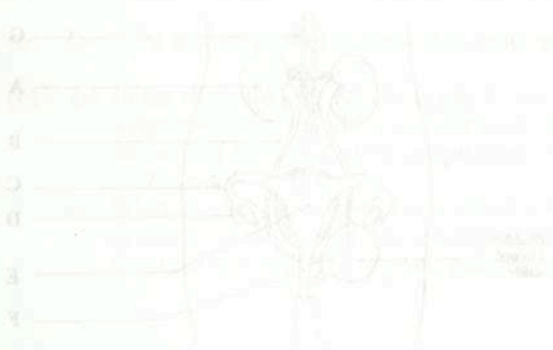
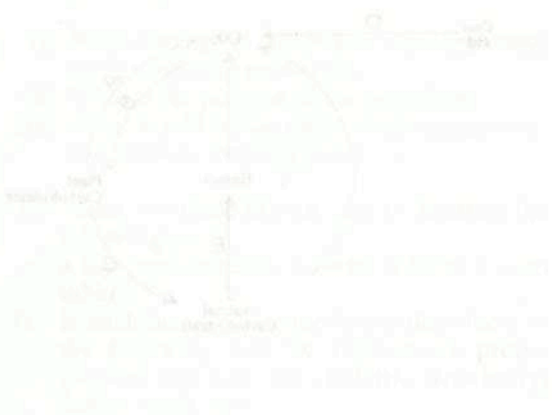
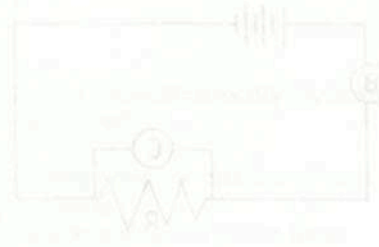
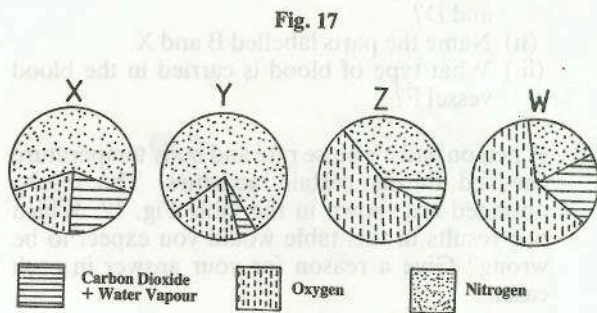
8. (a) Give two similarities between plants and animals.
- (b) The diagram Fig. 16 shows the female reproductive and urinary systems. Name any *five* of the parts labelled A, B, C, D, E, F, G.
- (c) In a breeding experiment with pea plants, tallness is found to be dominant over the dwarf character.
- Explain the term 'dominant'.
 - In genetics, what term describes the visible characteristics?
 - If a pure breeding tall plant (TT) is crossed with a pure breeding small plant (tt), what is the genotype of the F₁ generation? What is the ratio of tall plants to small plants in the F₂ generation?

Fig. 16



9. (a) Name *four* constituents of a normal fertile soil.
 (b) Describe an experiment to find the percentage water in a sample of soil.
 (c) Explain *two* ways by which bacteria improve the fertility of soil for plants.

10. (a) Which of the four pie-charts in Fig. 17 represents the composition of air?
 (b) Describe how you would prepare and collect a sample of oxygen.
 (c) (i) What factors keep the composition of air reasonably constant?
 (ii) What factors are responsible for changes in the pressure of the atmosphere?



- (a) If a bar magnet is placed on a piece of cork floating on water, in what direction will it point when it comes to rest?
- (b) If you are given a bar magnet, a piece of light cardboard and non-ferrous filings, describe how you would show the lines of magnetic force about the magnet. Draw a diagram of the result.
- (c) Study the experimental circuit in the diagram Fig. 17.
- (i) What instruments do each of the letters B and C represent?
- (ii) Calculate the resistance, R, if the reading in B is 2 and the reading in C is 10.
- (a) Study the diagram Fig. 14.
- (i) In what kind of habitat would you expect to find bird A?
- (ii) What type of food would you associate with bird B?
- (b) In your study of ecology, name two investigations which involved the use of a metre quadrat frame. In the case of any one of the investigations you name, describe exactly how it was carried out.
- (c) The diagram Fig. 15 gives an outline of the carbon cycle in nature. What events are represented by the arrows labelled A, B, C, D, and E?
- (a) Give two similarities between plants and animals.
- (b) The diagram Fig. 16 shows the female reproductive and urinary systems. Name any two of the parts labelled A, B, C, D, E, F, G.
- (c) In a breeding experiment with pea plants, tallness is found to be dominant over the dwarf character.
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