

AN ROINN OIDEACHAIS

INTERMEDIATE CERTIFICATE EXAMINATION, 1974

SCIENCE—SYLLABUS B

B

THURSDAY, 20 JUNE—AFTERNOON, 2 to 4.30

Six questions in all to be answered, including at least **two** from Section I, at least **one** from Section II and at least **one** from Section III. All questions carry equal marks.

SECTION I

1. (a) Give one example of a plant which has one of the following vegetative parts:—
bulb, stem tuber, corm, rhizome.
(b) Describe the method by which the plant you name is propagated.
(c) State whether the example you give is classified as annual, biennial or perennial.
2. (a) Use examples to describe any **two** methods by which seeds are naturally dispersed.
(b) Describe, with the aid of sketches, an experiment you would set up to investigate the conditions most suitable for the germination of seeds.
(c) Explain what is meant by dormancy in seeds.
3. (a) Describe, with the aid of sketches, a simple experiment to find out if micro-organisms are present in a given sample of soil.
(b) Explain any **two** of the terms:—
disinfectant, antibiotic, sterilization, pasteurization.
Give one example of the use of each from everyday life.
(c) Name any preserved food and outline briefly the various steps in the method used to preserve it.
4. (a) How would you investigate the action of saliva on starch foods.
(b) From the following foods select **three** which are rich in protein:—
fish, potatoes, bread, peas, cheese, glucose.
(c) What is the importance of protein in the diet of young animals?
(d) Describe briefly how atmospheric nitrogen becomes available to the growing plant by natural methods.
5. The drawing shows a beetle in a glass tube. The gases named in the table were passed through the tube and in each case the breathing rate of the beetle was recorded.



Gas	Breathing rate (per min.)
Air from room	28
Exhaled air	39
Carbon dioxide (CO ₂)	54
Oxygen (O ₂)	18

- (a) What in your opinion was the purpose of the experiment?
- (b) What conclusions do you draw from the experiment?
6. (a) State what is meant by an inherited characteristic and give one example.
(b) Explain what is meant by dominant characteristics. Give two examples.
(c) Write a short note on chromosomes.

SECTION II

7. (a) State the approximate composition of air.
(b) Select **one** of the gases you have mentioned under (a) above and describe how you would prepare and collect a sample of it in the school laboratory.
(c) State in what way the gas you have selected is of use to living organisms.
(d) What are the factors which help to keep the composition of the air reasonably constant?

8. (a) Name any **four** elements which are necessary for plant growth and which are commonly added to the soil in the form of fertilizer.
- (b) It was found that a sample of soil from the school garden had a pH of 5. What does this mean?
- (c) Each of the solutions in three test tubes, *A*, *B* and *C* were tested with red and blue litmus paper and the results are given in the following table.

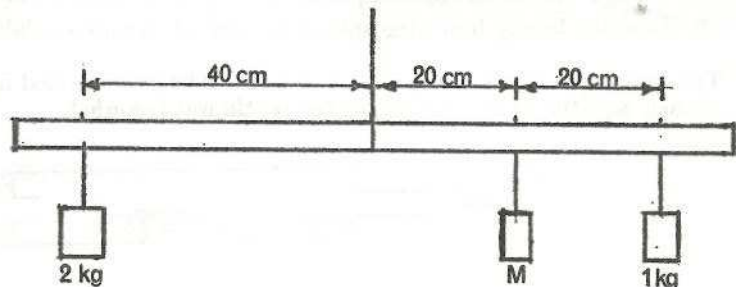
Colour of paper	<i>A</i>	<i>B</i>	<i>C</i>
Red	Turns blue	No change	No change
Blue	No change	No change	Turns red

What does this tell you about the solutions in *A*, *B* and *C*?

- (d) A sample of a colourless liquid was thought to be pure water. How would you verify this opinion?
9. Answer any **four** of the following.
- (a) What is a chemical reaction? Give an example.
- (b) State what is meant by each of these terms:— *evaporation, boiling, diffusion, osmosis*.
- (c) Use examples to illustrate what you understand by 'combustion'.
- (d) How would you show that exhaled air is different from inhaled air?
- (e) What is meant by hard water? Describe how you would get rid of temporary hardness in water.

SECTION III

10. (a) What is meant by the statement that the specific heat capacity of copper is $400 \text{ J/kg}^\circ\text{C}$.
- (b) You are given a number of metal rods which are identical in shape and size. Describe an experiment which would help you to arrange them in the order of their ability to conduct heat.
- (c) When a person wearing glasses enters a greenhouse, a mist sometimes appears on his glasses, but it disappears again. Why?
- (d) Explain why frost does good to the soil.
11. (a) Name the primary colours and state why they are so called.
- (b) Explain why a straight stick partly dipped in water appears to be bent.
- (c) Explain, with the aid of a sketch, how a $90^\circ\text{--}45^\circ$ prism may be used as a reflector.
- (d) Describe briefly the various ways in which man benefits from the energy of the sun.
12. (a) When a block of wood was dropped into a certain liquid in beaker *A* it sank and when a similar block of wood was dropped into another liquid in beaker *B* it floated. Give an explanation.
- (b) A metre stick is suspended at its middle point and is balanced by masses on either side as shown in the sketch.



Calculate the mass *M*.

- (c) The sketch shows a simple mercury barometer.
- (i) What would happen if an air bubble was allowed to enter at the mouth of the tube. Explain your answer.
- (ii) What would be the approximate value of *h* under normal atmospheric conditions at sea level.
- (iii) What change in weather conditions would cause a decrease in the value of *h*?

