

DAY VOCATIONAL CERTIFICATE EXAMINATIONS, 1970

SCIENCE (SYLLABUS A)

MONDAY, 22nd JUNE - 2 - 4.30 p.m.

Answer any six questions from this paper
All questions carry equal marks

SECTION A - PHYSICS

1. (a) If you suspend a weight from a spiral spring, what happens to the spring ?
 (b) If you were given a spiral spring with a weight attached to it, some thread, a metre stick, a 250 gm and a 500 gm weight, describe step by step how you would use them and what measurements you would make to show that the extension of the spring is proportional to the load applied to it.
 (c) If a 15 gm weight produces an extension of 3 cm in a spiral spring, what extension will a 30 gm weight produce ?
 (d) Name two uses to which a spiral spring can be put in everyday life.

2. (a) A cold metal ball can just slip through a ring, but if the ball is heated it can not slip through. Explain why.
 (b) Describe what apparatus you would use and what you would do to show that, (i) liquids, and (ii) gases expand when heated.
 (c) Draw a diagram of a thermometer. Name and label each part.
 (d) Why are there gaps between the sections of track in a railway line ?

3. (a) What will happen if you suspend a bar magnet horizontally by a piece of thread ?
 (b) If you were given a bar magnet say what apparatus you would need and what you would do to show:-
 (i) that lines of force exist around a magnet and,
 (ii) how these lines may be traced on a sheet of paper.
 (c) What metal is usually used to make a bar magnet ?
 (d) Describe, briefly, two uses you could make of a bar magnet.

4. Answer any two of the following:-
 (a) What is the atmosphere ? Describe an experiment to show that the atmosphere exerts pressure.
 (b) Explain why smoke from a fire goes up the chimney. How would you show that a convection current is set up when a gas is heated ?
 (c) Describe, with the help of a diagram, a Leclanché cell. Is electricity formed or is it stored in a Leclanché cell ? Give one reason for your answer.

SECTION B - CHEMISTRY

5. (a) From the following list name two elements and two compounds:-
 copper sulphate, iron, milk, calcium chloride, concrete,
 magnesium, ink, zinc, water.
 (b) If you were given some sea-water describe what apparatus you would need to prepare a sample of pure water from it. What happens in the apparatus as pure water is being produced ?
 (c) Name the method of purification you have described.
 (d) Is drinking water pure water ? Give two reasons for your answer.

6. (a) How would you show that air contains oxygen ?
 (b) Describe the apparatus you would need and the method you would use to show that oxygen occupies about one fifth ($\frac{1}{5}$) of the volume of a sample of air.
 (c) What gas occupies the greatest volume in a sample of air ?
 (d) Describe, briefly, two uses of oxygen in industry.
7. (a) In chemistry what is meant by an indicator ?
 (b) Given samples of dilute hydrochloric acid and dilute sodium hydroxide describe the apparatus needed and how you would use it to prepare a sample of sodium chloride.
 (c) If you were given a sample of a liquid how would you show whether or not it is an acid ?
 (d) Name an industry which uses nitric acid.
8. Answer any two of the following:-
 (a) What are the chemical symbols for:
 Hydrogen, Oxygen, Magnesium, Calcium.
 Put the following statements into the form of chemical equations:-
 (i) When magnesium is burned in oxygen the product is magnesium oxide.
 (ii) When calcium is put into water, the products are calcium hydroxide and hydrogen.
 (b) What substances would you use to make carbon dioxide ? How would you show that there is carbon dioxide in the air ?
 (c) What is an atom ? Name the chief particles found in an atom.
 If an atom has fifteen electrons, draw a diagram of the way they are arranged.

SECTION C - BIOLOGY

9. (a) What is a habitat ?
 (b) In one habitat you have studied describe briefly:-
 (i) its general appearance;
 (ii) where you found the plants and animals in it;
 (iii) how you collected these plants and animals.
 (c) Name five plants and five animals you found in this habitat.
 (d) What changes did you notice in the habitat as the seasons passed from winter to summer or from summer to winter ?
10. (a) Name three functions of the root of a common flowering plant.
 (b) The root forces water and nutrients up into the stem of the plant. What apparatus would you need and how would you use it to show that the root exerts this pressure ?
 (c) Name three plants in which food is stored in the root.
 (d) Some plants which live in a habitat where they find it difficult to exist have roots adapted so that they can continue to function. Name one plant with adapted roots and sketch the type of root it has.
11. (a) What use does a mammal make of the oxygen he breathes in ?
 (b) Describe an experiment to show that the air which a mammal breathes out has more carbon dioxide in it than the air which it breathes in.
 (c) In a simple sketch show where the following are situated in any mammal:-
 (i) the lungs,
 (ii) the rib-cage,
 (iii) the diaphragm.
 (d) Why can a mammal live for only a short time under water ?
12. Answer any two of the following:
 (a) Why will a piece of meat go bad if it is left exposed to the air ? State what you would do to prevent the meat going bad.
 (b) Under what conditions will a seed germinate ? Describe an experiment to show that a germinating seed does not need a food supply.
 (c) Why must the blood of an animal always be circulating ? Show and name the parts of the heart on a labelled diagram, and use arrows to indicate the direction of blood flow inside the heart.