

DAY VOCATIONAL CERTIFICATE EXAMINATION, 1980

SCIENCE (SYLLABUS A)

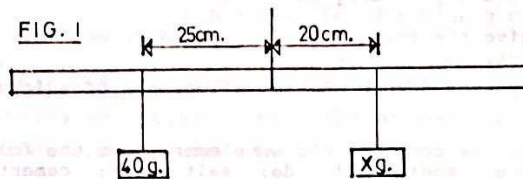
TUESDAY, JUNE 10, 2-4.30 p.m.

INSTRUCTIONS

- (a) Answer any six questions from this paper.
(b) All questions carry equal marks.

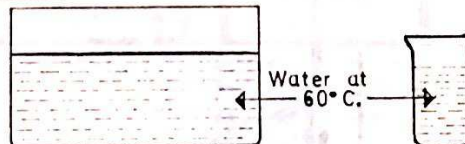
SECTION A - PHYSICS

1. (a) What is a force? Describe *two* examples of force from everyday life.
(b) If a mass of 20 grams causes a spiral spring to extend by 5 cm, by how much would a mass of 30 grams extend the same spring?
(c) (i) State the Principle of Moments.



- (ii) Figure 1 shows a uniform metre-stick suspended at its mid-point. An object of mass 40 grams suspended at a point 25 cm from the mid-point is balanced by a mass of X grams suspended at a point 20 cm from the mid-point. Calculate X.
(iii) What would happen to the metre-stick if the 40 grams object were brought closer to the mid-point?
(d) Give an example of 'action and reaction'.
2. (a) What is meant by the temperature of an object?

FIG. 2



- (b) The containers in Fig. 2 each contain water at 60°C. Which (if any) contains the greater amount of heat?
(c) Describe an experiment which shows that water is a poor conductor of heat.

FIG. 3



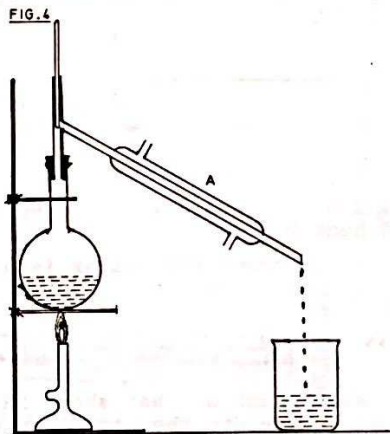
- (d) If a compound bi-metal strip such as that shown in Fig. 3 were heated over a bunsen burner what would happen to the strip and why?
3. (a) How would you electrically charge (i) a glass rod, (ii) a plastic rod e.g. a biro? What kind of charge would each rod have?
(b) Explain what happens when a charged rod is brought near the top of a gold leaf electroscope.
(c) What will happen to a bar magnet if it is suspended horizontally by a piece of thread?
(d) Describe an experiment to show the lines of force around a bar magnet.

OVER +

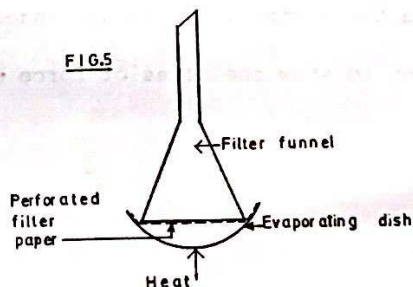
4. Answer ~~eight~~ ^{eight} of the following. Keep your answers short.
- Why are dark clothes unsuitable for hot climates ?
 - An object of volume 8 cm^3 weighs 56 grams. What is its density ?
 - Give two differences between electrons and protons.
 - What is meant by convection ?
 - In an electrical circuit the potential difference is 12 volts and the resistance 3 ohms. What current will flow ?
 - Name two different forms of energy.
 - What happens the pressure in car tyres after a long journey ? Explain your answer.
 - How would you show that air has weight ?
 - Explain why a pin which floats on ordinary water will not float on soapy water.
 - At what voltage does the E.S.B. supply electricity to your home or school ?
 - A car increases its speed from 25 feet per second to 35 feet per second in two seconds. Find its acceleration.
 - What is meant by the centre of gravity of an object ?

SECTION B - CHEMISTRY

- Name *two* substances you would use to prepare carbon dioxide in the laboratory.
 - Show with the aid of a diagram how you would carry out this preparation.
 - What test would you carry out to show that carbon dioxide had been prepared ?
 - What use do plants make of carbon dioxide ?
 - Name, or give the formula of a compound formed when carbon dioxide and water react.
 - Name *two* allotropes of carbon and *two* allotropes of sulphur.
- Name *one* mixture, *one* compound and *one* element from the following list:- Sodium; chlorine; sodium chloride; salt water; cement; sugar.
 - What happens when a piece of sodium is dropped into water ? Name two substances produced.
 - Name one other element in the same group as sodium which behaves in a similar way.
 - Describe the arrangement of the electrons in the atoms of the following elements. The element's number on the Periodic Table is given after each name. Sodium (11); calcium (20); carbon (6); oxygen (8).
- Describe the differences between a physical change and a chemical change. Give two examples of chemical changes.
 - Fig. 4 shows part of an apparatus which can be used for separating certain liquids.



- Name part A and explain how it works.
 - Name two liquids which could be separated in this way. What is the boiling point of each liquid ?
 - Which of the liquids would gather in the beaker first ?
- (c) Fig. 5 shows an apparatus for the separation of a mixture of ammonium chloride and sodium chloride. What happens when heat is applied ?



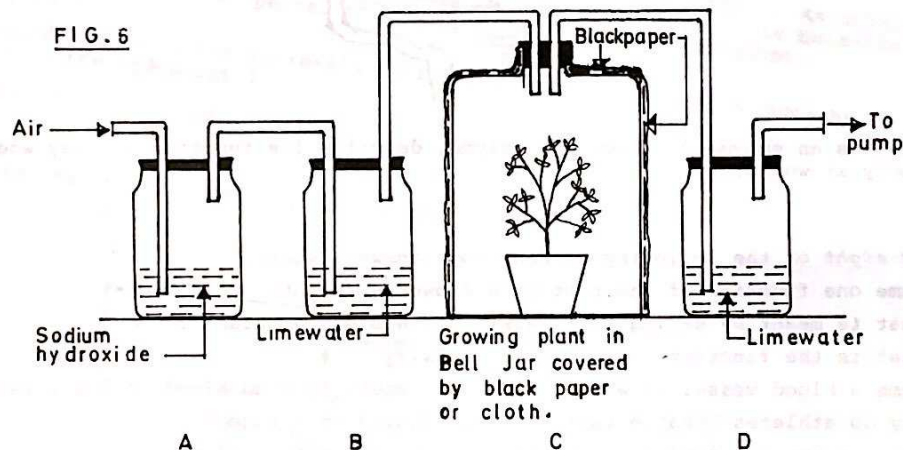
- (d) Name another substance which behaves similarly to ammonium chloride when heated.

8. Answer *eight* of the following items. Keep your answers short.
- Explain why the element neon (atomic number, 10) is inert.
 - Name the gas that relights a glowing splint.
 - Complete the following equation: $\text{Zn} + 2 \text{HCl} \longrightarrow$
 - The atomic number of aluminium is thirteen. What information does this give us about aluminium atoms?
 - Name two ionic (electrovalent) compounds.
 - What is the approximate percentage of nitrogen in the air?
 - What *two* conditions are necessary for rusting of iron to take place?
 - Write the following equation in words: $\text{S} + \text{O}_2 \longrightarrow \text{SO}_2$.
 - Name the gas which forms "steamy" white clouds on contact with hydrogen chloride.
 - Describe briefly how you would separate a mixture of different coloured inks.
 - What is a molecule?
 - What information is contained in the formula H_2O ?

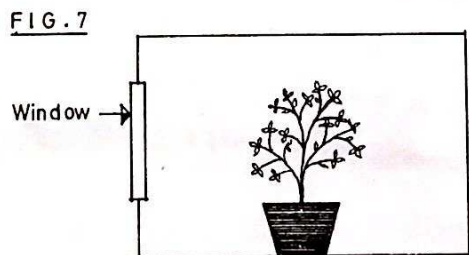
SECTION C - BIOLOGY

9. (a) Name two types of habitat. Describe *one* habitat you visited. (A detailed map or diagram is acceptable in place of a written description.)
- (b) Name *four* animals and *four* plants you found in the habitat you described. Show how one of the animals and one of the plants is adapted to life in the habitat.
- (c) Describe two food chains you found in the habitat you visited.
- (d) Explain the terms producer, consumer, herbivore.

10.



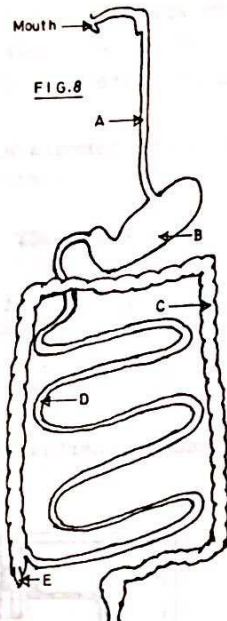
- (a) Fig. 6 shows an experiment carried out on a growing plant. Air is pumped through the various parts of the apparatus from left to right.
- What happens the limewater in Jar D?
 - What does this prove?
 - Why was the bell-jar covered with black cloth or paper?
 - What was the purpose of the lime-water in Jar B?
 - What was the purpose of the sodium hydroxide?
 - If a small animal were put into the bell-jar instead of the plant what would happen the lime-water in Jar D?
- (b) Fig. 7 shows a chamber with only one window in which a growing plant was placed. Describe or show by means of a diagram the direction of growth of the plant. Explain your answer.



- (c) Name any plant which does not make its own food.

11. (a) Name two uses animals make of the food they eat.
 (b) How would you show simply that a sample of food contains (i) carbon; (ii) starch?
 (c) Name the parts of the digestive system marked A, B, C, D, and E on the diagram in Fig. 8.

(a)
 (b)



- (d) What is an enzyme? Name one enzyme, describe its function and say where in the body it works.

12. Answer *eight* of the following. Keep your answers short.

- (a) Name one function of the root of a flowering plant.
- (b) What is meant by saying that parsley is a biennial plant?
- (c) What is the function of red blood cells?
- (d) Name a blood vessel in which you would expect to find blood at low pressure.
- (e) Why do athletes breathe faster after running in a race?
- (f) Mention any two conditions necessary for germination of seeds to take place.
- (g) Give one named example of a plant reproducing by means of (i) a stem tuber; (ii) a bulb.
- (h) Mention one way in which earthworms help improve the soil.
- (i) What are alveoli and where in the human body are they found?
- (j) Give the stages in the life cycle of *one* of the following - (i) frog, or (ii) butterfly.
- (k) Name *two* ways in which micro-organisms (bacteria, viruses, fungi) are useful to man.
- (l) Name two natural methods of seed dispersal.

