

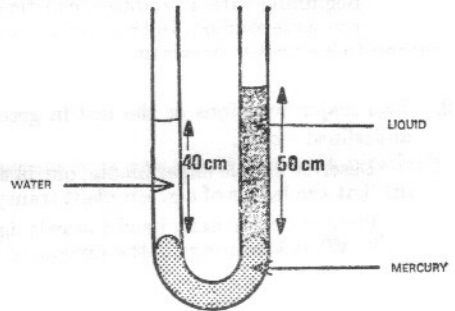
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SECTION A (See separate sheet for Sections B, C, D.)

Thirty items to be answered. All items carry the same marks. Write your answers in the spaces provided. Section A carries half the total marks for the paper. Be sure to return this Section of the examination paper: enclose it in the answer-book you use in answering Sections B, C, D.

- 1. A barometer is used to measure.....
- 2. What is meant by velocity?.....
- 3. State the law of conservation of energy

4. The diagram shows a column of water 40 cm high in one arm of a U-tube balanced by a column of liquid 50 cm high in the second arm of the U-tube. What is the relative density of the liquid?



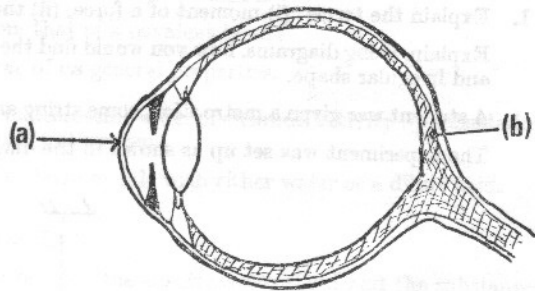
- 5. The pressure at a point in a liquid depends on
 - (i)
 - (ii)
- 6. State two advantages of mercury as a liquid in thermometers.
 - (i)
 - (ii)
- 7. State the relationship between the volume and the temperature of a definite mass of gas at constant pressure.
- 8. List two functions of a gold leaf electroscope.
 - (i)
 - (ii)
- 9. Define the specific latent heat of fusion of ice.
- 10. If a 15 g mass produces an extension of 3 cm in a taut spiral spring, what extension will a 10 g mass produce?

11. Heat may be transferred by conduction. Name two other methods of heat transfer.
- (i)
- (ii)
12. A current of 2 amperes flows through a wire when the potential difference between the ends of the wire is 12 volts. What is the resistance of the wire?
-
13. Name a substance that changes directly from a solid to a gas on heating.
-
- What is this process called?
14. Helium is an example of a monatomic element. Give the name or symbol of another example of a monatomic element.
-
- Chlorine is an example of a diatomic element. Give the name or symbol of another example of a diatomic element.
-
15. Air is a mixture of oxygen, nitrogen, inert gases, water vapour and carbon dioxide. What is the approximate percentage in air of
- (i) nitrogen
- (ii) oxygen
16. The separation of coloured substances by allowing them to move along blotting paper is called
-
17. State the shape of each of the following molecules.
- (i) hydrogen chloride
- (ii) methane
18. Two isotopes of carbon have atomic weights (atomic masses) of 12 and 14 respectively.
- (i) How many electrons are there in the isotope of carbon of atomic weight 12?
-
- (ii) How many neutrons are there in the isotope of carbon of atomic weight 14?
-
19. Write the electronic structures of
- (i) sodium
- (ii) potassium
20. What is a basic oxide? Give an example.
-
-
21. Write the chemical equation for the reaction of carbon dioxide with water.
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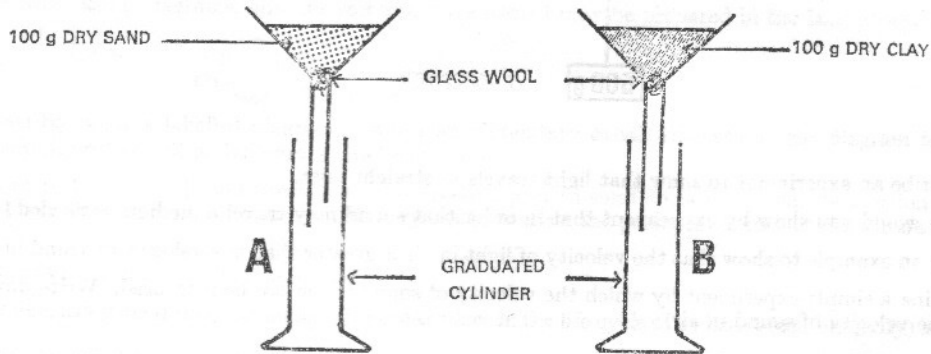
22. Chlorine gas (Cl_2) can be prepared by dropping concentrated hydrochloric acid on to crystals of
23. What is meant by an exothermic reaction?
.....
.....
24. What is an ion?
25. What is the function of xylem vessels (cells) in a vascular bundle?
.....
.....
26. Give *two* ways in which a plant cell differs from an animal cell.
(i)
(ii)
27. The response of a plant to
(i) gravity is called.....
(ii) water is called
28. Some leaves have a waxy, non-living layer on the surface of the leaf called the cuticle. What is the function of this layer?
.....
.....
29. Name any *two* conditions necessary for the germination of seeds.
(i)
(ii)
30. The male gamete or sperm is produced in the
The female gamete or egg is produced in the
31. Name *two* organs of excretion in the human body.
(i)
(ii)
32. Underline, in the following list, the correct number of chromosome pairs in the human body.
8 18 23 32 46
33. State *two* functions of blood.
(i)
(ii)

34. Label the following parts of the eye.

- (a)
- (b)



35. 100 cm³ of water was poured on to the contents of each funnel in the apparatus shown



The volume collected in cylinder A is greater than the volume collected in cylinder B.

Why?

.....

36. The human ear has two functions. State these functions.

- (i)
- (ii)

INTERMEDIATE CERTIFICATE EXAMINATION, 1981

SCIENCE—SYLLABUS A

A

TUESDAY, 16 JUNE - MORNING 9.30 to 12

Answer Section A and one question from each of the Sections B, C, D.

SECTION A

Section A is on a separate sheet which provides space for your answers. The completed sheet should be enclosed in your answer-book.

SECTIONS B, C, D

The questions from these sections should be answered in your answer-book.

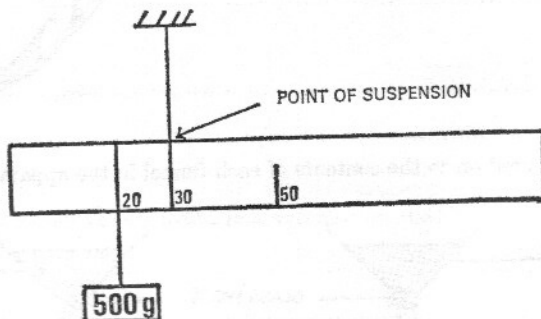
Answer one question from each Section. All questions carry the same marks.

SECTION B

1. Explain the terms: (i) moment of a force, (ii) the law of the lever, (iii) centre of gravity.

Explain, using diagrams, how you would find the centre of gravity of a sheet of cardboard of uniform thickness and irregular shape.

A student was given a metre stick, some string and a 500 g mass and asked to find the mass of the metre stick. The experiment was set up as shown in the diagram. Calculate the mass of the metre stick.



2. Describe an experiment to show that light travels in straight lines.

How would you show by experiment that in order that sound may travel a medium is needed?

Give an example to show that the velocity of light in air is greater than the velocity of sound in air.

Outline a simple experiment by which the velocity of sound in air can be measured. Write down the value of the velocity of sound in air.

3. (a) How could you show by experiment the magnetic effect of an electric current?

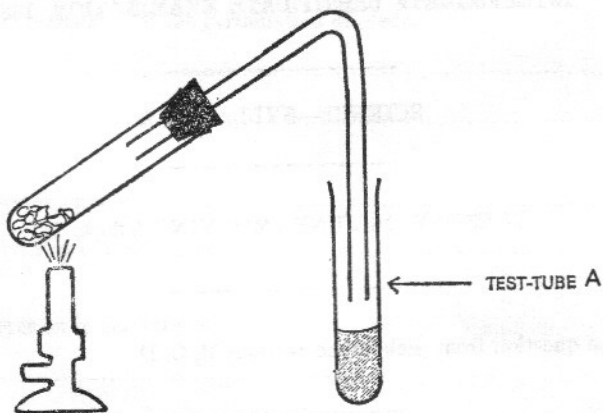
Using a labelled diagram show how the electric bell works.

- (b) Describe, with the aid of a labelled diagram, how a simple cell produces an electric current.

How much would it cost to run a 1 kW electric fire for 10 hours a day for three days at 5p per kilowatt hour?

SECTION C

4. (a) A student was given a test tube containing a quantity of a dark blue crystalline substance, some glass tubing, a Bunsen burner and a collecting test tube. The apparatus was set up as shown in the diagram.



On heating, the dark blue crystalline substance turned to a white coloured powder and a colourless liquid was collected in test tube A

What was

- the dark blue crystalline substance,
- the white coloured powder,
- the colourless liquid in test tube A?

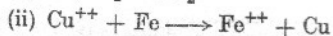
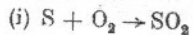
If the dark blue substance weighed 12 g at the start of the experiment and if the white coloured powder weighed 9 g at the end of the experiment, what was the percentage loss of weight?

- (b) What causes (i) temporary hardness, (ii) permanent hardness, in water?

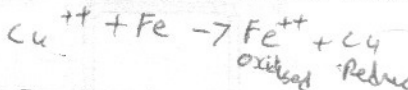
Outline a method for the removal of permanent hardness in water.

5. (a) Explain, with the aid of a suitable diagram, how a covalent bond is formed.
How does the formation of an ionic bond differ from that of a covalent bond?
Give an example of an ionic substance and state *one* of its general properties.
- (b) Arrange the metals magnesium, copper and sodium in decreasing order of chemical activity by considering their reaction (if any) with (i) water, (ii) a dilute acid, (iii) oxygen.
Name the products of the reaction of any *one* of the above metals with either water *or* a dilute acid.

6. (a) What is meant by reduction in terms of electron transfer?
In the case of the following reactions state, giving reasons, the substances oxidised and the substances reduced



- (b) What is a salt? Name a salt.
Describe, using diagrams, how the salt you have named may be prepared in the laboratory.



SECTION D

7. (a) Describe, using a labelled diagram, the human alimentary canal. Indicate on the diagram the regions where (i) protein, (ii) carbohydrate, are broken down.
- (b) Three test tubes A, B and C contain respectively a protein solution, a carbohydrate solution and a fat solution. Describe the tests you would carry out to confirm the presence of each of the three substances.
8. (a) What is the meaning of metamorphosis?
Outline, using diagrams, the changes that take place in the life cycle of an insect (e.g. butterfly) *or* of a frog.
- (b) What is meant by vegetative propagation?
A bulb consists of a small modified stem with fleshy leaves. Draw a diagram of a bulb and explain its function. State how this function is carried out.
9. (a) Describe how you would use (i) a Tullgren funnel, (ii) a quadrat, in your study of a habitat.
- (b) Explain the terms: competition, interdependence.
In the habitat you have studied describe the importance of competition and interdependence.
- (c) What is meant by a food chain? Give an example of a food chain of at least two consumers in your habitat.

oil
RigSO₂