Examination Number

AN ROINN OIDEACHAIS

INTERMEDIATE CERTIFICATE EXAMINATION, 1974

A

SCIENCE—SYLLABUS A

THURSDAY, 20 JUNE—AFTERNOON, 2 to 4.30

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.

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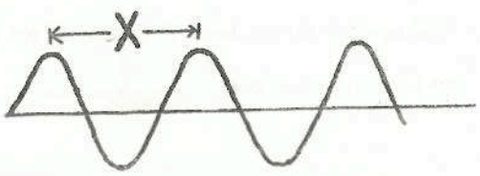
1. An electrically charged atom is called .....

2. The diagram represents a wave. What name is given to the distance *X*?



.....

3. "That which gives a body motion or alters its existing motion in magnitude or direction" is a definition of one of the following:

momentum force density velocity

Underline the correct one.

4. Name any good conductor of heat. .....

5. Mention any advantage which alcohol has over mercury as a thermometer fluid.

.....

6. Why is the heating element in an electric kettle placed as low as possible?

.....

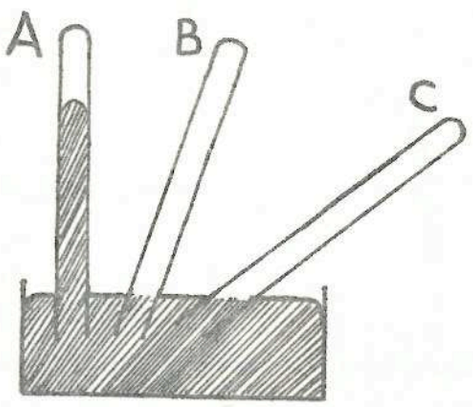
7. A current of 3 amperes flows through a wire when the potential difference between the ends of the wire is 24 volts. What is the resistance of the wire? .....

8. What is a magnetic line of force? .....

.....

9. The velocity of a racing car is increased uniformly from 20 metres per second to 50 metres per second in 3 seconds. What is the acceleration? .....

10. Mercury stands at the height shown in the barometer tube *A*. Mark in the height of the mercury when the tube is (i) in position *B*, (ii) in position *C*.



11. What colour will a white object appear when viewed under

(i) red light .....

(ii) a mixture of red and green lights? .....

12. The specific latent heat of fusion of ice is 336 kJ/kg. How much heat is required to melt 100 grams (0·1 kg) of ice at 0°C? .....

13. Name a gas which is lighter than air .....

14. Underline which one of the following represents the volume of nitrogen in the atmosphere:

0·03% 1% 21% 78%

15. To what family of elements do bromine and iodine belong? .....

16. The process by which coloured substances in a mixture may be separated by allowing a solution of the mixture to move along filter paper is called .....

17. Underline the non-metals in the following:

calcium chlorine iron nitrogen sodium

18. Name a white salt that sublimes on heating. .....

19. Germs in water are killed by adding the element .....

20. Name a gas which is readily soluble in water giving an alkaline solution. .....

21. Name the two substances formed when red hot magnesium ribbon and steam react.

....

22. Name two allotropes of carbon. ....

23. Fluorine has an atomic number 9 and an atomic weight (mass number) 19. How many neutrons in the atom of fluorine? .....

24. Complete the equation

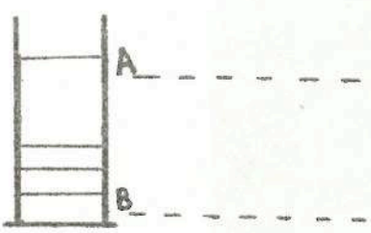
$$CH_4 + \quad O_2 = CO_2 +$$

25. Why is green pond weed often placed in fresh-water fish tanks?

.....

26. An animal that eats only vegetable matter is called .....

27. Some garden soil placed in water in a jar is shaken and allowed to settle (see diagram). Label *A* and *B*.



28. Indicate with an *X* which one of the following describes a saprophyte (e.g. mushroom):

It contains chlorophyll and makes its own food .....

It obtains its food from other living organisms .....

It obtains its food from dead organic matter .....

It is a good source of food for animals .....

29. Name one disease caused by a virus. .....

30. Red blood cells are formed in one of the following:

heart kidney bone marrow adrenal glands gall bladder.

Underline the correct one.

31. What gas is given off by germinating seeds? .....

32. Underline which of the following is the response of the root of a plant to gravity.

phototropism hydrotropism geotropism

33. What name is given to plants that live for several years? .....

34. What is the femur and where is it located in the human body?

....

35. Where is insulin produced in the human body? .....

36. The nerve which carries impulses from the retina to the brain is called the ..... nerve.

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INTERMEDIATE CERTIFICATE EXAMINATION, 1974

SCIENCE—SYLLABUS A

A

THURSDAY, 20 JUNE—AFTERNOON, 2 to 4.30

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. For a fixed mass of gas what is the relationship between (i) volume and pressure at constant temperature, (ii) volume and temperature at constant pressure?
Describe an experiment you would perform to illustrate either (i) **or** (ii).
For a fixed mass of gas, at a pressure of 760 mm of mercury, the volume is 500 cm^3. Calculate its volume at a pressure of 800 mm of mercury if the temperature remains the same.
In terms of moving molecules, state what happens when the temperature of a gas is raised.

2. (*a*) State the principle of Archimedes.
Show how the principle of Archimedes accounts for the following:—
(i) A tanker floats lower in river water than it does in sea water.
(ii) A fresh egg sinks in a beaker of water but if enough salt is added and stirred the egg will float.

(*b*) Draw a labelled diagram of a gold-leaf electroscope.
Show how the electroscope may be used to indicate if a given body is charged or not.

3. What is energy? What kind of energy is present (i) in a wound up spring of a clock, (ii) in a hammer striking a nail into a block of wood?
Heat, light and electricity are forms of energy. How could this be demonstrated in the case of any two of them?

SECTION C

4. (*a*) Give the name and formula for the compound formed when (i) carbon, (ii) magnesium, (iii) sulphur, is burned in oxygen. Describe the properties of each compound under the headings: state, colour, reaction, if any, with moist litmus.

   (*b*) What happens when dry hydrogen is passed over heated copper (II) oxide? What deduction may be made from this experiment?

5. (*a*) Three test tubes contain colourless liquids. One is known to contain dilute hydrochloric acid, another dilute sulphuric acid and the third dilute nitric acid. Describe a test you would perform, one in each case, to identify the three acids.

   (*b*) Use a clearly labelled diagram to show how you would prepare hydrogen using one of the acids mentioned above. Write an equation for the preparation.
   List the principal properties of hydrogen.

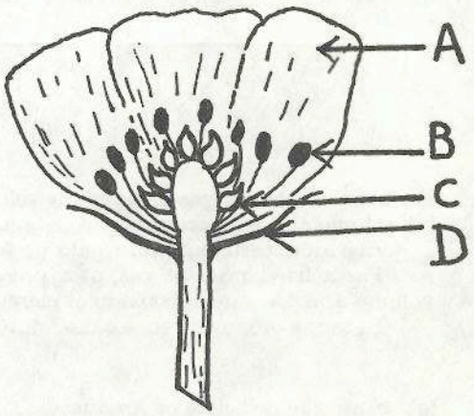
6. Answer any **two** of the following:—

   (*a*) Use a diagram to indicate the shape of a molecule of hydrogen chloride; refer to the type of bond in the molecule. Show also the structure of hydrogen chloride that has been dissolved in water giving hydrochloric acid and refer to the type of bonding.

   (*b*) Define oxidation in terms of transfer of electrons. Show that $Fe + S = FeS$ is an oxidation/reduction reaction and state what has been reduced.

   (*c*) Show by means of a diagram and an equation how an ion-exchanger softens hard water.

SECTION D



7. (*a*) What is the function of the flower? The diagram shows a section through the flower of a buttercup. Identify *A*, *B*, *C* and *D* and give one function of each. How may an insect (e.g. bee) help a flower such as this to fulfil its function?

   (*b*) Describe an experiment to show that light is necessary for photosynthesis.

8. (*a*) What is meant by digestion?
   Draw a labelled diagram to show the parts of the digestive system in man. Describe briefly what happens in each part.

   (*b*) What is an enzyme?
   Describe an experiment to show enzyme action.

9. Describe, with the aid of a map or diagram, a habitat you have studied as it appears during the month of May.
   What major changes are to be seen in the habitat in Winter?

   If the habitat you describe is terrestrial, outline how the amount of humus in the soil might be estimated. Give two reasons why humus is important.

   If the habitat you describe is aquatic, state how two named animals obtain their food in this habitat. Show briefly how one large floating plant is adapted for life in water.