M. 53(a)

Examination Number

AN ROINN OIDEACHAIS

INTERMEDIATE CERTIFICATE EXAMINATION, 1975

A

SCIENCE—SYLLABUS A

WEDNESDAY, 18 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.

1. An Olympic athlete runs 100 metres in 10 seconds. What is his average speed?.....

2. The pressure at a point in a liquid depends on:—

   (i) .....

   (ii) .....

3. When a body is weighed in air it balances a mass of 15 grams. When it is weighed in water it balances a mass of 10 grams.

   (i) What is the mass of the displaced water?.....

   (ii) What is the volume of the body?.....

4. Write down the relation between the pressure and volume for a given mass of gas at constant temperature.

   .....

5. "The specific heat capacity of copper is 390 J/kg °C". What does this mean?.....

   .....

6. Give one example of the generation of heat by mechanical work.....

   .....

7. State two advantages of mercury as a thermometer liquid.

   (i) .....

   (ii) .....

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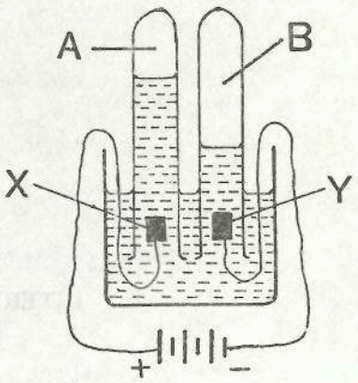
8. Name the gases A and B produced in the electrolysis of acidulated water, as shown in the diagram.



A .....

B .....

9. Name an element which may be used for the electrodes X and Y as shown in the diagram.

.....

10. In the laying of railway tracks, small gaps are generally left between the rails. Why?

.....

11. What is the cost of running a 2 kilowatt electric heater for 5 hours at 3p per kilowatt-hour?

.....

12. Complete the statement: A positively charged body has lost.....

13. Arrange in decreasing order of activity the metals silver, zinc, magnesium.

.....

14. What is meant by a chemical compound?.....

.....

15. Give one word to describe the shape of the methane molecule. .....

16. What does Brownian movement indicate?.....

17. Write the chemical formula for a molecule of

(i) ammonia .....

(ii) magnesium oxide .....

18. What are isotopes?.....

.....

19. In the following list of gases, underline the ones that are normally present in the atmosphere:
hydrogen methane nitrogen ammonia carbon dioxide.

20. Carbon dioxide gas may be prepared by the action of.....

on.....

21. X is a gaseous element. It reacts with hydrogen to produce another gas which dissolves in water to give the acid found in gastric juice (the digestive juice in the stomach).

Name X. .....

22. What is meant by temporary hardness of water?.....

.....

23. Litmus is an acid-base indicator which shows the colour.....
in an acid and.....in a base.

24. Name the type of bond in the hydrogen molecule.....

25. State two functions of the root in plants.

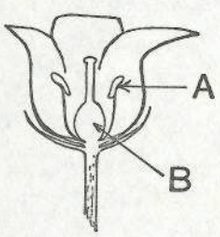
(i) .....

(ii) .....

26. Underline the consumers in the following list:

mouse barley earthworm fern mushroom

27. Name the parts labelled A and B in the diagram of the flower.



A.....

B.....

28. The following is a very important reaction that takes place in living organisms:

food + oxygen = carbon dioxide + water + energy.

What is the reaction called?.....

29. Mention two ways in which seeds are dispersed in nature.

(i) .....

(ii) .....

30. Give two differences between plant and animal cells.

(i) .....

(ii) .....

31. What type of joint is found at the shoulder where the humerus meets the scapula?

.....

32. There are three small bones in the middle ear. Name any two of them.

(i) ..... (ii) .....

33. Name one endocrine gland and one hormone it produces.

....

34. Mention one way in which bacteria are useful to man.

.....

35. Name two organs of excretion in man.

(i) .....

(ii) .....

36. Give one region of the human digestive system where fats are broken down. .....

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A

INTERMEDIATE CERTIFICATE EXAMINATION, 1975

SCIENCE—SYLLABUS A

WEDNESDAY, 18 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.

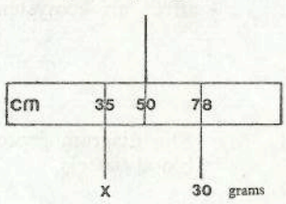
The questions from these sections should be answered in your answer-book.
Answer **one** question from each Section. All questions carry the same marks.

SECTION B

1. (*a*) If you were given an object of known weight describe how you would use a spiral spring to find the weight of a pencil.

   (*b*) The diagram shows a uniform metre stick suspended at its midpoint. A body, X, hanging at the 35 cm mark is balanced by a mass of 30 grams hanging at the 78 cm mark. Find the mass of X.

   Give **two** examples of the use of levers in everyday life.



2. (*a*) How would you plot the magnetic field around a bar magnet? Give a simple diagram to show the arrangement and direction of the lines of force.

   (*b*) Describe how you would demonstrate the magnetic effect of an electric current in a straight wire. Give a diagram.

   (*c*) Draw a labelled diagram of the electric bell and explain briefly how the bell rings.

3. Show, with the aid of a diagram, how you would produce a spectrum, using a white light source and a glass prism. Describe simple experiments, one in each case, to demonstrate the existence of infra-red and ultra-violet light.
   Write down the relation between wavelength, frequency and velocity. State any **two** differences between light and sound.

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SECTION C

4. (*a*) Explain the terms: (i) acid, (ii) base, (iii) salt.

   (*b*) Given that

   $$HCl + X = NaCl + H_2O$$

   write down the name and chemical formula of X. Starting with X and hydrochloric acid describe how you would prepare a reasonably pure sample of sodium chloride (common salt).

   (*c*) If you were given a mixture of sodium chloride and ammonium chloride, how would you separate them?

5. (*a*) Draw a labelled diagram to show the preparation and collection of oxygen **or** sulphur dioxide. List **three** of the physical properties and **three** of the chemical properties of the gas you choose.

   (*b*) Explain the term allotrope.

   Describe briefly how monoclinic (prismatic) sulphur may be prepared from rhombic sulphur and mention one property in which they differ.

6. Sodium and potassium belong to the same family of elements. Name this family and give the name of any other member of the family.

   Draw a simple diagram showing the arrangement of electrons in an atom of sodium. Show also the arrangement of electrons in an atom of chlorine. Describe, in terms of electrons, what happens when sodium reacts with chlorine. Write an equation for the reaction.

   Explain the terms oxidation and reduction. Name the substance oxidised and the substance reduced in the reaction between sodium and chlorine.

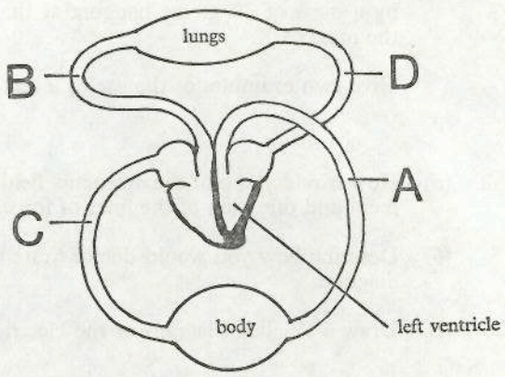
SECTION D

7. What is an ecosystem?

   Explain the terms herbivore and carnivore, and give one example of each from the ecosystem you have studied. To which phyla do those examples belong? Mention briefly how one of the examples is adapted to life in the ecosystem.

   What is meant by pollution? State a possible cause of pollution and give a brief description of how it could affect an ecosystem.

8. (*a*) The diagram represents the human heart and its main blood vessels.

   (i) In one complete circuit the blood passes through all four chambers of the heart. Name the three unlabelled chambers of the heart in the order in which the blood flows through them after it leaves the left ventricle.

   (ii) Which of the blood vessels A, B, C, D, are arteries and which are veins?

   (iii) Two of these blood vessels contain blood rich in oxygen. Which two are they?

   (*b*) Describe an experiment to show that air breathed out from the lungs contains more carbon dioxide than the air breathed in.

9. (*a*) What do you understand by photosynthesis?

   Give two structural features of green leaves that enable them to carry out photosynthesis.

   How would you show the presence of starch in green leaves that had carried out photosynthesis?

   (*b*) Describe an experiment to show that water is lost by the leaves of a green plant.