

INTERMEDIATE CERTIFICATE EXAMINATION, 1983

SCIENCE—SYLLABUS A

A

TUESDAY, 14 JUNE—MORNING, 9.30 to 12.00

Examination Number

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. Define density.  $\frac{M}{V}$  Is mass per unit volume ✓

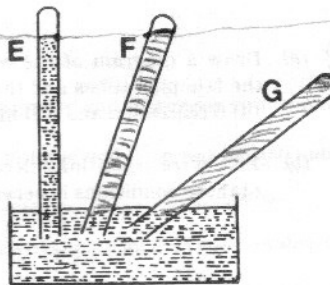
In what units is density measured?  $g/cm^3$  ✓

2. What is a lever? A lever is a rigid object which rotates round a fixed point called the fulcrum. ✓

3. State the law of conservation of energy. Energy may not be created or destroyed but may be changed from one form to another ✓

4. Mercury stands at the height shown in barometer tube E. Mark on the diagram the height of the mercury when the tube is

- (i) in position F,
- (ii) in position G.



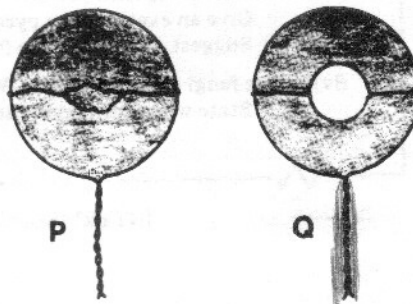
5. What work is done when a force of 20 newtons causes an object to move 5 metres in the direction of the force?

4 kg is moved 5 meters  
 Note: 100 Joules

6. If the temperature of a given mass of gas is kept constant, what will happen to the volume of the gas when the pressure on the gas is doubled?

its volume is halved

7. A loop of thread is tied across a wire ring. The ring is dipped into a soap solution and then removed. A soap film is formed in the ring as shown in diagram P. The soap film inside the thread is then broken. As a result the loop of thread is pulled into the shape of a circle as shown in diagram Q.



Underline which one of the following is being demonstrated:

- viscosity diffusion osmosis surface tension capillarity

8. Give an example to show that light travels faster than sound.

In a pick axe is swung out at the ground. The axe hits & the noise comes later if you observe at a distance.

9. Mention any two ways by which heat can be transferred.

- (i) conduction
- (ii) radiation

10. Complete each of the sentences below by writing in the appropriate word from the following list:

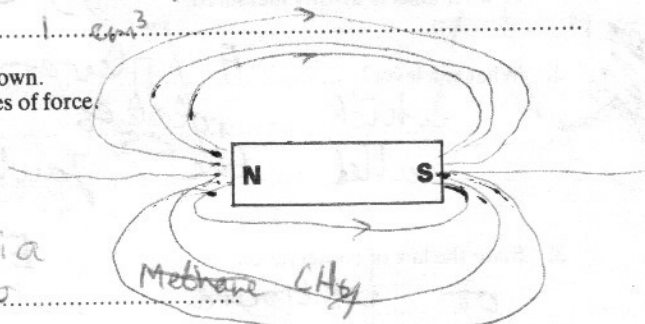
atoms      electrons      ions      neutrons

- (i) Electrical conduction in metals involves the movement of electrons
- (ii) Electrical conduction in electrolytes involves the movement of ions

11. What is meant by specific heat capacity?

Amount of Heat Required to raise 1 cm<sup>3</sup> of a material 1 cm<sup>3</sup>

12. Sketch the magnetic field around the bar magnet shown. Indicate by means of arrows the direction of the lines of force.



13. Name a tetrahedral molecule.

Ammonia  
 Methane (CH<sub>4</sub>)

14. Complete the statement: Isotopes are atoms with the same atomic number but with different

Mass Nos. (No. of Neutrons)

But remember that the mass number = no. of protons + no. of neutrons

15. Explain oxidation in terms of electron transfer.

when an atom loses electrons it has been oxidised. when an atom is oxidised it loses electrons.

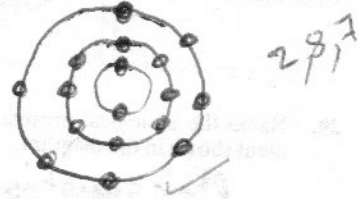
16. Give an example of

(i) a physical change ..... boiling water → water changes to steam when it is boiled..

(ii) a chemical change ..... frying an egg

17. Give an example of a substance that sublimates on heating: ..... carbon dioxide ✓

18. Chlorine has an atomic number of 17. Draw a simple diagram (Bohr-type diagram) to show the arrangement of the electrons in an atom of chlorine.



19. What causes permanent hardness in water?

CaSO<sub>4</sub> dissolved in the water.

20. What is meant by a basic oxide?

An oxide which when dissolved in water gives an Alkaline solution.

Write the formula of a basic oxide: ..... MgO ✓

21. The members of a family of elements have the following properties:

- (i) they are soft and easily cut,
- (ii) they are less dense than water,
- (iii) they react vigorously with water.

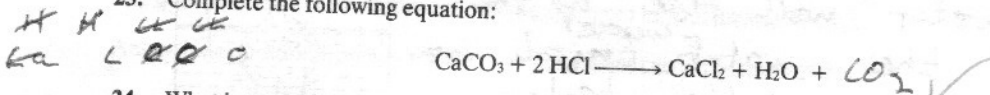
Name two members of this family.

sodium ✓ Potassium ✓

22. (i) An ionic bond is formed when electrons are ..... exchanged between Atoms between ✓

(ii) a covalent bond is formed when electrons are ..... shared between Atoms. shared between ✓

23. Complete the following equation:

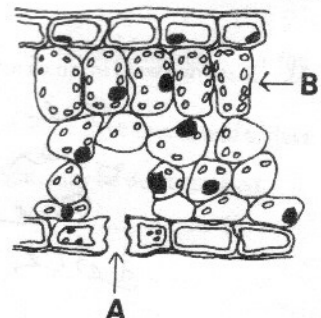


24. What is meant by an exothermic reaction?

Heat is created when it takes place. Heat is added to make it take place.

25. The diagram shows a section through a leaf. Label the parts A and B.

A ..... vacuole vacuole vacuole ✓  
B ..... palisade cell



26. Name two places in the body where you would find a ball and socket joint.

(i) shoulder ✓ (ii) Thigh ✓

27. What is meant by fertilization?

The ~~was~~ joining of a male & female reproduction cell to begin growth of a new organism. ✓

28. Two foods A and B were tested. A was rubbed on a piece of filter paper and as a result a translucent spot was produced on the paper. B was tested with iodine solution and a blue-black colour resulted. Identify the type of food in A and in B.

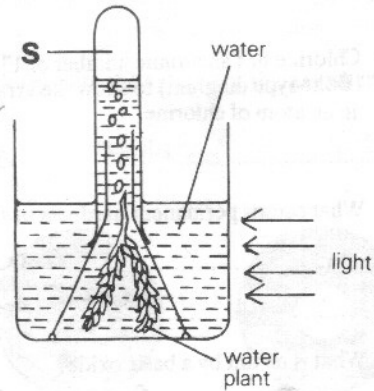
A. fatt ✓ B. starch ✓

29. Name the biological process being studied in the experiment shown in the diagram.

Photosynthesis photosynthesis ✓

What gas is collected at S?

Oxygen ✓  
oxygen



30. What is a parasite?

A parasite is a creature which gets its food from its lives on another creature ✓

Give an example

Flie ✓  
Flie

31. What difference is there between the nutrition in a fungus and in a green plant?

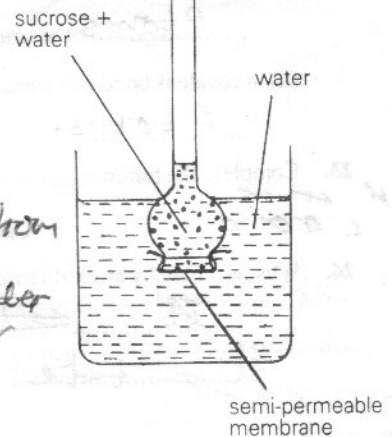
A fungus gains all its nutrition from dead matter but a green plant extracts it from soil and also photosynthesises it. ✓

32. What process is being examined in this experiment?

osmosis ✓

What would you observe during this experiment?

The water will rise up the tube as the water <sup>or sucrose</sup> travels from the less dense in the beaker to the more dense sucrose & water ✓



33. State two ways in which arteries are different from veins.

(i) one carries blood from the head  
then other too

(ii) one has valves the other does not

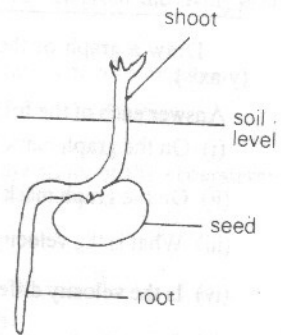
Veins to Head  
Arteries from Head

34. Put the symbol ✓ in the box opposite the correct order of the stages in the life cycle of an insect.

- (i) egg, imago (adult), larva, pupa
- (ii) pupa, imago (adult), larva, egg
- (iii) egg, larva, pupa, imago (adult)
- (iv) egg, pupa, larva, imago (adult)

35. The diagram shows a germinating seed.

- (i) The response of the root to gravity is called geotropism
- (ii) The response of the shoot to light is called phototropism



36. The following is an important reaction that takes place in living organisms.  
 $\text{food} + \text{oxygen} = \text{carbon dioxide} + \text{water} + \text{energy}$

What is the reaction called? respiration  
respiration from the word respire

**INTERMEDIATE CERTIFICATE EXAMINATION, 1983**

**SCIENCE—SYLLABUS A**



TUESDAY, 14 JUNE—MORNING, 9.30 to 12.00

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) Describe, with the aid of a diagram, a simple experiment to investigate the relationship between the extension of a spiral spring and the load (force) producing it.
- (b) Show, with the aid of a diagram, how you would produce a spectrum, using a white light source and a glass prism.  
 Indicate briefly how the existence of (i) infra-red light, (ii) ultra-violet light, may be demonstrated.

2. What is meant by (a) velocity, (b) acceleration?

A trolley moved along a track in a straight line. The distance travelled in metres by the trolley from the start was measured every second. The results are shown in the table below.

Time in seconds	1	2	3	4	5	6
Distance in metres	2	4	6	8	10	12

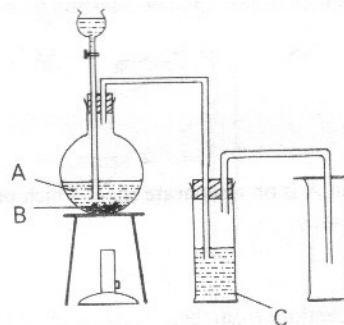
Draw a graph of the results, putting time on the horizontal axis (x-axis) and distance on the vertical axis (y-axis).

Answer each of the following:

- On the graph mark the distance travelled by the trolley in 2.5 seconds.
  - On the graph mark the time taken by the trolley to travel 9 metres.
  - What is the velocity of the trolley when it has travelled 9 metres?
  - Is the velocity different when it has travelled 12 metres?
  - State whether the trolley is accelerating or not. Explain your answer.
3. (a) Draw a labelled diagram of a gold-leaf electroscope.  
How would you use a positively charged electroscope to determine whether a piece of plastic is positively or negatively charged?
- (b) Name three effects of an electric current. Describe an experiment to show *one* of these effects.

### SECTION C

4. (a) Explain the terms (i) acid, (ii) base, (iii) salt.  
Describe, using a diagram, how you would carry out a titration experiment in the laboratory to prepare a salt. Name the acid and the alkali you would use and name the salt obtained. Write the equation for the reaction.
- (b) What is meant by the pH scale? Name (i) a solution with a pH less than 7, (ii) a solution with a pH greater than 7.
5. (a) What are allotropes?  
Name *two* allotropes of sulphur and *two* allotropes of carbon.  
Mention one common use for each of the allotropes of carbon you have named.
- (b) The diagram shows an apparatus for the preparation of sulphur dioxide.  
Give the names of (i) liquid A, (ii) solid B.  
What is the function of the concentrated sulphuric acid in jar C?  
List *four* properties of sulphur dioxide.



6. State, with reasons, whether each of the following is an element, a compound or a mixture:  
water; ammonia; oxygen; carbon dioxide; air.  
Describe experiments, one in each case, to show that air contains (i) oxygen, (ii) carbon dioxide.  
Give *one* difference between exhaled air and inhaled air.

### SECTION D

7. (a) What is an enzyme? Describe a simple experiment to demonstrate the action of an enzyme.
- (b) What is a hormone? On a simple outline diagram of the human body, indicate the position of *three* glands that produce hormones. Name these glands and give the name of *one* hormone produced by each of the glands. Give a function of *one* of the hormones named.

8. (a) Draw a large labelled diagram to show the main external features of a named plant.  
Describe an experiment to demonstrate transpiration.
- (b) Name *three* organs of excretion in the human body. Give *one* substance excreted in each case. Why is excretion necessary for the body?
9. (i) Draw a diagram to describe an ecosystem you have studied. Indicate on the diagram the living and non-living features of the ecosystem.
- (ii) Name *four* organisms found in the ecosystem and say whether they are producers or consumers.
- (iii) State how *two* of the organisms in the ecosystem are interdependent.
- (iv) Select *one* of the following and describe briefly how you would use it in the study of the ecosystem: transect, quadrat, Tullgren funnel.