

Examination Number

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0055930

A

AN ROINN OIDEACHAIS
INTERMEDIATE CERTIFICATE EXAMINATION, 1989
SCIENCE — SYLLABUS A

TUESDAY, 13 JUNE — MORNING, 9.30 to 12.00

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

Thirty items to be answered. All items carry the same marks.

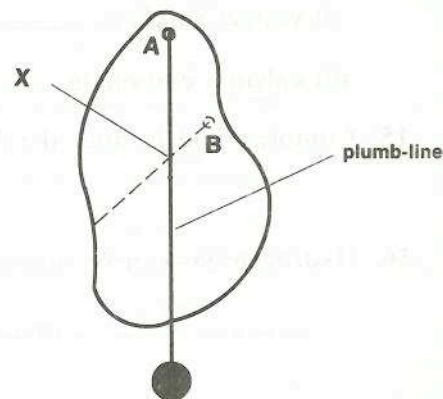
Write your answers in the spaces provided.

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 body increases its velocity uniformly from 10 metres per second to 40 metres per second in 6 seconds. What is the acceleration of the body?

2. The diagram shows a piece of cardboard of uniform thickness suspended freely at a point A. The broken line indicates the position of the plumb-line when the cardboard is suspended freely at another point B. What is the term used for the point X?
.....



3. If the mass of the carbon atom is 1.99×10^{-23} grams write down, in a similar form, its mass in kilograms.
.....

4. State the law of the lever

5. The heat required to change one kilogram of ice at 0°C to water at 0°C is known as

6. A ball-bearing sinks quickly in water but slowly in treacle because of the higher of treacle.

7. A musical note has a wavelength in air of 1.7 metres. Calculate the frequency of the note given that the velocity of sound in air is 340 metres per second.
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8. Heaters used in the central heating of houses, schools, etc., are commonly called 'radiators'. Explain why the word 'radiators' is not a complete description of how the heaters work.

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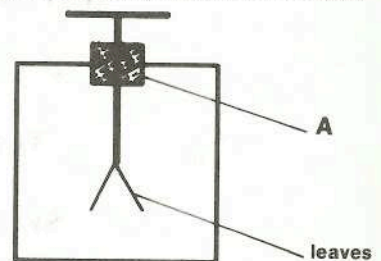
9. Underline the secondary colour in the following list.

089220 red yellow blue green

10. The volume of a definite mass of gas at 20°C and a pressure of 1 atmosphere is 60 cm³. What is the volume of the gas at 20°C and a pressure of 1.5 atmospheres?

.....

11. When a positively-charged body is held close to the cap of the charged electroscope shown in the diagram the leaves open out further. Is the charge on the electroscope positive or negative?



What is the function of A?

.....

12. In wave motion, the distance from one crest to another is known as the

and the height of a crest is known as the

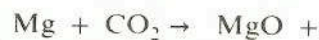
13. Atoms of the same element having different numbers of neutrons are known as

14. Write the chemical formula for each of the following:

(i) copper sulphate

(ii) calcium carbonate

15. Complete and balance the following equation:



16. Hydrogen gas can be prepared in the laboratory by the action of dilute

.....on.....

17. Define heat of neutralisation.....

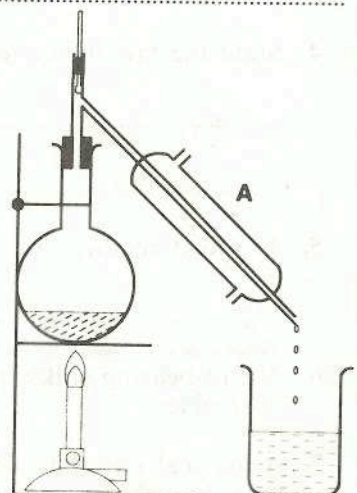
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18. Give the name of the process for which the apparatus shown in the diagram is used.

.....

State the function of A in the process.

.....
.....
.....



19. A change involving the production of one or more new substances is known as a change.

I.S.C.I.P. EXAMINATION PAPER

(for candidates who have followed the Integrated Science Curriculum Innovation Project)

SCIENCE - SYLLABUS A

TUESDAY, 13 JUNE - MORNING, 9.30 to 12.00

A

SECTION A is the same for all candidates and is on a separate sheet. It should be returned with SECTION B.

SECTION B

Answer 4 questions

1. (a) Tick the correct answer.

The piece of glassware which you could best use to measure exactly 25 cm³ of water would be:

- (a) a beaker
- (b) a conical flask
- (c) a graduated cylinder
- (d) a test-tube
- (e) a 10 cm³ pipette

(b) Match each word or phrase in BOX X with the most suitable word or phrase in BOX Y.

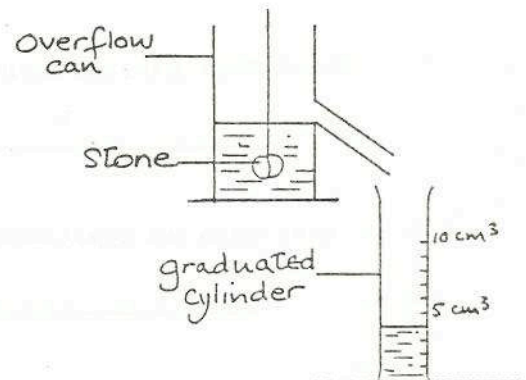
BOX X	BOX Y	ANSWER
1 a barometer is used to measure	A current	1 and
2 a hydrometer is used to measure	B atmospheric pressure	2 and
3 an ammeter is used to measure	C density	3 and
4 a thermometer is used to measure	D voltage	4 and
	E temperature	

(c) Before being suspended in water, the mass of a stone was measured and was found to be 16 g. The stone was then suspended in water as shown in the diagram.

(i) What volume of water does the stone displace?

(ii) What is the volume of the stone?

(iii) Explain how you can calculate the density of the stone and write down your result.



2. (a) Tick the correct answer.

The unit of current is the:

- (a) ampere
- (b) joule
- (c) ohm
- (d) volt
- (e) watt

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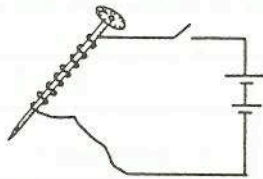
(b) Fill in the blanks in the following sentences.

Name a solid which is a conductor of electricity _____

Name an electrical insulator _____

Name a solution which can be used as an electrolyte _____

(c) The diagram shows a nail wrapped in wire, connected into a circuit. The nail is placed above some iron filings.



(i) What happens to the nail when the current is switched on ? _____

(ii) What happens to the iron filings ? _____

(iii) What happens when the current is switched off ? _____

(iv) Name an appliance used in the home which works like this. _____

3. (a) Tick the correct answer.

A lawnmower is pushed for 6 metres with a force of 20 newtons. The work done is:

- (a) 20 joules
- (b) 60 joules
- (c) 120 joules
- (d) 26 metres
- (e) 100 newtons

(b) Complete the following:-

A force is a push or _____ which can cause a change of shape, a change of _____ or can cause movement. When a force acts, work is done and _____ is required to do this.

(c) Hookes' Law states that:

The extension of a spiral spring is directly proportional to the load applied.

(i) If a load of 5N causes an extension of 20 cm, what extension will be caused by a load of 15N ?

(ii) What extension will be caused by a load of 2.5N ?

(iii) What is meant by the elastic limit of a spring ?

4. (a) Tick the correct answer.

The water supply to our homes is purified by:

- (a) adding acid
- (b) adding chlorine
- (c) centrifuging
- (d) filtration
- (e) sublimation

(b) Complete the table below, using formulae from this list:

ammonia, chlorine, hydrogen, sodium hydroxide, water

Formula	Substance
H ₂	
H ₂ O	
NH ₃	
NaOH	

(c) (i) Some soap solution is added to water, and the sample shaken well, but a lather does not form. What type of water is this ?

(ii) The lather does not form because of chemicals dissolved in the water. Name a chemical which could cause this.

(iii) This type of water will sometimes form a lather easily when it is boiled. If this does not happen, what would have to be done to the water so that a lather can be formed ?

5. (a) Tick the correct answer.

Carbon dioxide can be prepared from:

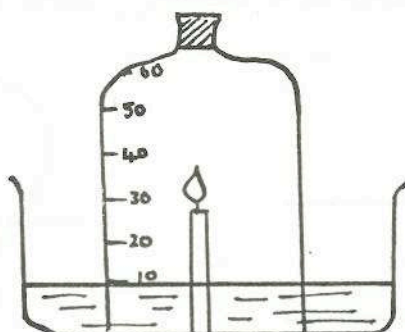
- (a) Limestone and hydrochloric acid
- (b) Manganese dioxide and hydrogen peroxide
- (c) Magnesium and hydrochloric acid
- (d) Sulphuric acid and copper turnings
- (e) Zinc and sulphuric acid

(b) Complete the table below, using words from this list:

carbon dioxide, chlorine, hydrogen, nitrogen, oxygen

Test for gas	Gas
relights a glowing splint	
turns limewater milky	
burns with a "pop"	
is unreactive	

(c)



The experiment shown in the diagram was set up. The candle burned for a few minutes and then went out. The water moved up from the 10 cm mark to the 20 cm mark.

- (i) What gas was used by the burning candle ? _____
- (ii) What gas was produced by the burning candle ? _____
- (iii) Why did the candle go out ? _____

- (iv) Why did the water move up in the bell-jar ? _____

6. (a) Tick the correct answer.

In humans, fertilisation takes place in the:

- (a) cervix
- (b) fallopian tube
- (c) ovary
- (d) uterus
- (e) vagina

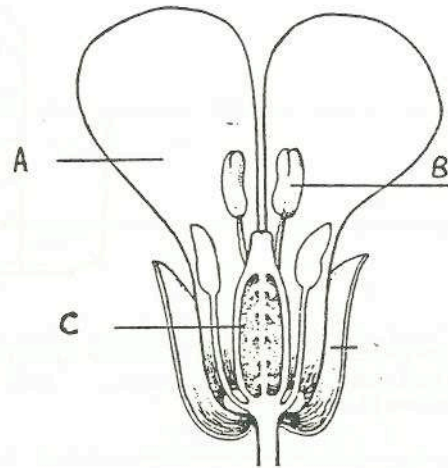
(b) Complete the table below, using words from this list

Ovary, penis, testes, uterus, vagina

Part of reproductive system	function
	to make sperm cells
	to make egg cells
	to protect the developing foetus
	to transfer sperm to female

(c) (i) This diagram shows the parts of a flower. Write down the names of parts A, B and C.

- A _____
- B _____
- C _____



(ii) Why do some plants attract insects to their flowers ?

(iii) List two ways in which flowers are adapted to attract insects.

7. (a) Tick the correct answer

Bile is produced in the

- (a) liver
- (b) lungs
- (c) kidneys
- (d) stomach
- (e) pancreas

(b) Box X contains the names of parts of the digestive system. Box Y contains their functions. Match each part with its function.

BOX X	BOX Y	ANSWER
1 oesophagus	A carries food from mouth to stomach	1 and
2 large intestine	B food is absorbed here	2 and
3 small intestine	C stores and churns food	3 and
4 stomach	D removes undigested food	4 and
	E chews food	

(c) (i) Use this list of foods to answer this part

orange, bran, liver, milk

Pick from the list:

- (a) a food which contains protein and iron _____
- (b) a food which is a good source of fibre _____
- (c) a food which contains carbohydrate and vitamin C _____
- (d) a food which is a good source of calcium _____

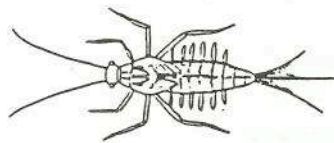
(ii) What are enzymes ? _____

(iii) Where in the body are the enzymes found which break down starch during digestion ?

8. (a) Tick the correct answer

The organism shown in the diagram is a:-

- (a) producer
- (b) herbivore
- (c) decomposer
- (d) carnivore
- (e) scavenger



MAYFLY LARVA
Found in slow or still-moving water
Eats algae and plant debris
Eaten by beetle larvae, beetles, fish
Size 20 mm

(b) Complete the table below, using words from this list:-

Tullgren funnel, pooter, sweep net, quadrat, seeker

Apparatus	What it is used for
	picking up small animals
	sampling a habitat
	catching insects in vegetation
	separating small animals from soil

(c) Name a type of habitat you have studied. _____

Name three plants and three animals you found there.

Plants	Animals
(i) _____	(i) _____
(ii) _____	(ii) _____
(iii) _____	(iii) _____

In the case of one animal, say how it was adapted to that habitat.

20. Underline in the following list the two metals which do not react with steam.

magnesium

copper

silver

iron

21. Give the usual valence of

(i) oxygen.....

(ii) chlorine.....

22. Draw a simple atomic diagram (Bohr type) for the aluminium atom, ${}_{13}^{27}\text{Al}$.

23. Oxidation involves the of electrons and reduction involves the of electrons.

24. Rhombic and monoclinic sulphur are different physical forms of the element. They are known as of sulphur.

25. Name any animal phylum and give an example of an animal that belongs to the phylum you have named.

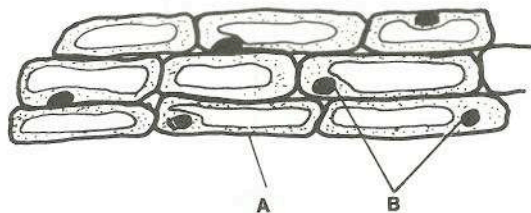
Phylum

Example

26. The diagram shows a cluster of plant cells. Name the parts labelled A and B.

A.....

B.....



27. Give any two organs of the human body which are protected by the skeleton.

(i)

(ii)

28. Respiration may be described as the controlled release of from in living cells.

29. The blood vessels which carry blood away from the heart are known as and the blood vessels which carry blood to the heart are known as

30. Underline in the following list the tissue which functions as a support tissue in plants.

xylem

phloem

cambium

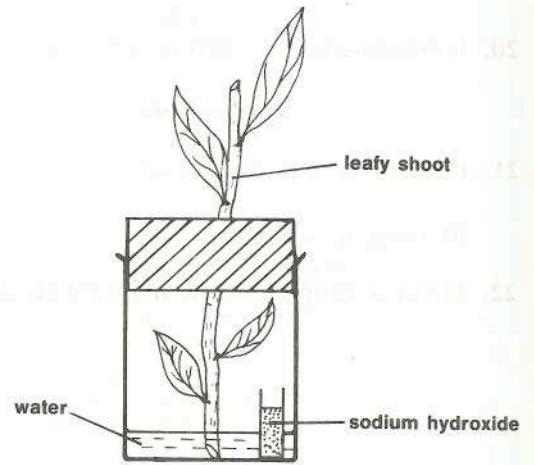
31. In what form is nitrogen absorbed by plants?

What part of the plant absorbs nitrogen in this form?

32. Using the letter T to represent the tallness gene in pea plants, write down the genotype for a pure-breeding tall pea plant

33. The apparatus shown in the diagram was kept in the dark for two days and then exposed to sunlight for about eight hours. What is being investigated in this experiment?

.....



34. The organisms which cause measles, polio, colds and flu all belong to one of the groups in the following list. Underline this group.

bacteria viruses fungi protozoa

35. Place a \checkmark in the box opposite the correct sequence of organs responsible for the reflex withdrawal of the hand from a hot object.

- (i) receptor, sensory nerve, effector, motor nerve
- (ii) receptor, sensory nerve, motor nerve, effector
- (iii) receptor, motor nerve, sensory nerve, effector
- (iv) effector, sensory nerve, motor nerve, receptor

36. The time from conception to birth in humans (and in many other animals) is known as the period.

