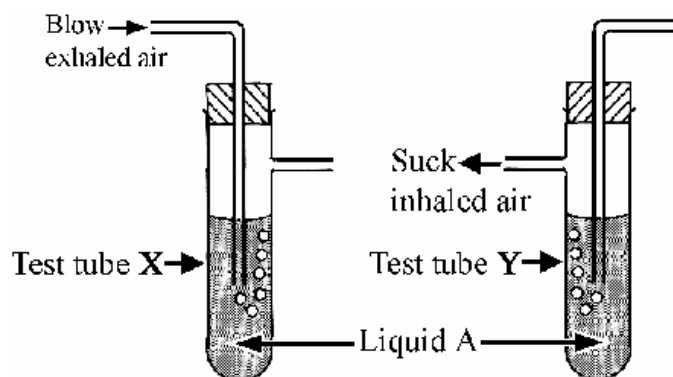


Question 1

- (b) The diagram shows the apparatus used by a pupil when performing an experiment in a school laboratory.

The pupil blew (exhaled) air into test tube X.

The pupil sucked (inhaled) air from test tube Y.



The pupil continued, alternately, blowing and sucking air, as above, until **liquid A** in **one** of the test tubes **turned milky**.

- (i) Name **liquid A**. (3)

Name _____

- (ii) In **which test tube**, X or Y, did the **liquid turn milky**? (3)

Which? _____

- (iii) Why did **liquid A turn milky** in **one** of the test tubes? (3)

Why? _____

- (iv) What **conclusion** can be made from the **result of this experiment** regarding the **difference in composition between exhaled and inhaled air**? (3)

Conclusion? _____

- (v) Complete the **word equation**, below, for **aerobic respiration**. (6)

Food + _____ → _____ + energy + water

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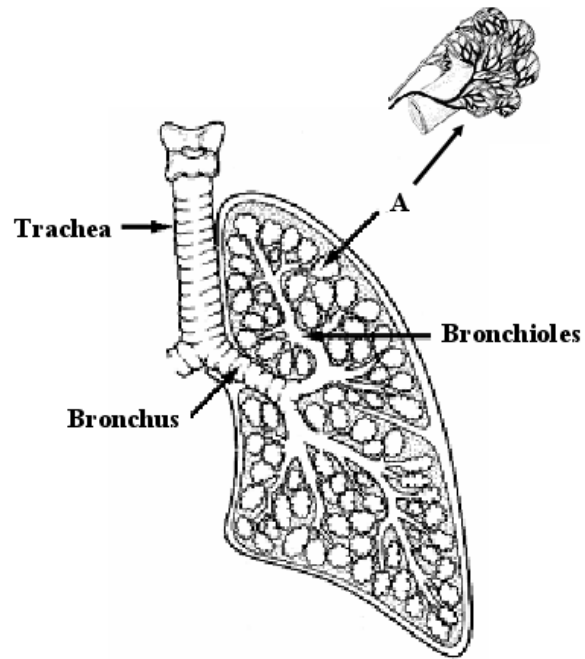
(1) (2)

Question 2

- (a) The diagram shows the structure of a human lung. Air passes in and out of the lungs, via the trachea, bronchi and bronchioles. **Gaseous exchange** takes place in the structures labelled A.

- (i) Name **structure A**. (3)

- (ii) How does **gaseous exchange** take place in the structures labelled A? (6)



(1) (2)

Question 3

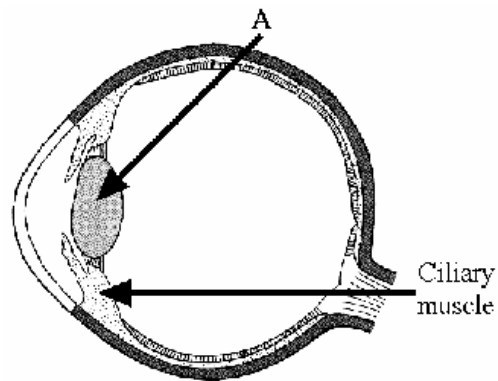
Difference _____

- (d) The diagram is of the human eye. Name the **part** labelled A.

A _____

What **function** has the ciliary muscle?

Function _____



Question 4

- (c) The diagram shows the bones in a human leg. (18)

- (i) Name the bones labelled X and Y.

X_____

- (ii) In the diagram, label the location of a ball and socket joint with the letter **B**.

- (iii) In the diagram, label with the letter A the arrow which shows the direction in which blood flows through *arteries* in the human leg.

- (iv) Describe two differences between the physical structure of arteries and the physical structure of veins. Drawing a labelled diagram may help your answer.

[illegible]

Labelled diagram

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| (1) | (2) |
|-----|-----|
| 1 | 2 |
| 3 | 4 |
| 5 | 6 |
| 7 | 8 |
| 9 | 10 |
| 11 | 12 |
| 13 | 14 |
| 15 | 16 |
| 17 | 18 |
| 19 | 20 |
| 21 | 22 |
| 23 | 24 |
| 25 | 26 |
| 27 | 28 |
| 29 | 30 |
| 31 | 32 |
| 33 | 34 |
| 35 | 36 |
| 37 | 38 |
| 39 | 40 |
| 41 | 42 |
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| 67 | 68 |
| 69 | 70 |
| 71 | 72 |
| 73 | 74 |
| 75 | 76 |
| 77 | 78 |
| 79 | 80 |
| 81 | 82 |
| 83 | 84 |
| 85 | 86 |
| 87 | 88 |
| 89 | 90 |
| 91 | 92 |
| 93 | 94 |
| 95 | 96 |
| 97 | 98 |
| 99 | 100 |

Question 5

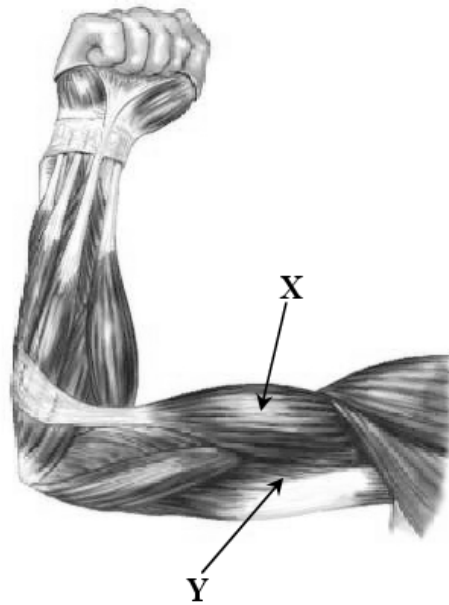
- (a) Important parts of the human arm include muscles, bones, ligaments, tendons and joints. (24)

- (i) Name the two major bones found in the lower part of the human arm, i.e. between the elbow and the wrist.

Bone 1 _____

Bone 2 _____

- (ii) The muscles labelled X and Y in the diagram form an antagonistic pair of muscles, which work together to move the lower arm up and down.



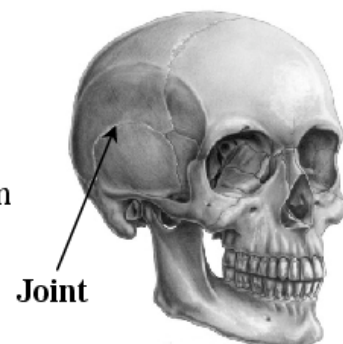
With reference to these muscles, explain how the lower arm is raised.

With reference to these muscles, explain how the lower arm is lowered.

- (iii) Distinguish between ligaments and tendons.

- (iv) Name the type of joint that is located at the human elbow.

- (v) Name the type of joint that is indicated on the diagram of the human skull.

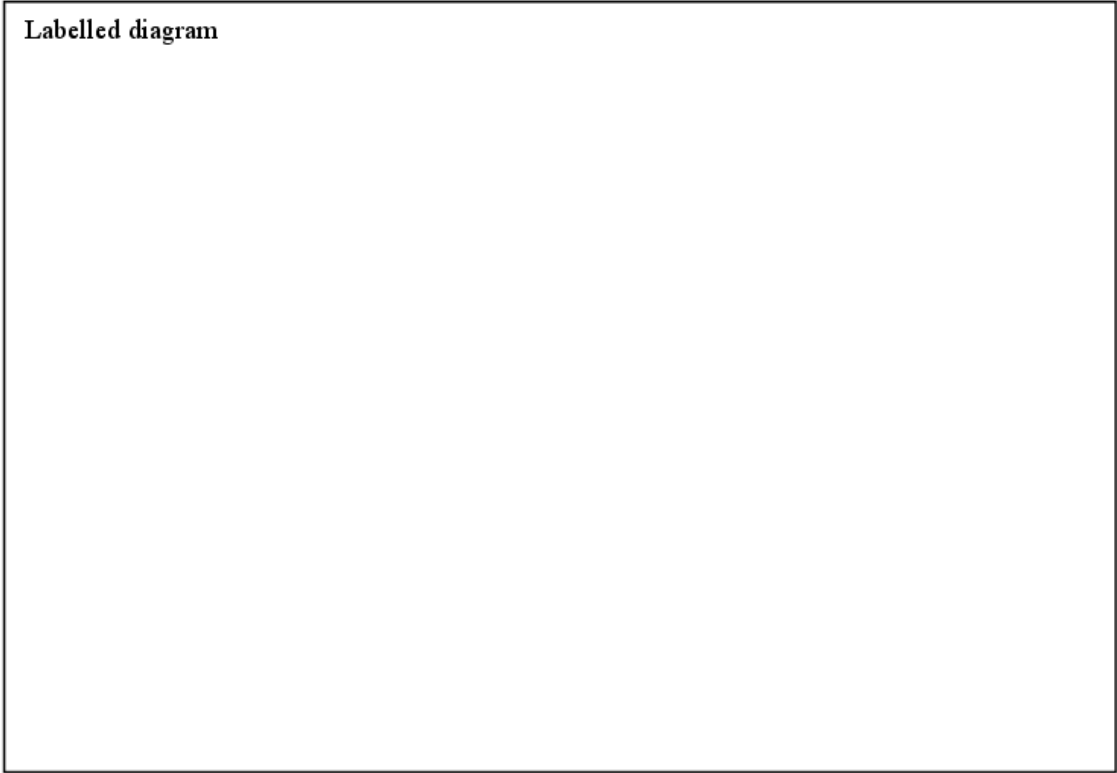


(1) (2)

Question 6

- (a) The element sodium is given the chemical symbol Na and can be found in the Periodic Table on page 79 of the *Formulae and Tables* booklet. (15)
- (i) Sodium is in Group 1 of the Periodic Table.
What is the other name given to this group? _____
- (ii) Sodium-23 is the most common isotope of sodium. Draw a model of the structure of an atom of sodium-23 in the box below. Your labelled diagram should show the location of all of the sub-atomic particles in the atom.

Labelled diagram



- (b) Potassium is also located in Group 1 of the Periodic Table. Many of the chemical properties of potassium are similar to those of sodium. (6)
- (i) Explain why sodium and potassium have many similar chemical properties.
- _____
- _____
- (ii) One chemical property of both sodium and potassium is that they react vigorously in water.

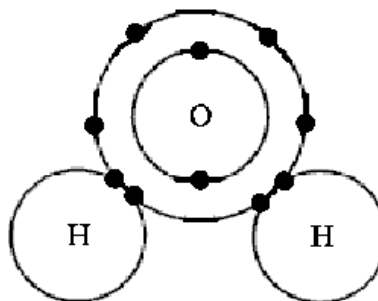
Complete the following word equation for the reaction between potassium and water.

Potassium + Water → _____ + _____

(1) (2)

Question 7

- (a) The diagram shows the way the atoms bond together in a molecule of water.



- (i) What is a molecule? (3)

- (ii) Each hydrogen atom shares two electrons with the oxygen atom. What name is given to the type of bonding that involves the sharing of pairs of electrons? (3)

- (iii) In the space below, draw a diagram of a methane molecule, CH_4 , showing the bonding between its atoms. (6)

- (iv) Describe a second type of chemical bonding and name a compound which has this type of bonding. (9)

Describe _____

Compound _____

(1)

(2)

Question 8

- (b) The table gives the % by volume of five gases/ vapours found in our atmosphere.

| Formula | % Volume |
|------------------|----------|
| N ₂ | 78.08 |
| O ₂ | 20.95 |
| H ₂ O | 0 to 4 |
| Ar | 0.93 |
| CO ₂ | 0.036 |

- (i) Which two of these gases/ vapours are produced when a fossil fuel is burned? (6)

1 _____ 2 _____

- (ii) The amount of water vapour present in air is the most variable.
Suggest a reason for this. (3)

Reason _____

- (c) Describe an experiment, using a labelled diagram in the box provided to show the presence of carbon dioxide in air. (9)

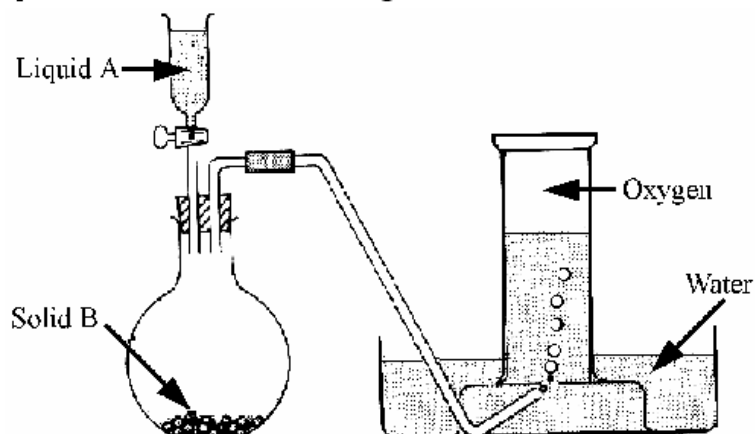
- (d) Give a test to show that the droplets formed on the outside of a glass containing a cold drink are water. (6)



(1) (2)

Question 9

- (a) Oxygen can be prepared by decomposing liquid A using solid B as a catalyst. This preparation is shown in the diagram.



- (i) Name **liquid A**. (3)

Name _____

- (ii) Name **solid B**. (3)

Name _____

- (iii) What is a **catalyst**? (3)

What? _____

Carbon was burned in oxygen and the products tested with pieces of moist red and blue litmus paper.

- (iv) Give the **result of the litmus test** described above and make a **conclusion** based on this result. (6)

Result and conclusion _____

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(1) (2)

Question 10

- (a) The diagram below shows a student's arrangement of the glassware for carrying out a distillation experiment.

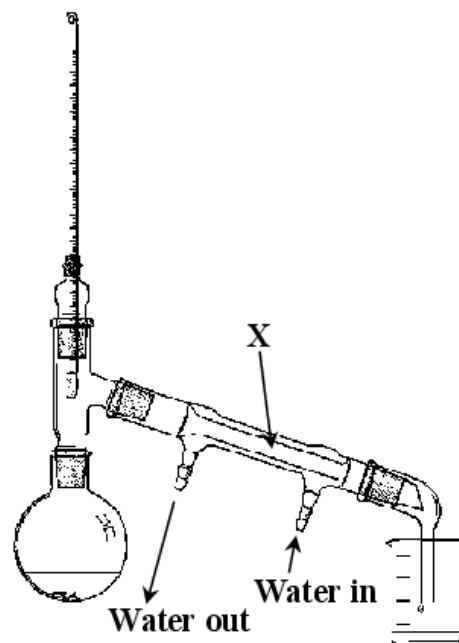
(12)

- (i) Name the piece of apparatus labelled X in the diagram.

- (ii) What is the purpose of the water that is flowing in to and out of the piece of apparatus labelled X?

- (iii) What general name is given to the liquid collected in the beaker?

- (iv) Name an additional piece of laboratory equipment that is needed to carry out this experiment.

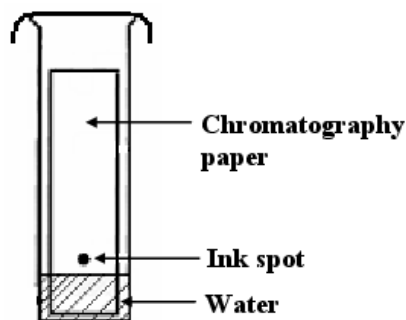


Question 11

- (c) A spot of water-soluble ink was put on a piece of chromatography paper and set up as shown in the diagram. The ink used was a **mixture** of different coloured dyes.

- (i) What happens to the ink spot as the water moves up the paper? (3)

- (ii) What would happen to a spot of water-soluble ink consisting of a **single coloured dye** if it were used in the above experiment? (3)



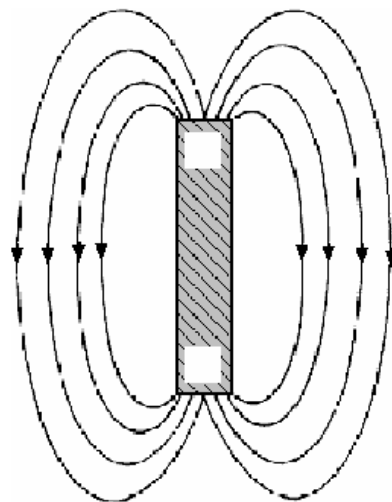
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(1) (2)

(3)

Question 12

- (c) The diagram shows a bar magnet with magnetic field lines on both sides.



- (i) Label the **north pole** (N) *or* the **south pole** (S) of the magnet in the diagram.

(3)

- (ii) What information is given by the arrows on the magnetic field lines?

(3)

What? _____

- (iii) Describe, using a labelled diagram in the box provided, a simple experiment to show that **like magnetic poles repel each other**.

(6)



- (iv) Name a **material** that is attracted by magnets.

(3)

Name _____

- (v) How would you **show** that the Earth exerts **magnetic forces**?

(3)

How? _____

Question 13

(e) Define **temperature** and give a **unit** used to express temperature measurements.



Definition _____

Unit _____

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(1) (2)

Question 14

(b)(i) What are echoes?

(3)

(ii) A man stood 250 metres from a wall and fired a starting pistol.

1.5 seconds later he heard the echo of the shot.

Use this data to calculate the speed of sound in air.

(6)

Question 15

(g) What causes an **echo**?

What? _____