

Stomata by Adina Balan
5th Year biologist.



Don't forget that Yes you can cry in Space
but tears don't fall!
Chris Hadley on YouTube & TED talk-
Amazing!



5th Year Biologist Tests
for Reducing Sugar!



4th year
biologist
extracts
DNA!

First Year Revision

Xylem and phloem make up the transport system in plants. Name a substance, other than water, that is transported in (i) xylem and (ii) phloem.

(i) Xylem _____

(ii) Phloem _____

Inheritable characteristics are controlled by factors which are found on chromosomes.

(i) Name the factors which control inheritable characteristics.

Name _____

(ii) How many chromosomes does a human cell contain?

How many? _____



(iii) Name the **two** principal substances that chromosomes are composed of.

Substance 1 _____

Substance 2 _____

The pH scale is often used when investigating acids and bases.

What is the *pH scale*?

What? _____

Name the **two** chemicals that are reacted together to prepare oxygen gas in the school laboratory.

1 _____

2 _____

State which one of the two chemicals used acted as a catalyst in the reaction.

Catalyst _____

Air is a mixture of gases.

(i) What is a *mixture*? (3)

What? _____

(ii) Name the element which makes up the largest percentage of air. (3)

Name _____

(iii) Name **two** compounds present in air. (6)

1 _____

2 _____

(a) **Name** the piece of equipment shown on the right.

Name _____

Give **one use** for this piece of equipment.

Use _____



Chemistry plays an important role in pharmacy, medicine and the food industry.

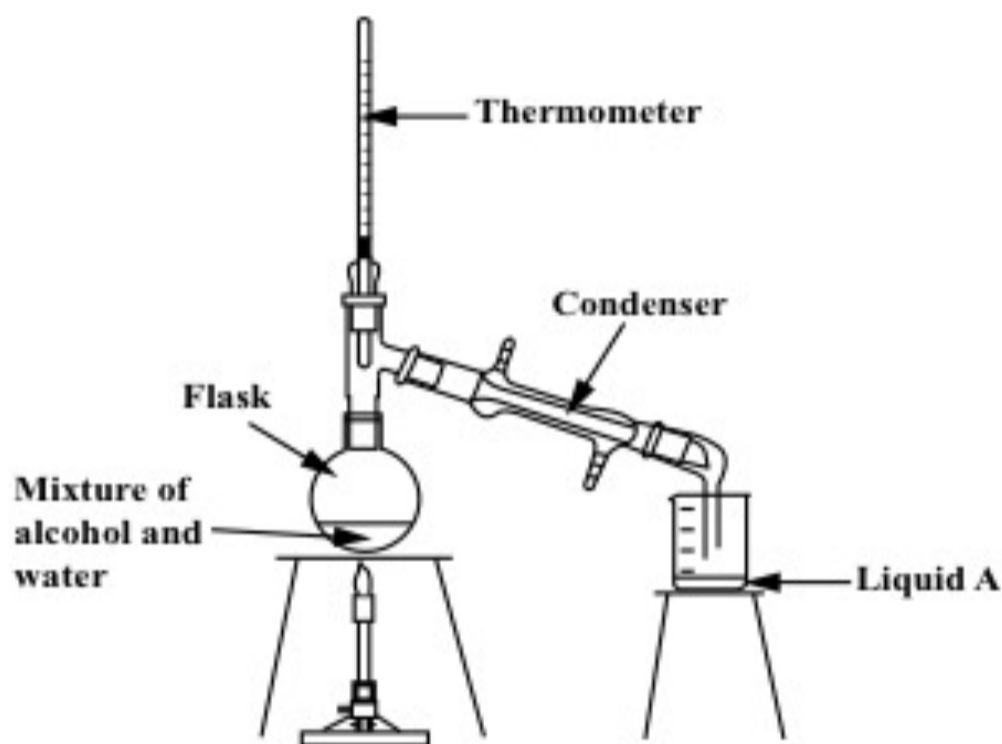
Give **two** examples from any of the areas listed above where chemistry plays an important role in everyday life. (6)

1 _____

2 _____



The diagram shows the apparatus used to separate a mixture of alcohol and water.



(i) Name the separation process shown in the diagram. (3)

Name _____

(ii) The solution in the flask is heated. Is the resulting **liquid A** water? Explain your answer. (6)

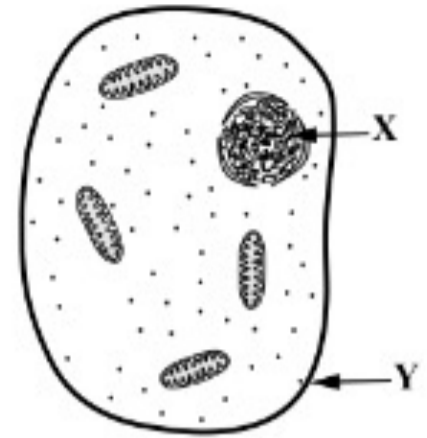
Water? _____

Explain _____

The diagram shows an animal cell.

Name structure **X**.

What is the **function** of structure **Y**?



Name **two** waste substances released by the human kidney.

1 _____

2 _____

Choose **two invertebrates** from the list of animals on the right.

1 _____

2 _____

Earthworm

Robin

Rabbit

Crab

The diagram shows a well-watered pot plant covered with a transparent plastic bag. After a period of time a student noticed drops of colourless liquid on the inside of the bag.

Name this liquid.

Name _____

Name a chemical used to test for the presence of this colourless liquid.

Name _____

What is the **name** of the process being investigated above?

Name _____



(7 × 6 + 1 × 10)

It is important to follow safety rules while working in the laboratory.
Name **two safety precautions** a student should follow while working in the laboratory.

1 _____

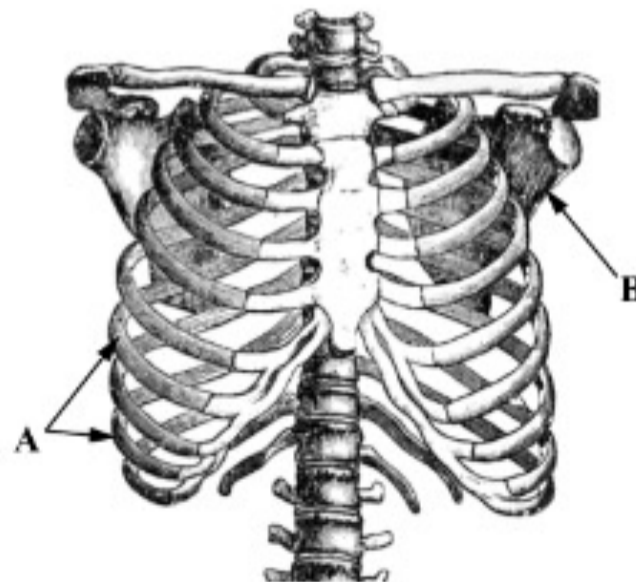
2 _____

Complete the table below by choosing the correct state of matter from the list on the right and matching it with information in the table.

Liquid
Gas
Solid

State of Matter	Shape	Volume
	Definite shape	Definite volume
	No definite shape	Definite volume

(c) The diagram shows part of the **human skeleton**.



Name the **bones** labelled **A** and **B**.

(6)

Bone A _____

Bone B _____

(b) The national demand for energy is ever-increasing.

Give one **advantage or disadvantage** of each of the energy sources shown below. (12)

Solar energy



Advantage or Disadvantage _____

Wind energy



Advantage or Disadvantage _____

Fossil fuels



Advantage or Disadvantage _____

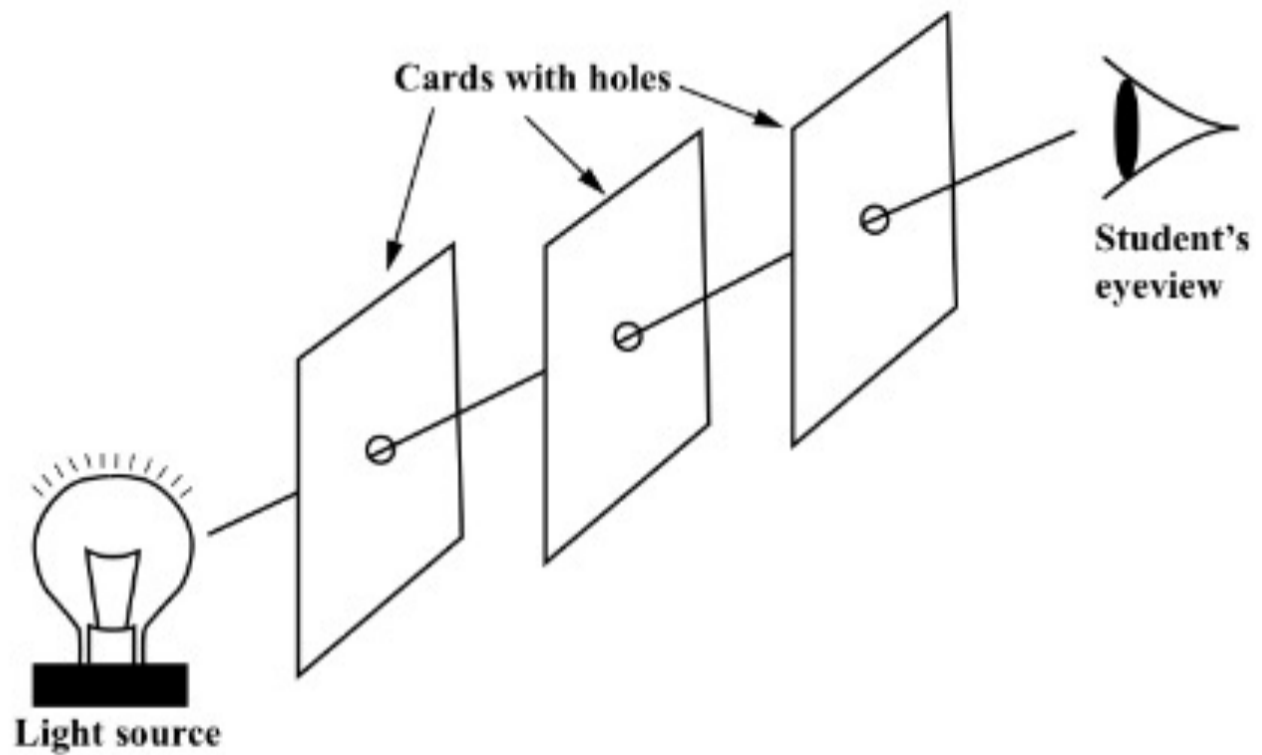
Nuclear energy



Advantage or Disadvantage _____

(c) A student used the following apparatus to investigate a **property of light**.

Study the diagram and answer the questions below. (12)



What would the student see if the middle card was moved slightly?

What does the result of this investigation tell us about light?

Choose the correct word from the list on the right to complete the statements below.

The _____ is a **luminous** object.

A **non-luminous** object _____ light.

Sun
Blocks
Moon
Reflects

(b) A sound level meter is a tool that can be used in noise pollution studies.

In each case complete the sentences below by inserting the correct word from the list on the right.

(12)



Sound is a form of _____.

Sounds are produced by _____ bodies.

Sound reflected from a surface is called an _____.

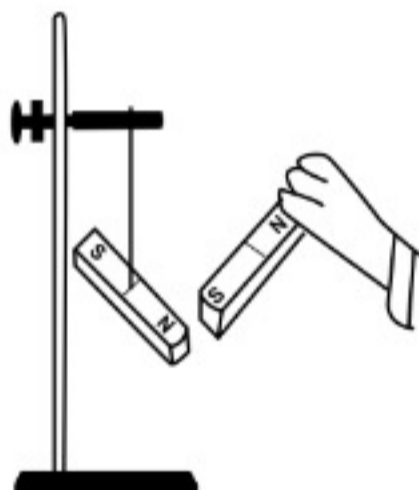
Sound cannot travel through a _____.

- | |
|------------------|
| Vibrating |
| Echo |
| Energy |
| Vacuum |

(b) A student brings the south pole of a magnet up to the north pole of a freely suspended magnet.

What would you expect to happen to the **freely suspended magnet**?

What do you think would happen if the student brought the **north pole** of the magnet up to the north pole of the **freely suspended magnet**?



(c) The photograph shows a lightning strike.

Which is **detected first**, the lightning flash or the thunder clap?

What does this tell us about light and sound?



- (c) Describe, with the help of a labelled diagram, how you would carry out an experiment to **grow crystals using alum or copper sulfate**.
The headings below may be helpful. (12)

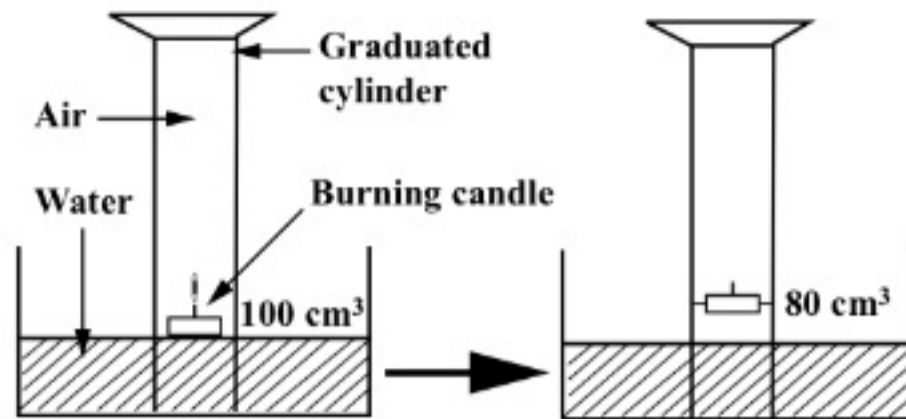
Equipment: _____

Procedure: _____

Result: _____

Labelled diagram

- (b) The apparatus shown was used to **investigate the approximate percentage of oxygen gas in air**.
Examine the diagram carefully and answer the following questions. (9)



- (i) In the table write the letter **O** beside the **percentage of oxygen** in the air shown by the diagram.

	80%
	20%
	Add O₂
	Remove O₂

- (ii) Write the letter **P** beside the **purpose of burning the candle** in the graduated cylinder.

- (iii) Give **one** use for oxygen gas.

- (c) The diagram shows the bones and a type of joint present in the human hip.

- (i) Identify the type of joint labelled A.

Type of joint A _____

- (ii) Give another location in the human body for the type of joint labelled A.

Location _____

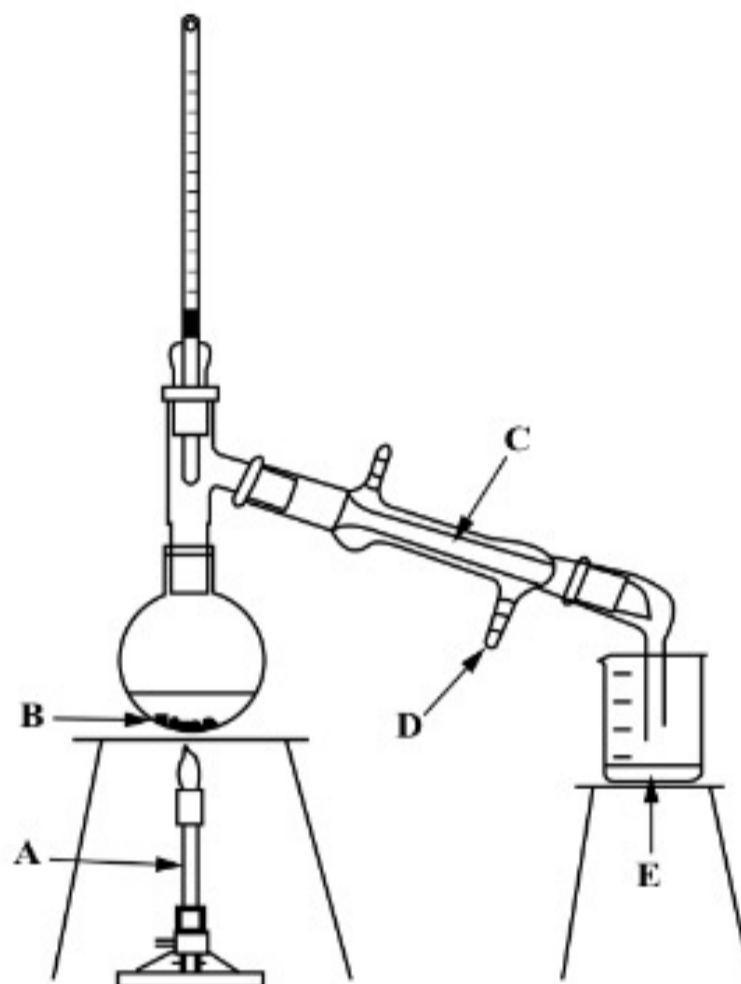


- (d) Describe, using a word equation, how living things release energy from food.

Equation _____

- (c) Separation techniques are very important in chemistry.
The diagram shows the apparatus used to **separate salt from sea water**.

Study the diagram and answer the following questions. (15)



- (i) **Name** the pieces of equipment labelled **A** and **C**.

A _____

C _____

- (ii) In the table write the letter **D** beside the **type of water** entering at **D**.

Write the letter **B** beside the **substance left** in the round-bottomed flask **B**.

	Warm water
	Cold water
	Salt

- (iii) **Name** the **substance** found in beaker **E** at the end of the separation.

From the list on the right choose the correct term to complete the statements below.

A compound

An element

A substance made up of only one type of atom is called _____.

A substance which has two or more different types of atoms chemically joined is called _____.

(h) A science student used the apparatus shown to separate a mixture of alcohol and water based on a difference in a property between the two liquids.

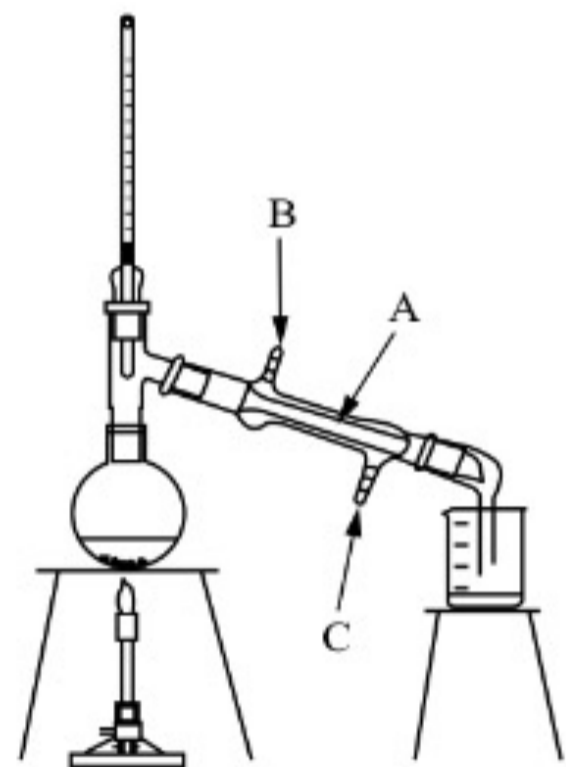
(i) What is this property?

What? _____

(ii) Name the piece of apparatus labelled A.

Name of A _____

(iii) Which connection, B or C, is the cold water inlet?



Question 4

(52)

- (a) Students should follow safety rules while working in the school laboratory.

What **instruction** does the safety sign shown give?



What? _____

Name **another safety rule** that should be followed while working in the school laboratory.

Name _____

- (b) The photograph shows a piece of equipment commonly used in the school laboratory.

Name the piece of equipment.

Name _____

Give **one use** for this item of equipment.

Use _____



- (c) Write the letter **M** beside **two properties of metals** in the table on the right.


	Not shiny
	Good conductor
	Shiny
	Good insulator

(b) The diagram shows a well-watered pot plant covered with a clear plastic bag.

After a period of time, drops of a colourless liquid formed on the inside of the bag.

Answer the following questions.

(9)

	Respiration	
	Transpiration	
	Cobalt chloride	
	Water	
	Litmus	

In the table write the letter **L** beside the **name** of the **liquid** formed on the inside of the bag.

Write the letter **C** beside the name of the **chemical** used to test for the presence of this colourless liquid.

Write the letter **P** beside the name of the **process** being investigated.

A student carried out an experiment to **grow crystals of alum or copper sulfate**.

Name the **solvent** in which the alum or copper sulfate was dissolved.

Solvent _____

How was the solvent heated?

How? _____

What needed to be done to the hot saturated solution so that **crystals formed**?

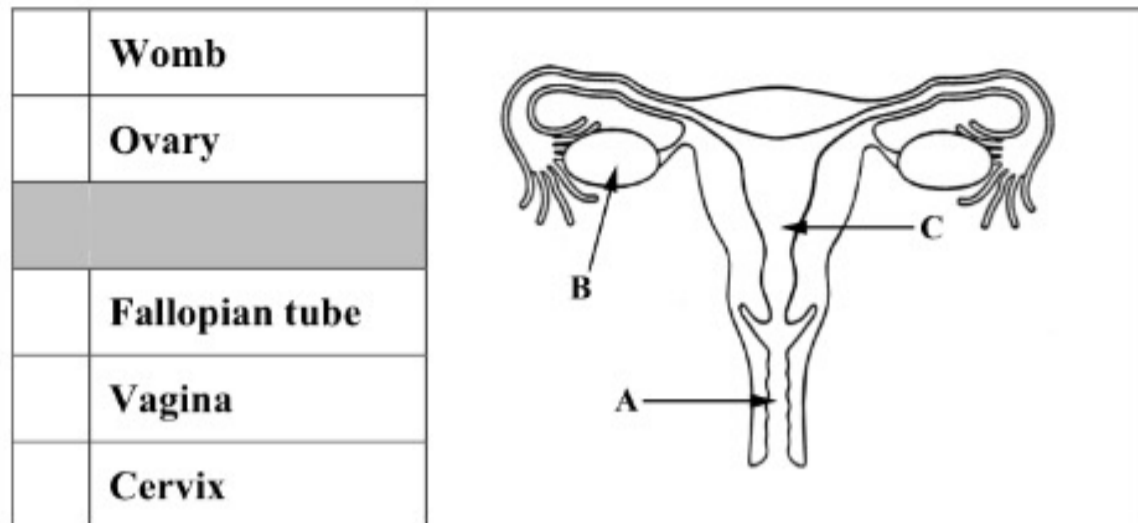
What? _____



(b) The diagram shows the female reproductive system.

Study the diagram and answer the questions below.

(12)



In the table write the letter **A** beside the **name** of the part labelled **A**.

Write the letter **B** beside the **name** of the part labelled **B**.

Write the letter **C** beside the **name** of the part labelled **C**.

Write the letter **F** beside the **name** of the part where **fertilisation** occurs.

(c) The diagram shows the female menstrual cycle.

Answer the following questions.

(15)

What happens during **ovulation**?

What? _____

In human reproduction, what is meant by the "**fertile period**" in the female menstrual cycle?

What? _____



There are many forms of contraception used in family planning.

What is the main **function** of contraception?

Function _____

Name **two** methods of **contraception**.

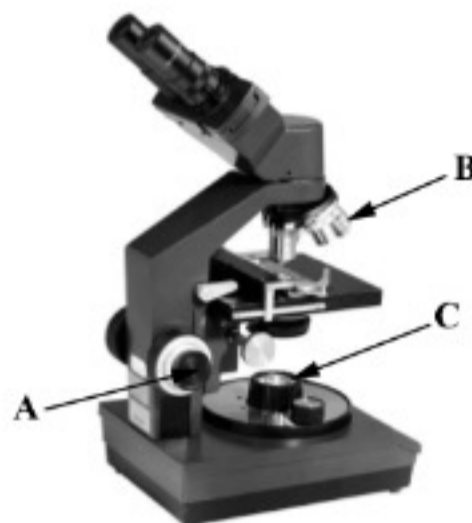
1 _____ **2** _____

(h) The diagram shows a microscope used to examine cells.

Write the letter **A** beside the **function** of the part labelled **A**.

Write the letter **B** beside the **name** of the part labelled **B**.

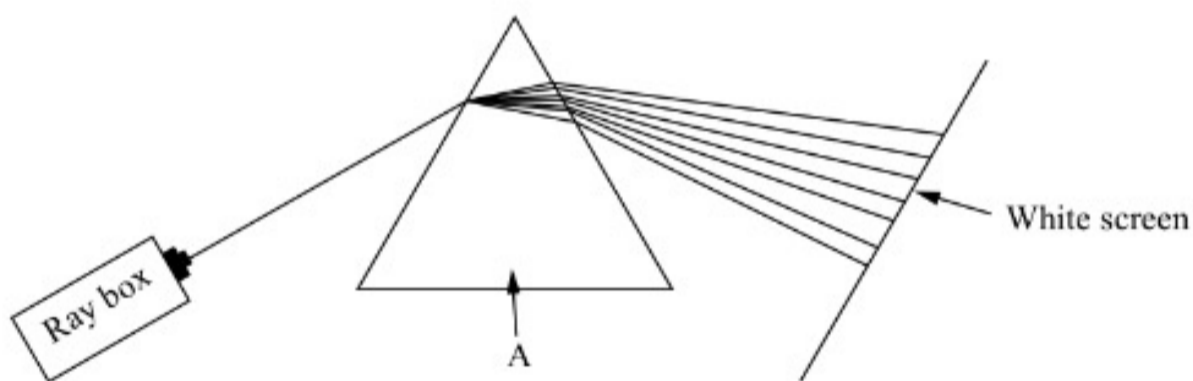
Write the letter **C** beside the **function** of the part labelled **C**.



	Brings the cell into focus
	Magnifies the cell image
	Source of light
	Eyepiece lens
	Objective lens

(7 × 6 + 1 × 10)

(c) A science student investigated the dispersion of white light. A diagram of the apparatus used is given below.



(i) Name the part labelled A. (3)

Name _____

(ii) What is the function of part A? (3)

What? _____

(iii) What word is used to describe the change of direction of light as it enters and leaves part A? (3)

What? _____

(e) **Inheritable characteristics** are controlled by genes.

Write the letter **I** beside **two** inheritable characteristics in the table.

	Ability to speak English
	Freckled skin
	Ability to play tennis
	Eye colour

(f) Choose **one vertebrate** and **one invertebrate** from the list of animals on the right.

Vertebrate _____

Invertebrate _____

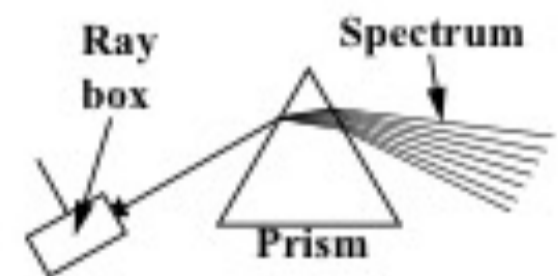
- | |
|---------------|
| Frog |
| Crab |
| Rabbit |
| Spider |

A ray box and a prism, shown in the diagram, were used to produce a spectrum of white light.

Name any **two colours** observed in the spectrum.


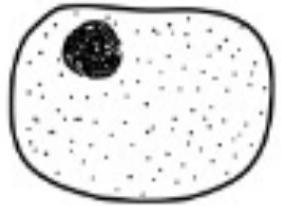
1 _____

2 _____



(a) The diagrams show a plant cell and an animal cell.

In the table write the letter **C** beside **two** parts found in **both** plant cells and animal cells.

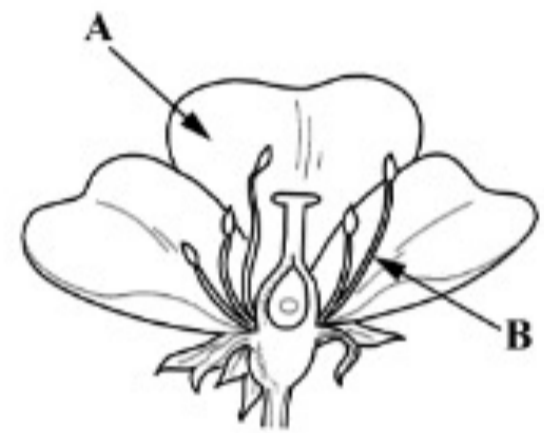
	Cell wall	
	Nucleus	
	Cytoplasm	
	Chloroplast	

(b) The diagram shows a flowering plant.

Name the parts labelled **A** and **B**.

A _____

B _____

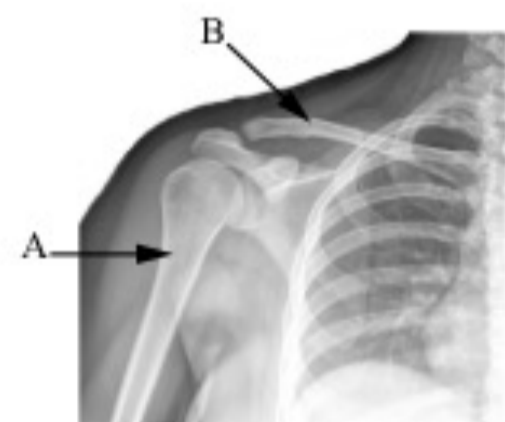


(e) The image shown is an X-ray of a shoulder joint.

Name the *bones* labelled **A** and **B**.

A _____

B _____



(a) The diagram shows the male reproductive system.

(i) Name the **tube** labelled **A**. (3)

Name _____

(ii) Give the **function** of the gland labelled **B**. (3)

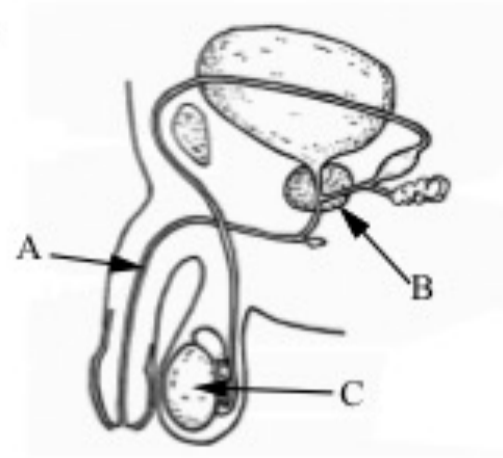
Give _____

(iii) Name the part labelled **C**. (3)

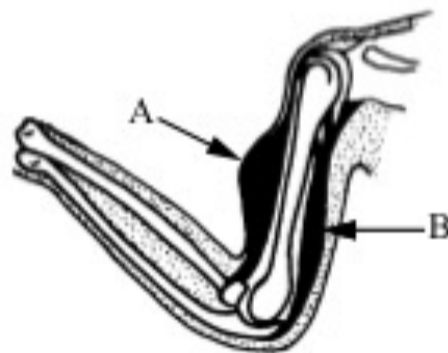
Name _____

(iv) Name a **substance** produced by the part labelled **C**. (3)

Name _____



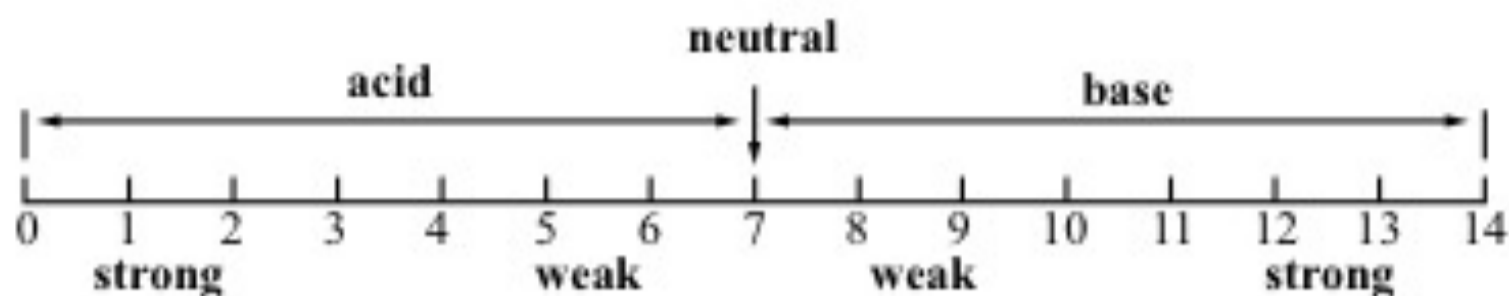
(b) The diagram shows the human upper and lower arm. (9)



Using the correct names for the muscles labelled **A** and **B** describe how they function when *lifting a weight towards the chest*.

Describe _____

Use the pH scale shown to answer the questions that follow. (15)



- (i) A student wants to know how acidic vinegar is using the scale above. Give the name of an **indicator** that the student could use to determine this.

- (ii) Use the scale above to write in the table the letter **O** opposite the pH value for **oven cleaner**.

	Less than 7
	Equal to 7
	Greater than 7

Use the scale above to write in the table the letter **S** opposite the pH value for **stomach acid**.

- (iii) Toothpaste has a pH of 8. What conclusion can you draw from this?

What effect would toothpaste have on moist litmus paper?

Separation techniques are very important in chemistry.
The diagram shows the apparatus used to separate salt from sea water.
Examine the diagram carefully.

- (i) Complete the table correctly by matching the labels **A – E** in the diagram with words/phrases in the table. (15)

	Salty water	
	Salt	
	Water	
	Condenser	
	Cold water in	
	Warm water out	
	Bunsen burner	

- (ii) Give the name of a **separation technique** used to separate the mixture of pigments found in a sample of water-soluble ink. (3)

- (iii) Give the name of a **separation process** that causes wet clothes hanging on a clothes line to dry. (3)

- (iv) How would you **separate** a mixture of **iron filings** and **sulfur**? (3)

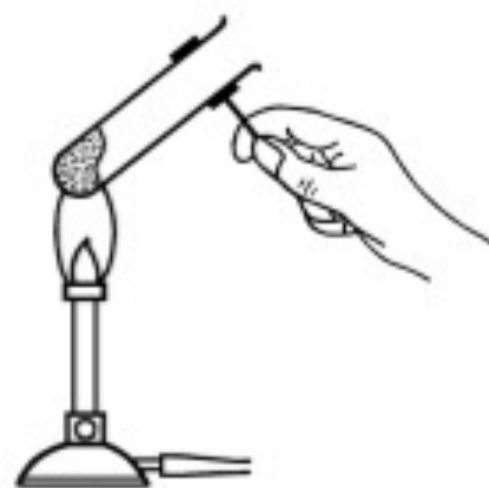
(f) The diagram shows a pupil heating a substance in the laboratory.

(i) Give **one safety precaution** taken by the pupil shown in the diagram.

Give _____

(ii) Name **one other safety precaution** that a pupil would take while heating substances in the laboratory.

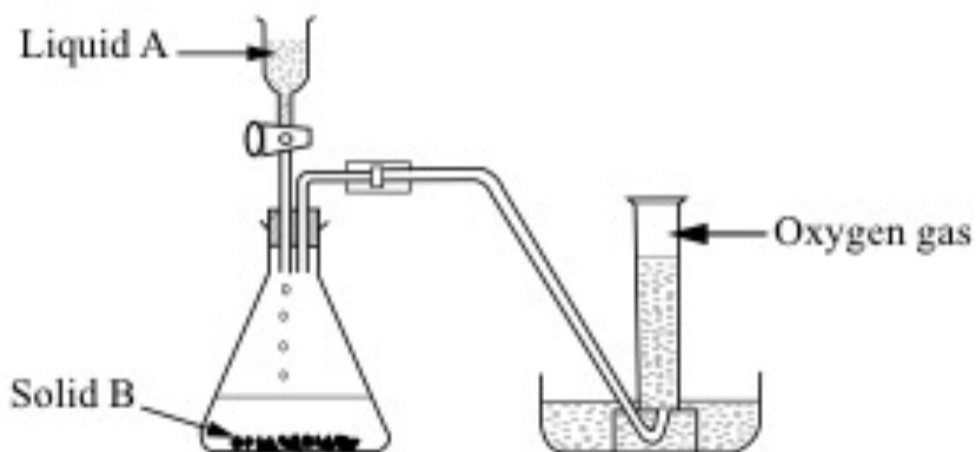
Name _____



(g) The following metals were reacted with dilute acid: copper, magnesium, calcium and zinc. The reactivity of each metal was noted. List these metals **in order of increasing reactivity** (least reactive first).

List _____

(h) The apparatus shown in the diagram was used to produce a sample of oxygen gas in order to investigate its chemical properties.



(i) Identify **liquid A** and **solid B**.

Liquid A _____

Solid B _____

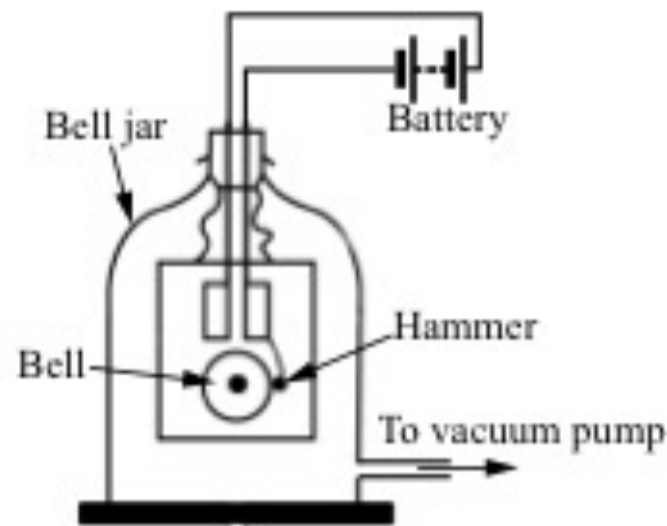
(ii) The sample of oxygen gas collected had **no reaction** with either **red or blue litmus paper**. What **conclusion** can be drawn about oxygen gas from this result?

What? _____

(7 × 6 + 1 × 10)

The apparatus shown was used to investigate if sound needs a medium in which to travel.

(9)



(i) What is **heard** when the air is removed from the bell jar?

(ii) What is **seen** when the air is removed from the bell jar?

(iii) Name **one** difference between light and sound.

(b) The diagram shows a plant cell.

(i) Name the **structures** found inside part **A** which **control inheritable characteristics** in plants.

Name _____

(ii) Why is a **thin section of onion tissue** used to view cell structures using a microscope?

Why? _____

