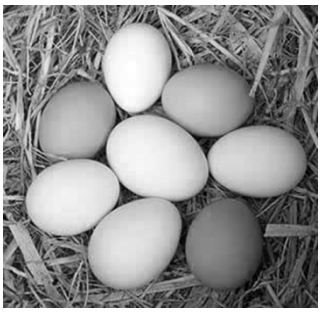
Biology

For Examiner use only (1) (2)

Question 1 (52)

(*a*) Eggs can form part of a balanced diet and provide a good source of some food types. Name two of these food types.



1 _____

2 _____

(*b*) Why is blood considered to be a tissue?

Why? _____

Name a substance transported by blood.

Name _____

(*c*) The cartoon represents global warming.
How can human activity give rise to global warming?

How ? _____

_____

Give one effect of global warming.

Give _____

(*d*) What is contraception?

What? _____

_____

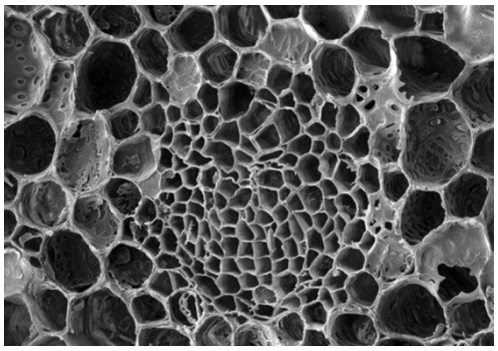
Name one form of contraception.

Name _____

For Examiner use only

(1) (2)

(*e*) The photograph, made by a scanning electron microscope, shows two types of plant vascular tissue, **xylem** and **phloem**.
Give the function of each tissue.



Xylem _____

_____

Phloem _____

(*f*) Name the two substances that chromosomes are made of.

Substance one _____

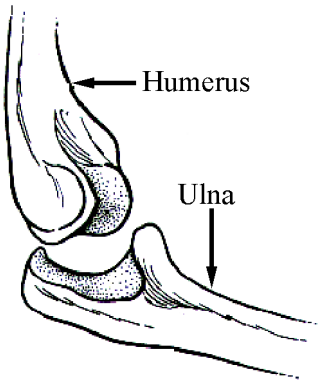
Substance two _____

(*g*) Asexual and sexual reproduction occur in plants. State how a named plant can reproduce asexually.

Name _____

How? _____

(*h*) Name the **type** of joint shown in the diagram.



Name _____

Describe the movements that this type of joint can make.

Describe _____

_____

_____

Explain how muscles cause the movements of this joint.

Explain _____

_____

_____

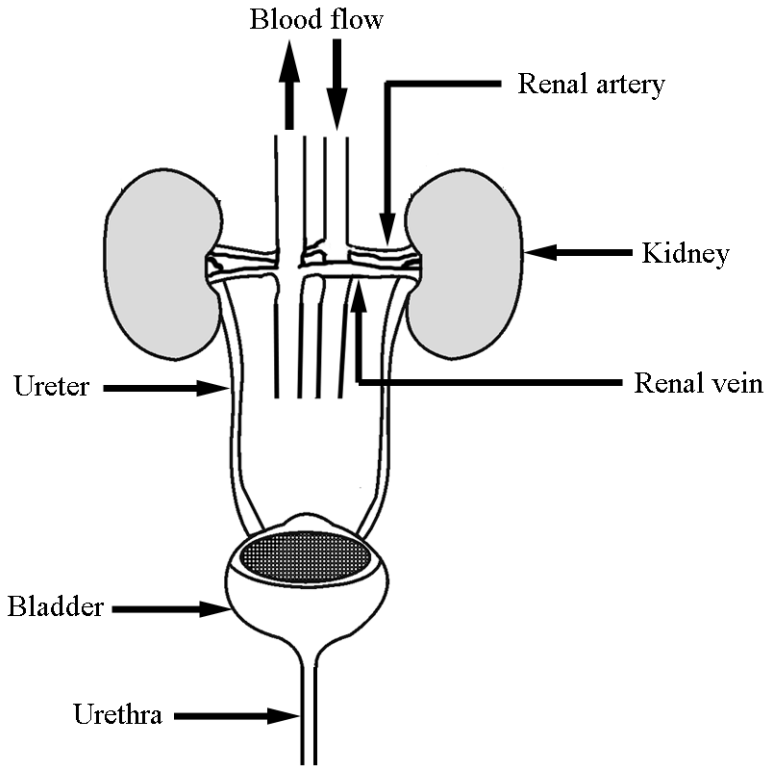
(7 × 6 + 1 × 10)

Question 2 (39)

For Examiner use only

(1) (2)

(*a*) The diagram is of the urinary system. Give the function of **five** of the six parts labelled. (15)



Renal artery _____

Kidney _____

Renal vein _____

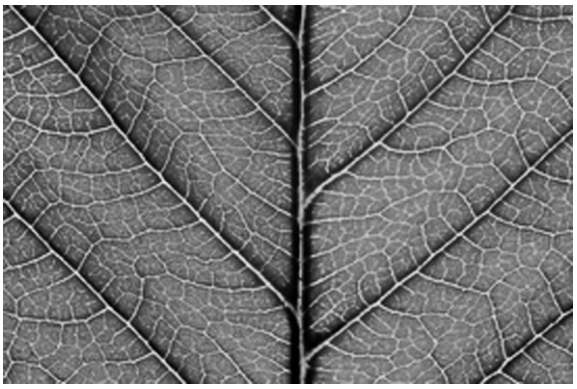
Ureter _____

Bladder _____

Urethra _____

For Examiner use only
(1) (2)

(*b*) The photograph shows part of a leaf of a green plant.



(*i*) Name a gas that moves into and a gas that moves out of a green leaf during active photosynthesis. (6)

Gas in _____

_____

Gas out _____

(*ii*) Outline an experiment to show that photosynthesis produces starch. Use the box provided for an **optional** labelled diagram. (18)

_____

_____

_____

_____

_____

_____

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_____

Question 3 (39)

For Examiner use only

(1) (2)

(*a*) An insect feeds on a flower and picks up pollen. When the insect visits another flower of the same species it leaves some of the original pollen behind.

(*i*) Give a second way in which transfer of pollen between plants occurs. (3)

Give _____

(*ii*) Draw a labelled diagram of a suitable flower showing the stigma, style, ovary, anther and filament in the box provided. (15)

(*iii*) Name the part of the flower that produces the male gamete. (3)

Name _____

(*iv*) Name the part of the flower that produces the female gamete. (3)

Name _____

(*v*) What follows fertilisation in flowering plants? (3)

What? _____

(*b*) Without enzymes we would not be able to exist. Enzymes release energy from food, help build the molecules that our bodies are composed of and break down structures and wastes that we no longer need.

(*i*) Name an enzyme. (3)

Name _____

(*ii*) Name the substrate that the enzyme you have named acts on. (3)

Name _____

(*iii*) Name the product of the action of this enzyme. (3)

Name _____

(*iv*) What reagent might you use, in a laboratory, to test that the reaction has taken place? (3)

Name _____

For Examiner use only
(1) (2)

Chemistry

For Examiner use only

Question 4 (52)

(1) | (2)

(*a*) Alloy car wheels are made from an alloy of aluminium or magnesium. Name another alloy and give a use for it.

Alloy _____

Use _____

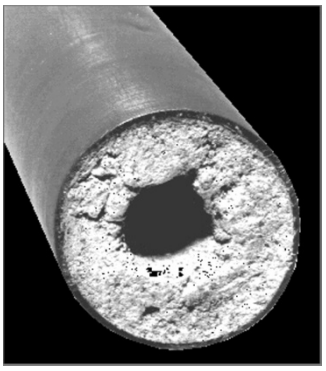
_____

(*b*) What substance is formed when carbon is burned in oxygen? Give the effect of this substance on moist litmus paper.

Substance _____

Effect on litmus _____

(*c*) Water had been flowing through the pipe shown in the photograph for some time. The pipe originally had no internal deposit. Give a possible reason for the formation of the deposit. What do you think the deposit is?



Reason _____

_____

_____

Deposit _____

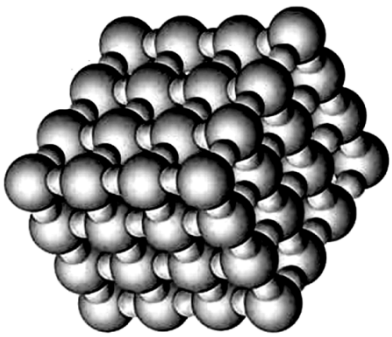
(*d*) Using their atomic symbols, arrange the metals, copper, calcium, zinc and magnesium in order of decreasing reactivity with dilute hydrochloric acid.

_____

For Examiner use only

(1) | (2)

(*e*) The diagram shows part of a crystal of sodium chloride. Name the type of bonding in sodium chloride. Describe this type of bonding.



Name _____

Describe _____

_____

(*f*) Select a substance from the list with a pH less than 7 and one with a pH greater than 7: orange juice, rain water, toothpaste, bread soda, vinegar, sour milk, milk of magnesia, cola, washing soda.

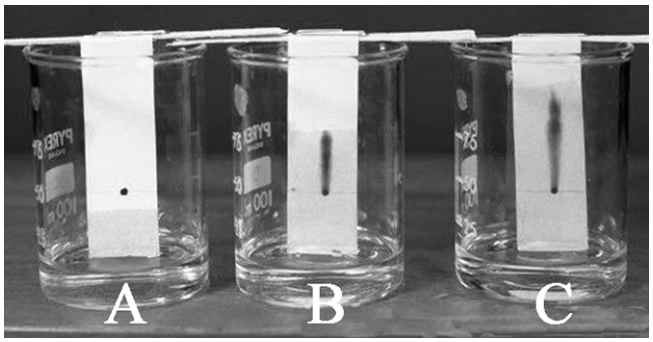
pH less than 7 _____

pH greater than 7 _____

(*g*) Name two non-metallic elements.

1 _____ 2 _____

(*h*) Paper chromatography was used to find the composition of brown ink in a pen. The same liquid, paper and pen were used in each of the three experiments shown. They were started at different times, **C** first then **B** and finally **A.**



(*i*) Why is the ink dot above the level of the liquid in each beaker?

Why? _____

(*ii*) What caused the dots of ink on the papers **B** and **C** to spread upwards?

What? _____

(*iii*) Why were colours, other than brown, seen in **B** and **C** as the ink moved up the paper?

Why? _____

(7 × 6 + 1 × 10)

Question 5 (39)

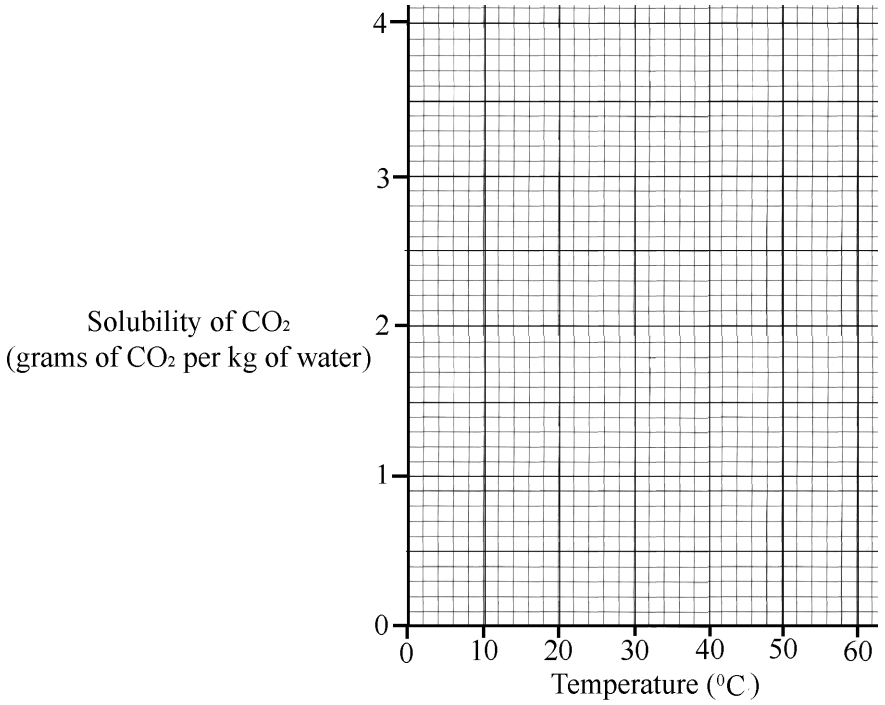
For Examiner use only

(1) (2)

(*a*) An experiment was performed to investigate the effect of temperature on the solubility of carbon dioxide in water. The data obtained from this experiment is given in the table below.

Solubility of CO_2 (grams of CO_2 per kg of water)	3.4	2.5	1.7	1.4	1.0	0.8	0.6
Temperature (^oC)	0	10	20	30	40	50	60

(*i*) Draw a graph of solubility against temperature in the grid below using the data from the table. A smooth curve is required. (9)



(*ii*) Usually the solubility of a solid increases with increasing temperature. The solubility of a gas decreases as the temperature increases. Suggest a reason why this decrease happens. (3)

Suggest _____

_____

_____

(*iii*) From the graph estimate the temperature at which the solubility of CO_2 is 2 g per kg of water. (3)

_____

For Examiner use only

(1) (2)

(*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_2O	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)

_____

_____

_____

_____

_____

Question 6 (39)

For Examiner use only

(1) | (2)

(*a*)

The photograph shows a water treatment plant that produces water fit for domestic consumption. Name and describe four processes used in this treatment of water. (24)

(*i*) Name _____

Describe _____

_____

(*ii*) Name _____

Describe _____

_____

(*iii*) Name _____

Describe _____

_____

(*iv*) Name _____

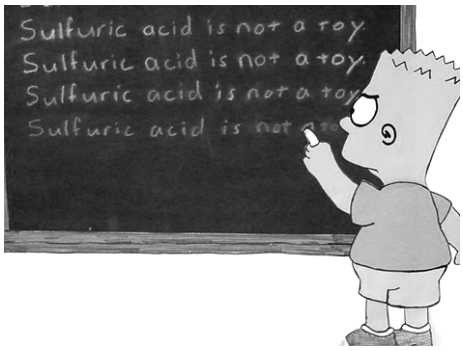
Describe _____

_____

For Examiner use only

(1) (2)

(*b*) Bart is doing lines.
Most Junior Certificate candidates have three years experience of working in a school laboratory. Give two important safety rules, that must be followed at all times by everyone in the laboratory. (6)



Rule 1 _____

_____

Rule 2 _____

_____

(*c*) Describe the reaction of a named alkali metal with water and name a product of the reaction. (9)

_____

_____

_____

_____

_____

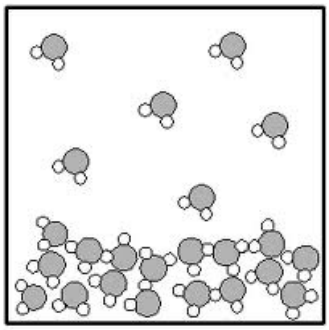
Physics

For Examiner use only

(1) | (2)

Question 7 (52)

(*a*) The diagram shows the evaporation of water. What is evaporation?



What? _____

_____

What do water molecules have to gain in order to evaporate from liquid water?

What? _____

(*b*) Explain the difference between direct current (dc) and alternating current (ac).

Explain _____

_____

(*c*) What causes the appearance of a 'second' drinking straw in the drink in the glass shown in the photograph?

What? _____

_____

_____

(*d*) The conversions of chemical energy to kinetic energy to potential energy occurs when you walk up a stairs. Give two more everyday examples of energy conversions and the contexts in which they occur.

1 _____

_____

2 _____

_____

For Examiner use only

(1) (2)

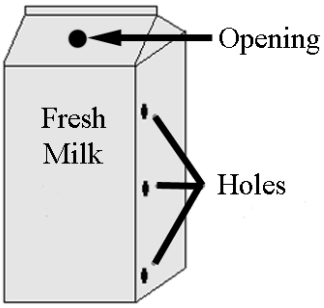
(*e*) The damage to the railway tracks shown in this image was caused by an environmental factor. Name the factor and explain how it caused the damage.

Name _____

Explain _____

_____

(*f*) Three holes were made in a carton of milk at the same time. From which hole will the milk pour out at the greatest rate? Give a reason for your answer.



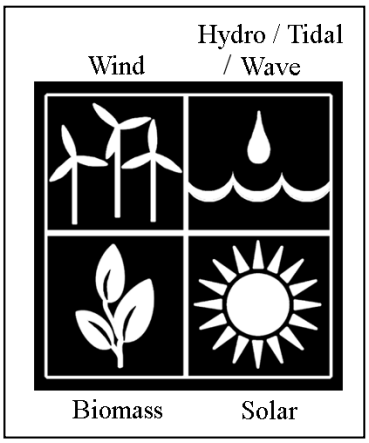
Which? _____

Reason _____

(*g*) Fuses are used in some electrical circuits for safety. How does a fuse work for our protection?

How? _____

(*h*) Renewable energies are shown in the picture.



Pick any two of the energies shown in the picture and name your selection.

Energy one _____

Energy two _____

(*i*) Give one advantage associated with each energy you've selected.
Two **different** reasons must be given.

Energy one _____

Energy two _____

(*ii*) Give one disadvantage associated with each energy you've selected.
Two **different** reasons must be given.

Energy one _____

Energy two _____

(7 × 6 + 1 × 10)

Question 8 (39)

For Examiner use only

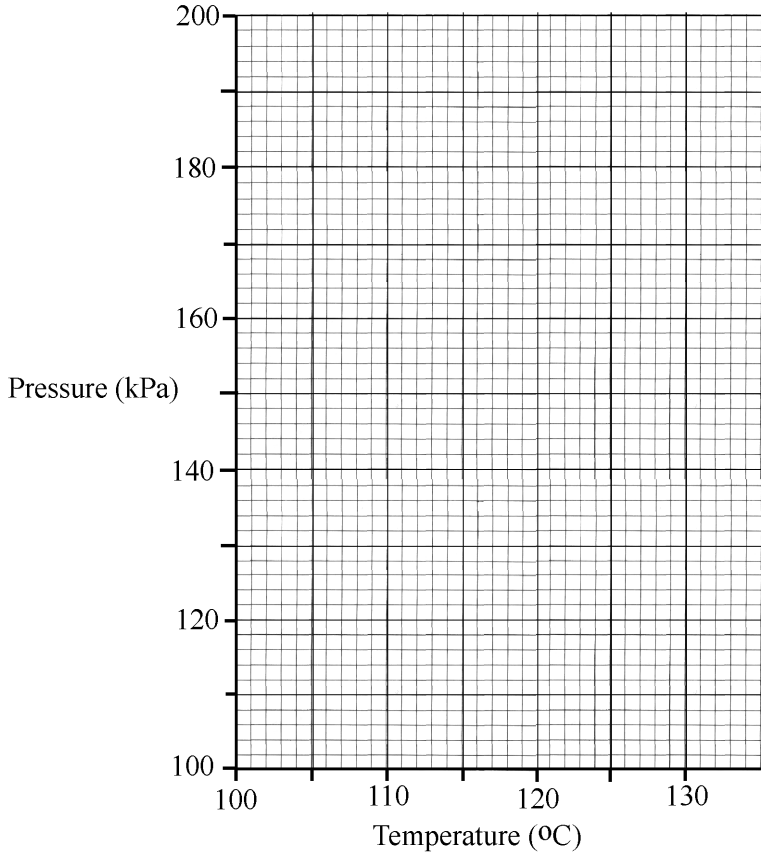
(1) | (2)

(*a*) Define pressure._____ (3)

An experiment was performed to investigate the effect of pressure on the boiling point of water. The data from the experiment is given in the table below.

Pressure (kPa)	100	120	140	160	180	200
Temperature (^{o}C)	100	105	109	114	119	124

(*i*) Draw a graph of pressure against temperature using the grid below. (9)



(*ii*) What two pieces of information can be drawn from the graph about the relationship between the boiling point of water and pressure. (6)

1 _____

2 _____

(*iii*) What effect would reducing the pressure on water below normal atmospheric pressure, about 100 kPa, have on its boiling point? (3)

What? _____

For Examiner use only

(1) (2)

(*b*)

The kilowatt-hour is the unit of electrical energy used by electricity suppliers. The photograph shows a kWh (kilowatt-hour) meter. This meter is connected into the electricity consumer's domestic circuit and it can measure energy consumption in a selected part of the circuit, the total energy used and cost it. The meter can be wall-mounted in a convenient place.

(*i*) Give two advantages to the consumer of having this type of meter. (6)

1 _____

2 _____

(*ii*) Define the Watt, the unit of power. (6)

Define _____

(*iii*) Give one application of the chemical effect and one application of the the magnetic effect of electric current. (6)

Chemical effect _____

_____

Magnetic effect _____

_____

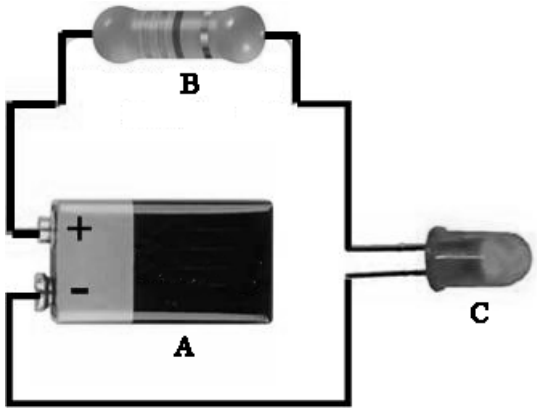
Question 9 (39)

For Examiner use only

(1) (2)

(*a*) The circuit shown in the diagram was set-up by a pupil. Component **C** gave out light.

(*i*) Name components **B** and **C** labelled and shown in the diagram. (6)



B _____

C _____

(*ii*) Give the function of component **A** and the function of component **B**. (6)

A _____

B _____

(*iii*) Draw a diagram of a circuit that could be used to measure the resistance of a light-dependent resistor (LDR) when exposed to light of varying brightness. (9)

For Examiner use only
(1) (2)

(*b*) The plastic comb has been used to comb hair and it now picks up small plastic balls. Why does this happen? (6)

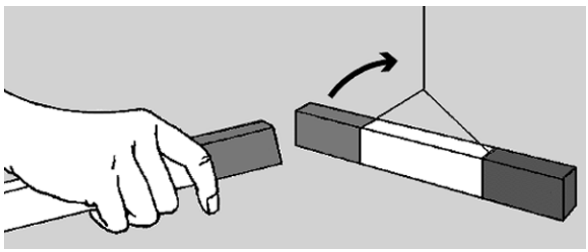
Why? _____

_____

_____

_____

(*c*) The diagram shows the interaction between two magnets. Explain why this happens. (6)



Explain _____

_____

_____

(*d*) Parts (*b*) and (*c*) of this question show examples of forces that can act without contact. Name a third different force that can act without contact. Give one important effect of the force that you have named. (6)

Name _____

Effect _____