



KS3 Science

Green Plants

Question Paper

Time available: 50 minutes

Marks available: 64 marks

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1.

A garden centre has two types of the same plant for sale.

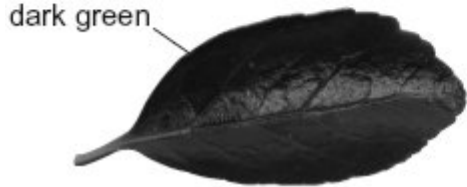
normal type



variegated type

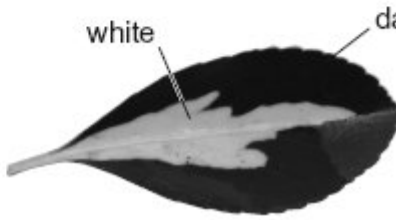


normal leaf



dark green

variegated leaf



white

dark green

Chlorophyll makes a plant leaf green.

- (a) At the end of the summer, the normal plants had grown more than those with variegated leaves. All the plants had been grown in the same conditions.
 - (i) Explain why plants with normal leaves grow more than plants with variegated leaves.

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

2 marks

- (ii) Describe an investigation you could do to show how much more a normal plant grows **compared** with a variegated plant over a six-week period.

In your answer, you must clearly identify:

- the independent variable (IV)
- the dependent variable (DV)
- the variables to control (CV)
- how you will calculate the end result.

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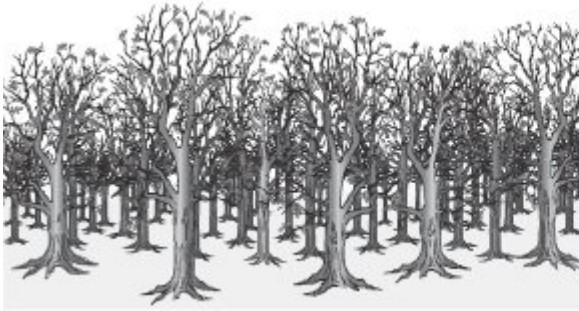
4 marks

- (b) What process do plants carry out in the light and in the dark to release energy?
Tick the correct box.

photosynthesis	<input type="checkbox"/>	respiration	<input type="checkbox"/>
absorption	<input type="checkbox"/>	dispersal	<input type="checkbox"/>

1 mark
maximum 7 marks

2. The drawings below show the trees in a woodland area at the beginning of May and at the end of May.

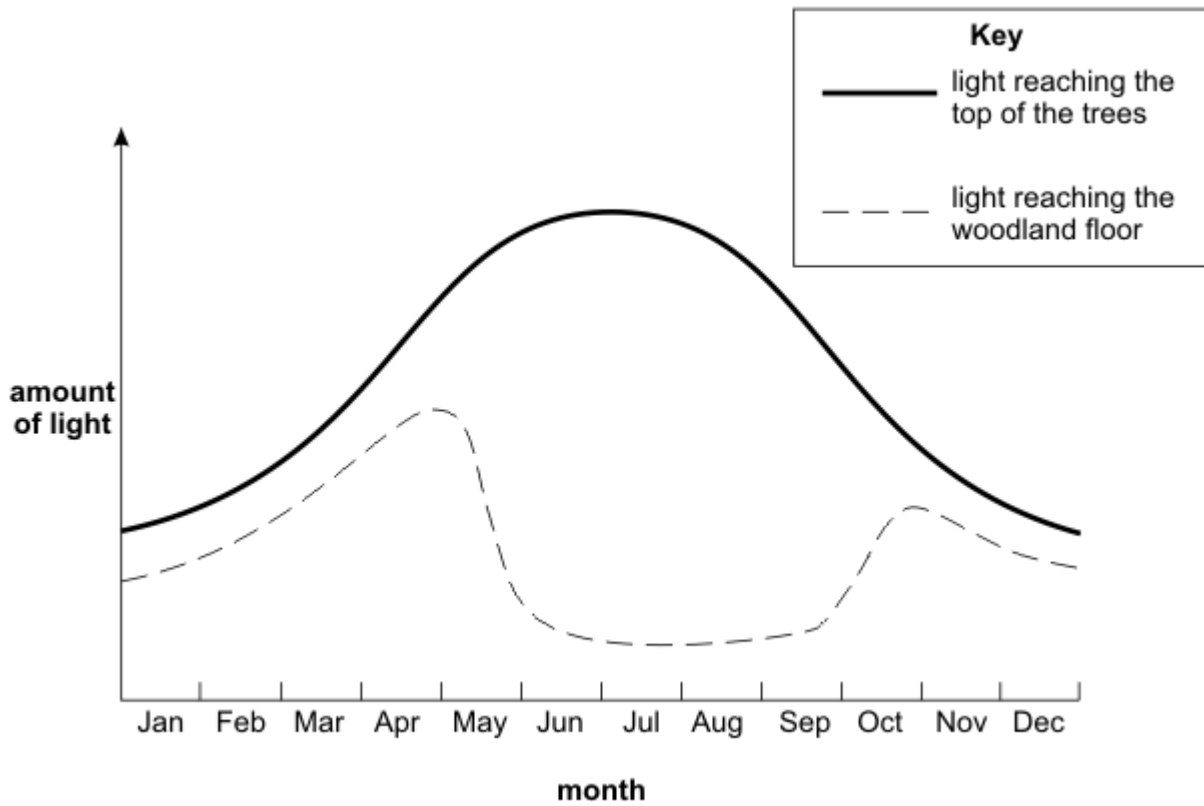


beginning of May



end of May

The graph below shows the amount of light reaching the top of the trees and the woodland floor over one year.



- (a) Why does the amount of light reaching the woodland floor decrease during May?

.....

.....

1 mark

(b) Plants grow on the woodland floor.

Explain why these plants grow bigger **and** faster when there is plenty of light.

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

2 marks

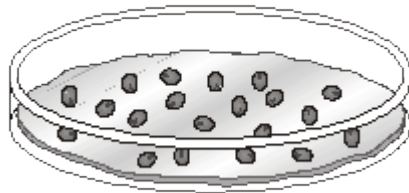
(c) **Respiration** takes place in the cells of all plants.

Complete the word equation for **respiration**.

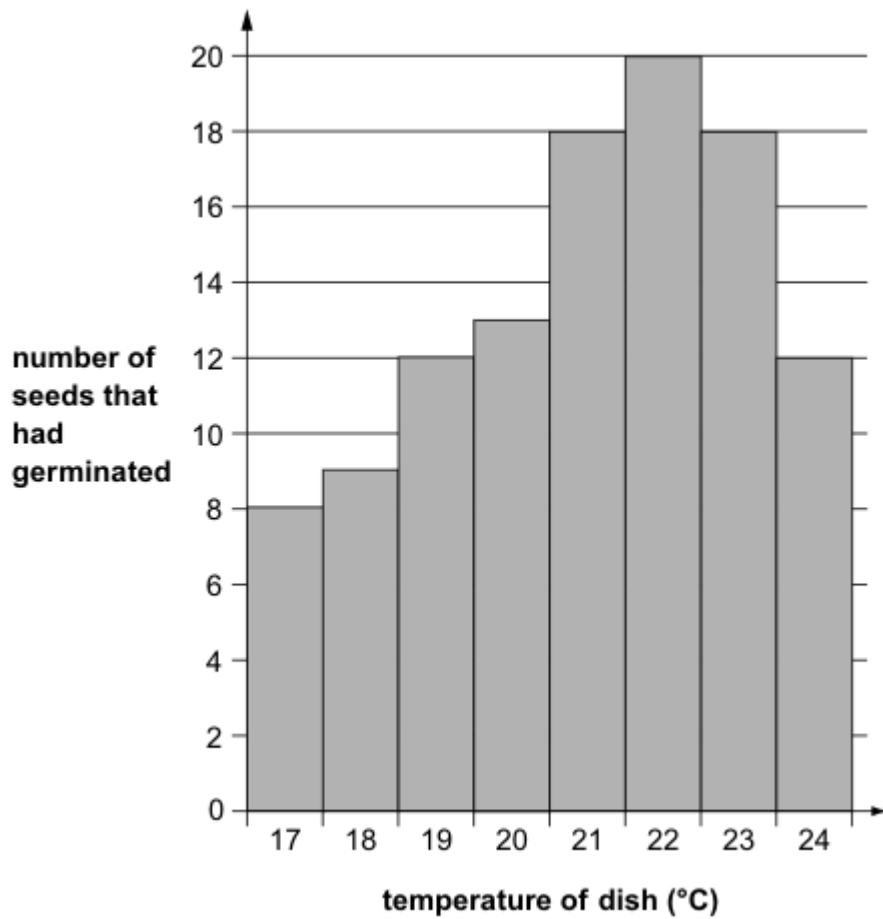
oxygen + \longrightarrow carbon dioxide +

2 marks
maximum 5 marks

- 3.** Abdul put cress seeds on wet filter paper in dishes.
He put 20 seeds in each dish.
Every day he added 5 cm³ of water to each dish.
He kept each dish at a different temperature.



The bar chart below shows how many seeds had germinated after two days.



Use the bar chart to answer the following questions.

(a) (i) How many different temperatures did Abdul use?

.....

1 mark

(ii) What was the lowest temperature Abdul used?

..... °C

1 mark

(iii) How many seeds had germinated at 21°C?

.....

1 mark

- (iv) Abdul said 23°C was better than 21°C for seeds to germinate.
Was he correct?
Tick the correct box.

yes no

Use the bar chart to help you give a reason for your choice.

.....
.....

1 mark

- (v) How does the bar chart show that 22°C is the best temperature for seeds to germinate?

.....
.....

1 mark

- (b) Give **one** way Abdul made sure his investigation was a fair test.

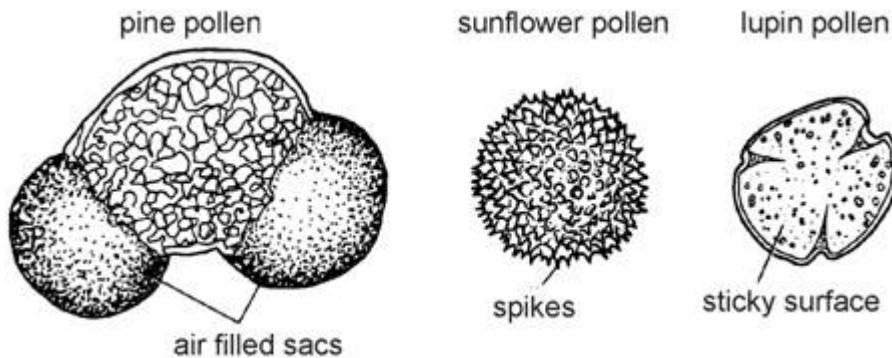
.....

1 mark
maximum 6 marks

4.

Most pollen grains are transferred from one flower to another either by **wind** or by **insects**.

Look at the drawings below which show pollen grains from three different plants.



(a) Using your observations:

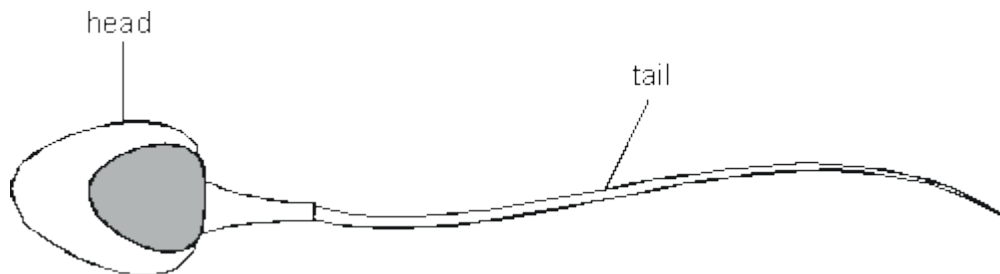
1. State the method by which each of these pollen grains is transferred.
2. Give a careful explanation for the method you have chosen each time.

Write your answers in the table.

name of plant	method by which pollen is transferred	explanation for method chosen
pine		
sunflower		
lupin		

3 marks

The diagram shows a sperm cell.



(b) What is the **function** of each of the following structures in a sperm cell?

(i) Tail

.....

1 mark

(ii) Head

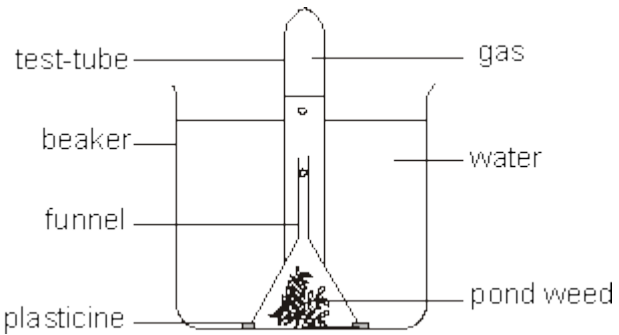
.....

1 mark

Maximum 5 marks

5.

The drawing shows an experiment to investigate photosynthesis in weed from a pond.



Bubbles of gas produced during photosynthesis were given off from the pond weed and collected in the test tube.

(a) Name the gas given off in photosynthesis

.....

1 mark

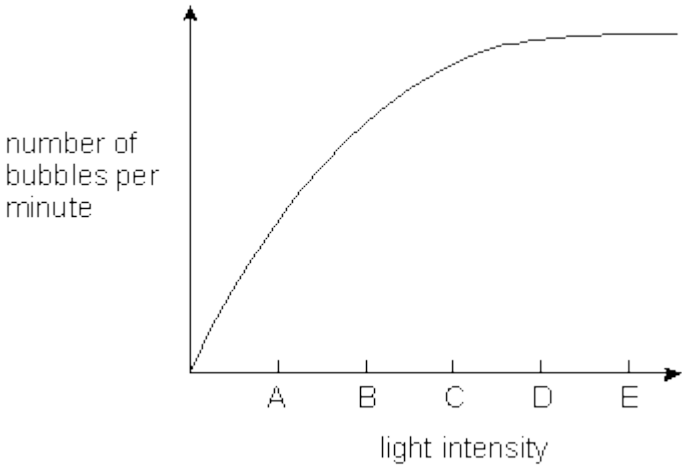
(b) What **two** substances are taken in by the plant and used for photosynthesis?

1.

2.

2 marks

Light of different intensities was shone onto the pond weed. The number of gas bubbles given off in one minute at each light intensity was counted. The results are shown in the graph.



(c) Which letter on the horizontal axis shows the light intensity at which the rate of photosynthesis first reaches its maximum?

.....

1 mark

Blue, green and red light were then shone, in turn, onto the pond weed. The number of bubbles of the gas given off in one minute was counted. The results are shown in the table.

colour of light	number of bubbles in one minute
blue	85
green	10
red	68

The leaves of the pond weed contain a green pigment which absorbs light for photosynthesis

(d) (i) Name this pigment.

.....

1 mark

(ii) Using the information in the table, tick a box by **one** colour of light which is strongly absorbed by the pigment.

blue	<input type="checkbox"/>
green	<input type="checkbox"/>
red	<input type="checkbox"/>

1 mark

(e) Sugar is also produced during photosynthesis.

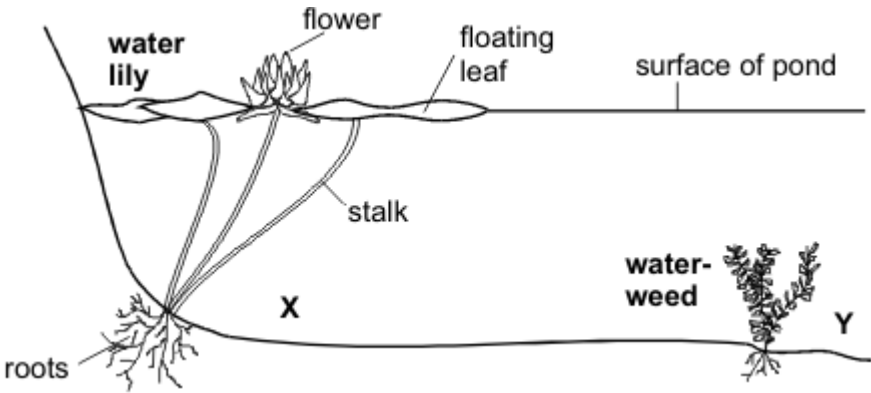
Give **two** ways in which the plant uses sugar.

1.
.....
2.
.....

2 marks
Maximum 8 marks

6.

The drawing shows a water lily and some waterweed growing in a pond.



(a) Waterweed grows well at Y but not at X. Why is this?

Tick the correct box.

- There is not enough food at X.
- There is not enough light at X.
- There is not enough oxygen at X.
- There is not enough water at X.

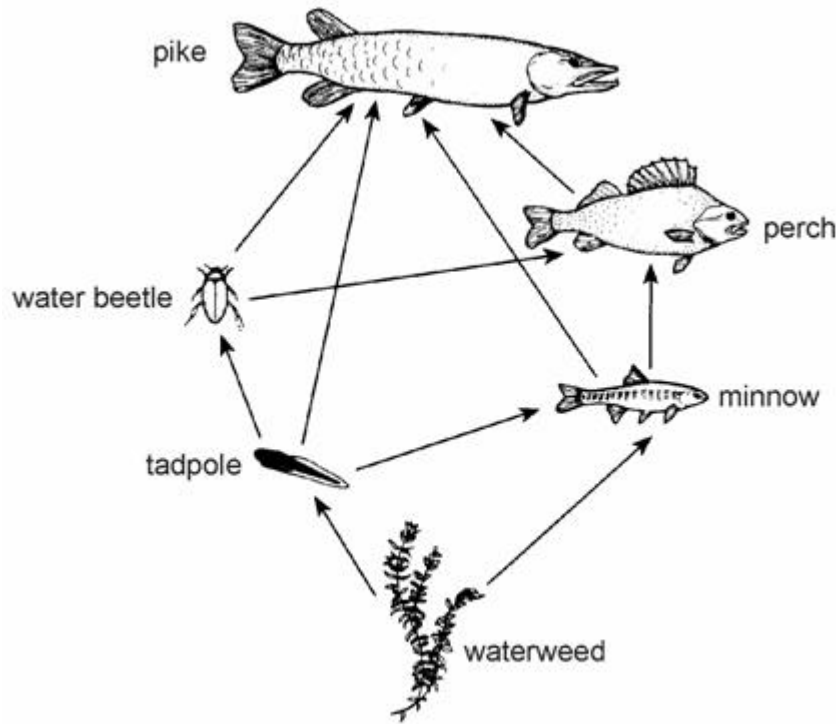
1 mark

(b) Which **named** part of the water lily produces seeds?

.....

1 mark

(c) The drawing shows part of a food web in a pond. Use the information in the drawing to answer the questions.



(i) Write **three** names from the food web to make a food chain which ends with pike.

..... → → → **pike**

1 mark

(ii) Write the name of **one** predator in the food web and the name of **one** of its prey.

Predator:

Prey:

2 marks

(d) Fish have gills and fins. How do these help the fish to live in water?

Gills are for

.....

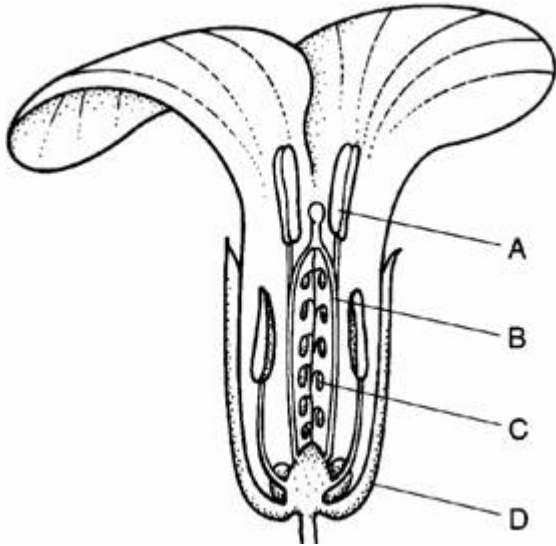
Fins are for

.....

2 marks
Maximum 7 marks

7.

The drawing shows a flower that has been cut in half. A, B, C and D are different parts of the flower.



(a) Put the correct letters in the empty boxes in the table.

part of flower	letter
ovary	
ovule	
sepal	
stamen	

4 marks

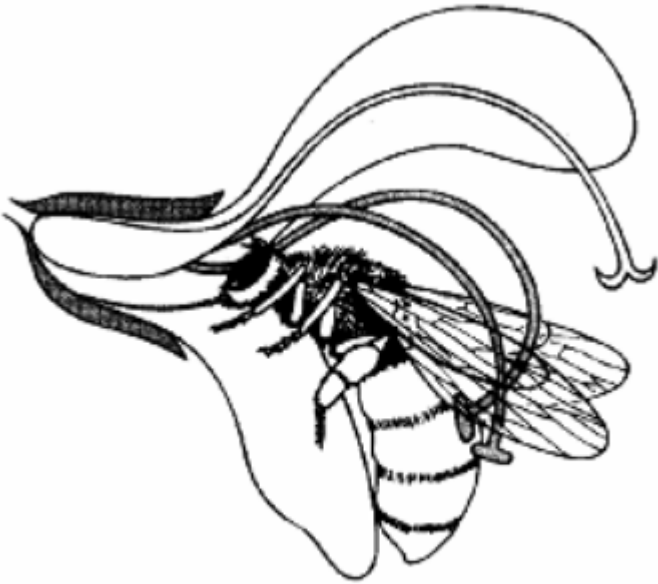
(b) What is the function or job of part A?

.....

1 mark
Maximum 5 marks

8.

The diagram below shows a bee visiting a flower.



X

Y

Z

- (a) (i) Draw a line from the letter **X** to the part of the flower where the seeds are produced. 1 mark
 - (ii) Draw a line from the letter **Y** to a part of the flower where pollen is produced. 1 mark
 - (iii) Draw a line from the letter **Z** to the stigma. 1 mark
- (b) Complete the sentences below by choosing words from the list: 3 marks

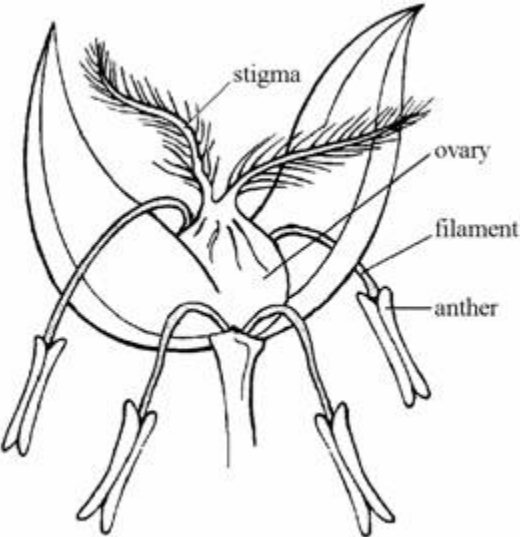
anthers **fertilisation** **germination** **ovule**
pollination **seed production** **sepal** **stigma**

When a bee with pollen on it visits a flower, pollen rubs off the bee onto the of the flower. This process is called A tube grows from each pollen grain until it reaches an ovule. A nucleus of the pollen grain joins with a nucleus in the ovule. This process is called

maximum 6 marks

9.

The drawing shows a single flower of rye grass.



(a) Rye grass flowers are adapted for wind pollination.
 Explain how **two** features, shown on the drawing, show that the flower is adapted for wind pollination.

- 1.
-
-
-
- 2.
-
-
-

2 marks

(b) In a single flower, anthers and stigmas usually mature at different times.
 What is the advantage of this?

-
-

1 mark

(c) Wheat is another member of the grass family. Wheat grain is used to produce flour.

The mass of grain is sometimes used as a measure of the amount of photosynthesis which has taken place in the wheat plant. However, it is better to use the mass of the whole plant as the measure.

Explain why.

-
-

1 mark

Maximum 4 marks

10.

Some pupils grew carrot plants for a project on plant growth. At the end of the summer they dug up the carrots. The drawings show two of their carrots.



- (a) Plant A came from a part of the garden which was covered with weeds. Plant B came from a part of the garden which had been kept free of weeds.

Suggest two ways in which the weeds may have stopped plant A from growing as large and healthy as plant B.

- 1.
.....
- 2.
.....

2 marks

- (b) Explain why the pupils' plants produced bigger roots when they received more light.

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

3 marks
Maximum 5 marks

11.

One product of photosynthesis is glucose, $C_6H_{12}O_6$.

(a) Complete and balance the symbol equation for photosynthesis.



2 marks

(b) Glucose is converted in plants into molecules such as starch.
The formula of starch is $(C_6H_{10}O_5)_n$.

Write the **formulae** of the **two** products of the complete combustion of starch.

1.

2.

1 mark

(c) Octane is a fuel used in aircraft. Burning octane gives the same products as burning glucose. Suggest why.

.....
.....

1 mark

(d) Methane has the formula CH_4 . When very little oxygen is present, burning methane produces carbon monoxide.

Write a balanced symbol equation for this reaction.



2 marks

Maximum 6 marks