Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2015

Biology

Unit 1
Foundation Tier

GBY11

[GBY11]

FRIDAY 5 JUNE, AFTERNOON

TIME

1 hour 15 minutes.

INSTRUCTIONS TO CANDIDATES

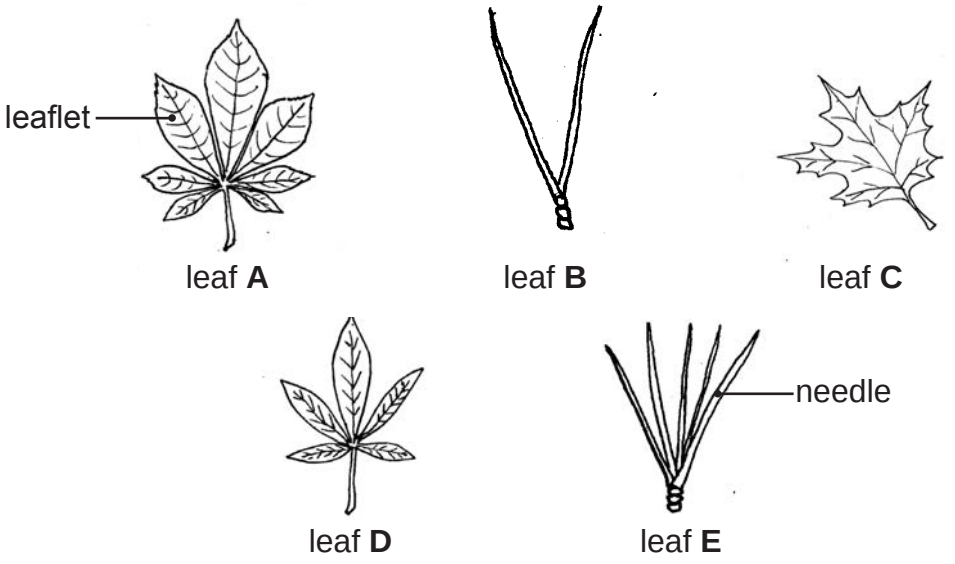
Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
You must answer the questions in the spaces provided.
Do not write outside the boxed area on each page or on blank pages.
Complete in blue or black ink only. **Do not write with a gel pen.**
Answer **all twelve** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 80.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
Quality of written communication will be assessed in Questions **4** and **12**.

28GBY1101

1 The drawings show leaves from five species of tree.



Look at the drawings.

(a) Use the key to identify which leaves belong to Maple, Jack pine and Buckeye trees.

Write the correct letter in each box.

1.	Leaf made up of needles	go to 2	
	Leaf not made up of needles	go to 3	
2.	Leaf made up of two needles	*Jack pine*.....	☐
	Leaf made up of five needles	*White pine*	
3.	Leaf made up of leaflets	go to 4	
	Leaf not made up of leaflets	*Maple*.....	☐
4.	Leaf made up of five leaflets	*Buckeye*.....	☐
	Leaf made up of seven leaflets	*Horse Chestnut*	

[3]

(b) Trees belong to the plant kingdom.

Give **one** feature found **only** in the plant kingdom.

_____

_____ [1]

2 Carbohydrates, fats and proteins are food groups found in a balanced diet.

(a) Name **one** element contained in all these food groups.

_____ [1]

(b) The lists give three foods and five food groups.

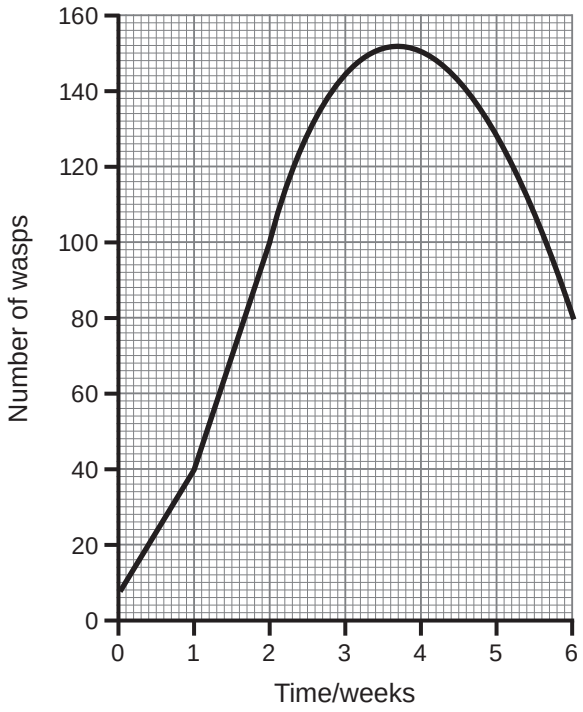
Each food is made up of one main food group.

Draw lines to link each food to its **main** food group.

Type of food	Food Group
	fat
potato	protein
butter	mineral
chicken	carbohydrate
	vitamin

[3]

3 The graph shows changes in the number of wasps in a population over six weeks.



Look at the graph.

(a) (i) **Describe the trend** in the number of wasps in the population from 0 to 3 weeks.

_____ [1]

(ii) Use the terms birth rate and death rate to explain the trend between 0 and 3 weeks.

_____

_____ [1]

(b) (i) **Describe the trend** in the number of wasps in the population from 4 to 6 weeks.

_____ [1]

(ii) The changes in the wasp population between 4 and 6 weeks are caused by an increase in the death rate.

Give two factors that increase the death rate.

1. _____

2. _____ [2]

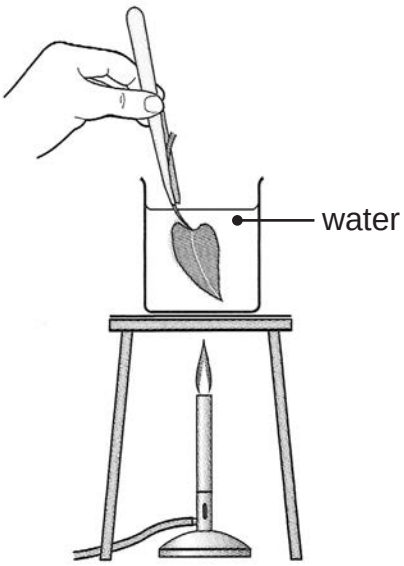
(iii) Suggest what might happen to the wasp population if this trend continues after six weeks.

_____

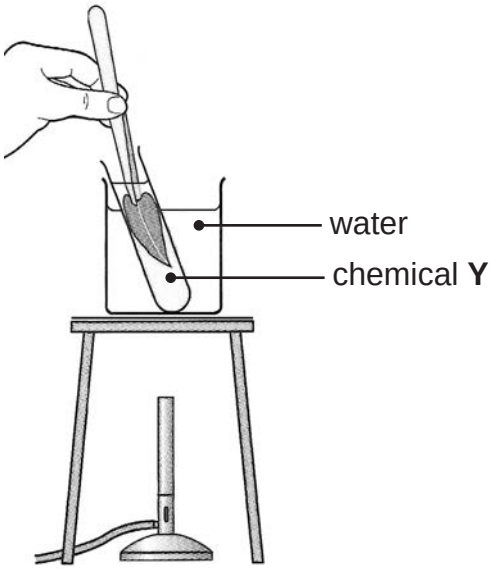
_____ [1]

[Turn over

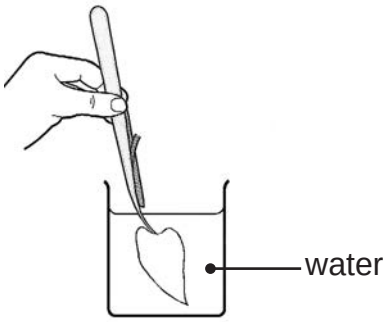
4 The diagrams show the steps used to test a leaf for starch.



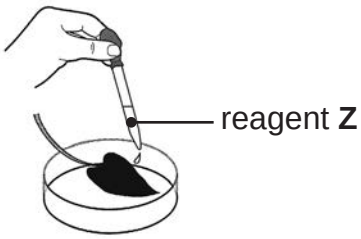
step 1



step 2



step 3



step 4

Look at the diagrams.

Use the information in the diagrams to help you to describe and explain what is happening during each step.

- Name any chemicals or reagents used.
- Explain why each step is carried out.
- Describe any safety precautions needed.

In this question you will be assessed on your written communication skills, including the use of specialist scientific terms.

_____

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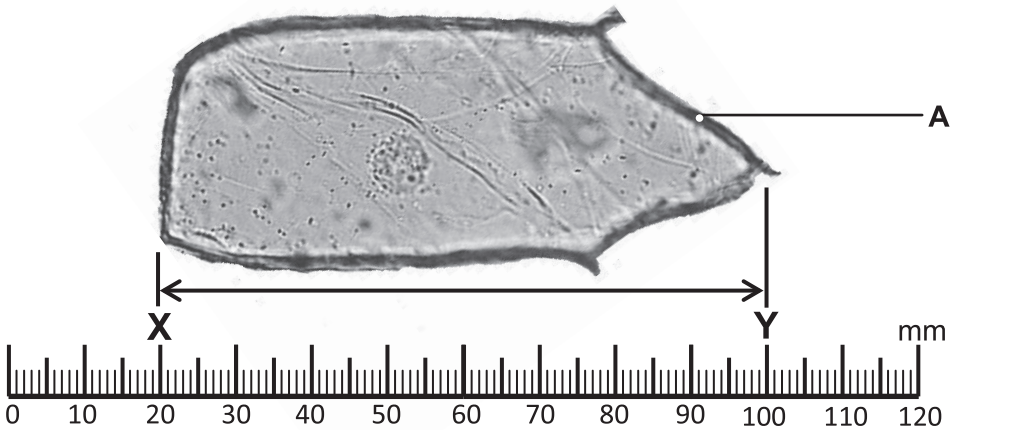
_____ [6]

[Turn over

5 The photograph shows a magnified onion cell.



Look at the photograph.

(a) Name part **A**.

A _____ [1]

(b) **(i)** Use the scale provided to measure the length of the cell in the photograph along the line **X–Y**.

_____ mm [1]

(ii) The cell in the photograph is magnified 200 times.

The actual length of a cell can be calculated using the formula

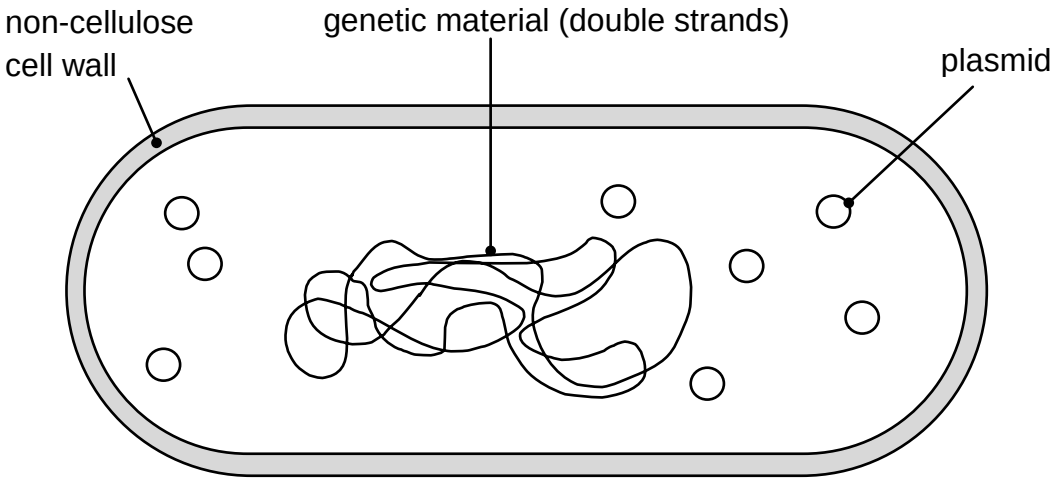
$$\text{actual length of cell} = \frac{\text{length of cell in photograph}}{\text{magnification}}$$

Calculate the actual length of this onion cell.
Show your working.

Actual length of cell. _____ mm [2]

The diagram shows another type of cell.

It has been magnified 70 000 times.



(c) How does the actual size of this cell compare to the actual size of the onion cell?

_____ [1]

(d) Give two **other** ways this cell differs from the onion cell.

1. _____

_____ [1]

2. _____

_____ [1]

(e) Use the information in the diagram to suggest the name of this type of cell.

Draw a circle around the correct answer.

leaf **bacterium** **cheek** **root hair** [1]

[Turn over

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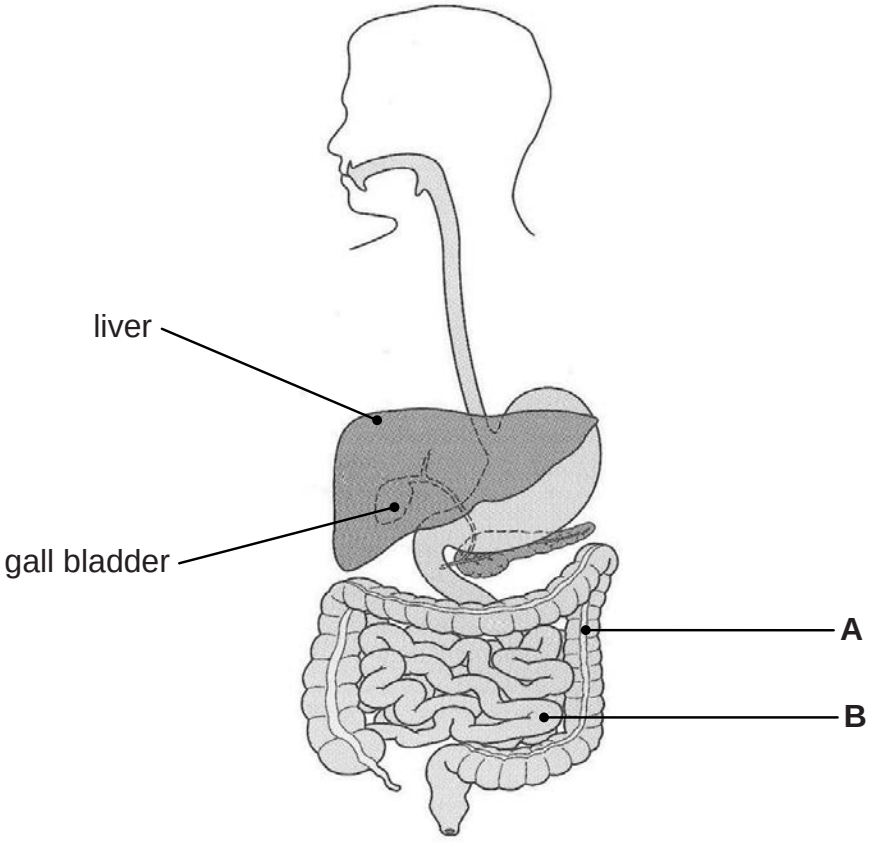
6 The diagram shows part of the digestive system.



Look at the diagram.

(a) (i) Name parts **A** and **B**.

A _____ [1]

B _____ [1]

Gastric juice is produced by one part of the digestive system.
It contains chemicals that help digest proteins.

(ii) **Write the letter G** on the diagram to show the part of the digestive system that produces gastric juice. [1]

[Turn over

(iii) Name **two** of the chemicals in gastric juice that help the digestion of proteins.

Draw (circles) around the correct answers.

mucus **acid** **protease** **amylase** [2]

(b) Bile helps digest fats.

(i) Name the organ that produces bile.

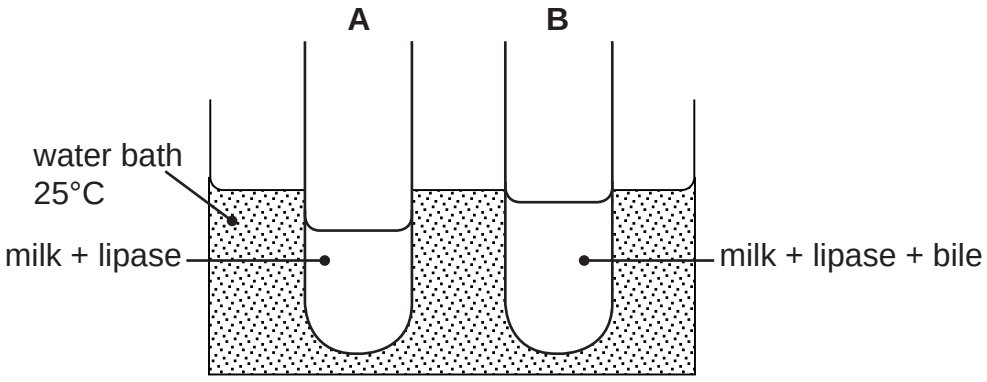
_____ [1]

An experiment was set up to investigate the effect of bile on the action of lipase.

Two test tubes containing milk and lipase were placed in a water bath at 25°C.

Bile was added to test tube B.

The time taken to digest the fat in the milk was recorded.



(ii) What should be added to test tube A to make this a fair test?

_____ [1]

The results are shown in the table.

Test tube	Time taken to digest fat/min
A	30
B	10

(iii) What can you conclude from these results?

_____

_____ [1]

The diagram shows bile emulsifying a single large fat droplet.

single large fat droplet

Look at the diagram.

(iv) Describe what happens when fats are emulsified.

_____

_____ [1]

(v) Explain how emulsification helps lipase digest fats.

_____

_____ [1]

[Turn over

7 **(a)** The nervous system and hormonal system use signals which enable one part of the body to communicate with another.

(i) Name the type of signal used in each system.

Nervous _____ [1]

Hormonal _____ [1]

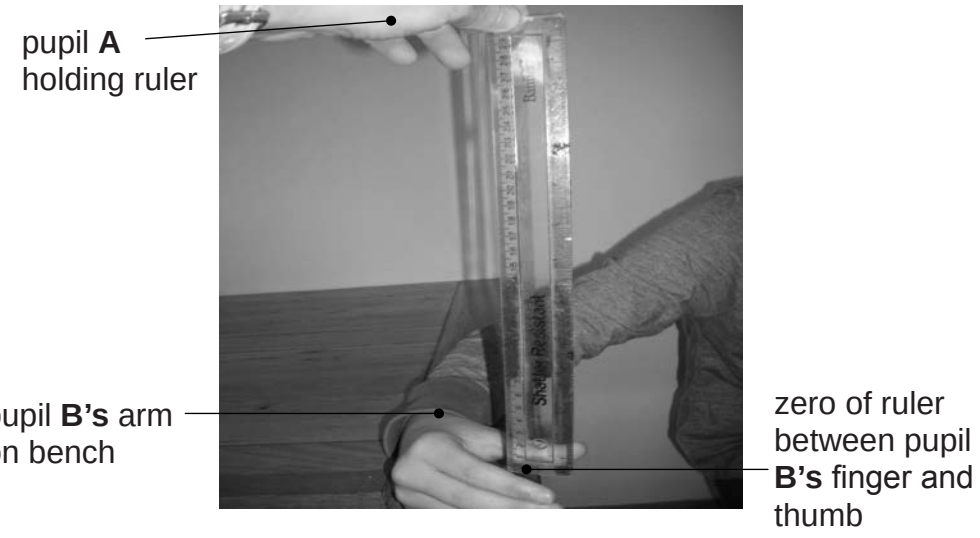
(ii) The two systems also differ in the speed of their response.

Describe how the speeds differ.

_____

_____ [1]

(b) The photograph shows an experiment to find if reactions can be improved with practice.



When pupil **A** drops the ruler, pupil **B** catches it between their finger and thumb.

The distance the ruler drops before being caught is a measure of how fast pupil **B** reacts.

The experiment was repeated three times for each of four pupils.

(i) What was the dependent variable in this experiment?

_____ [1]

(ii) Give **one** way the pupils kept this a fair test.

_____

_____ [1]

The results are shown in the table.

Pupil	Distance ruler dropped/mm			
	Test 1	Test 2	Test 3	Average
A	150	95	85	110
B	210	200	190	200
C	244	210	140	198
D	195	125	115	145

Look at the table.

(iii) Which pupil had the fastest average reaction?

Pupil _____ [1]

(iv) Which pupil's results varied the least?

Pupil _____ [1]

(v) **Use data from the table** to explain if reactions improved with practice.

_____

_____

_____

_____ [3]

[Turn over

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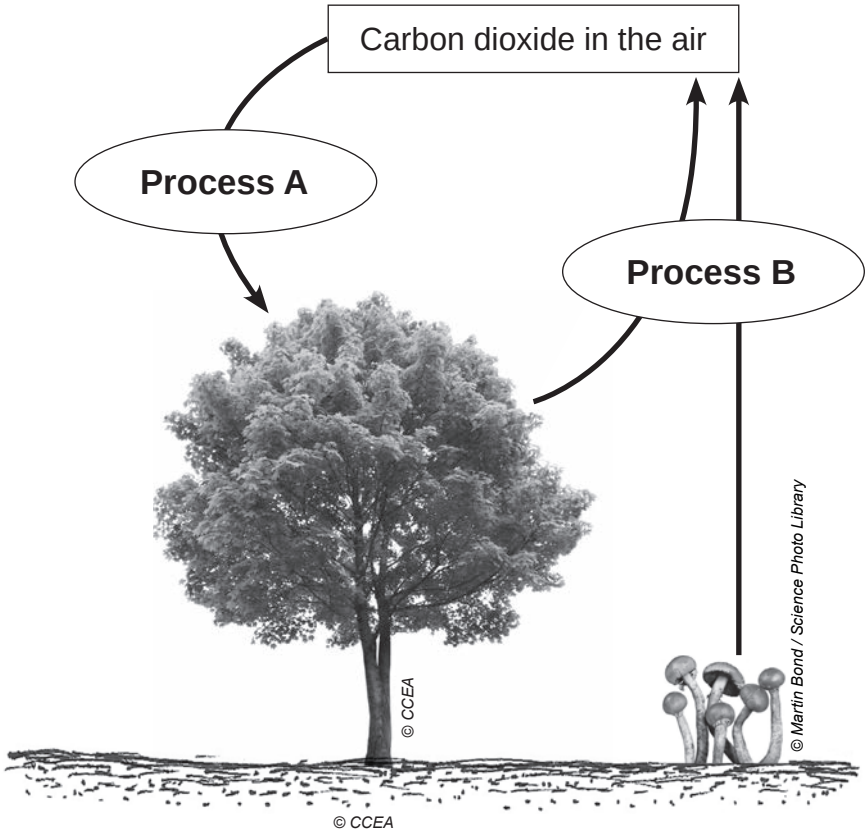
8 The diagram shows part of the carbon cycle in a woodland.



© CCEA

Look at the diagram.

(a) Name processes **A** and **B**.

A _____ [1]

B _____ [1]

(b) Students set up an experiment to compare the rate of decomposition of beech and holly leaves.

Samples of the leaves were weighed and placed in two net bags which had a fine mesh.

One bag contained beech leaves and one bag holly leaves.

The net bags were left under a tree in the woodland.

The leaves in each bag were weighed every 50 days.

The percentage mass of the leaves remaining was calculated.

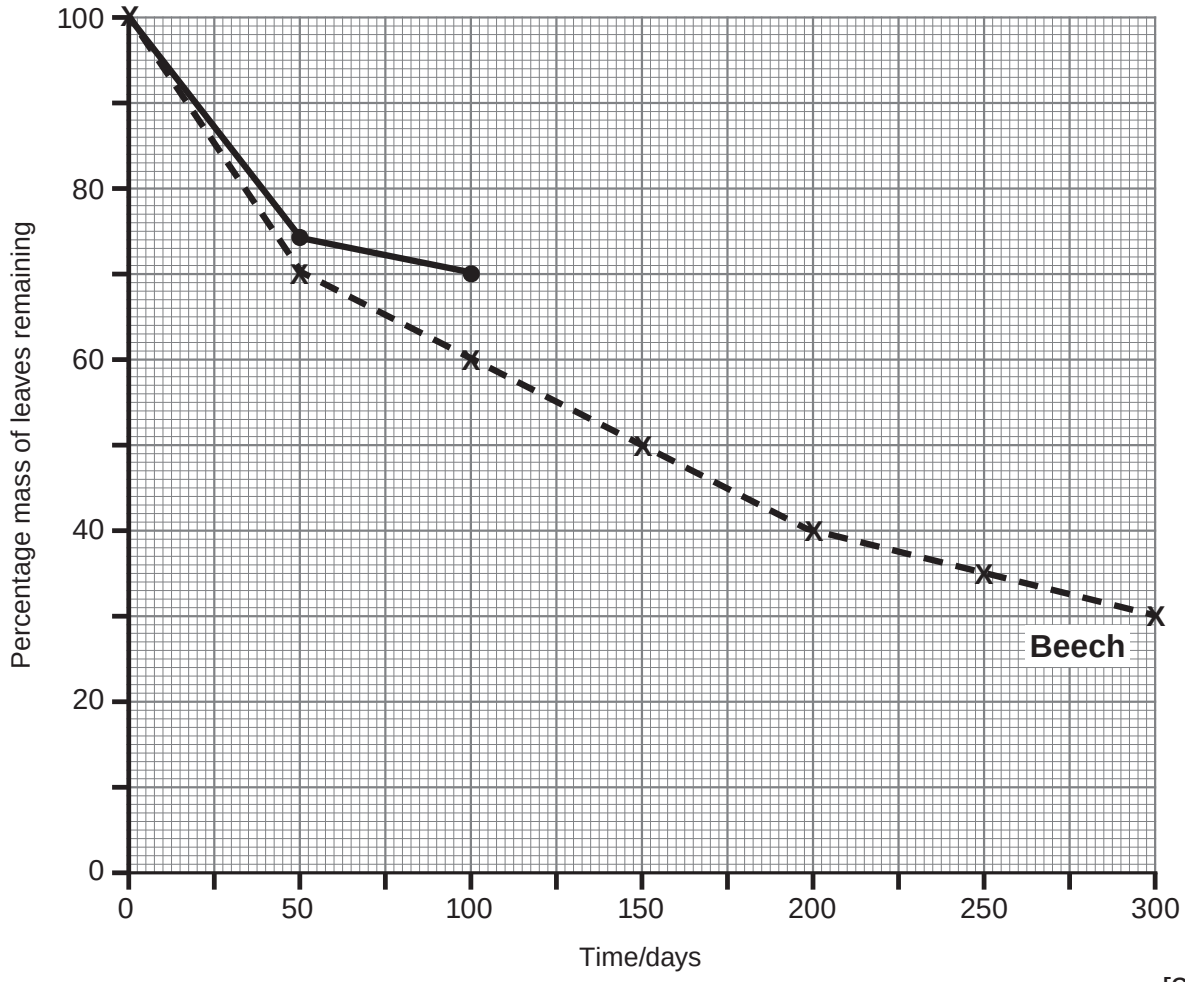
[Turn over

The results are shown in the table.

Day	Percentage mass of leaves remaining	
	Beech	Holly
0	100	100
50	70	75
100	60	70
150	50	65
200	40	60
250	35	55
300	30	50

(i) Complete the graph by plotting the results for holly.

The first three points have been done for you.



[3]

Look at the graph.

(ii) **Use data from the graph** to describe which type of leaf decomposed faster.

_____

_____

_____

_____

_____ [3]

Fungi in the net bags helped decompose the leaves.

(iii) What term is used to describe fungi which decompose dead material?

Draw a (circle) around the correct answer.

consumers **saprophytes** **producers** [1]

(iv) Another group of organisms could have helped decompose the leaves in the net bags with a fine mesh.

Name this group.

_____ [1]

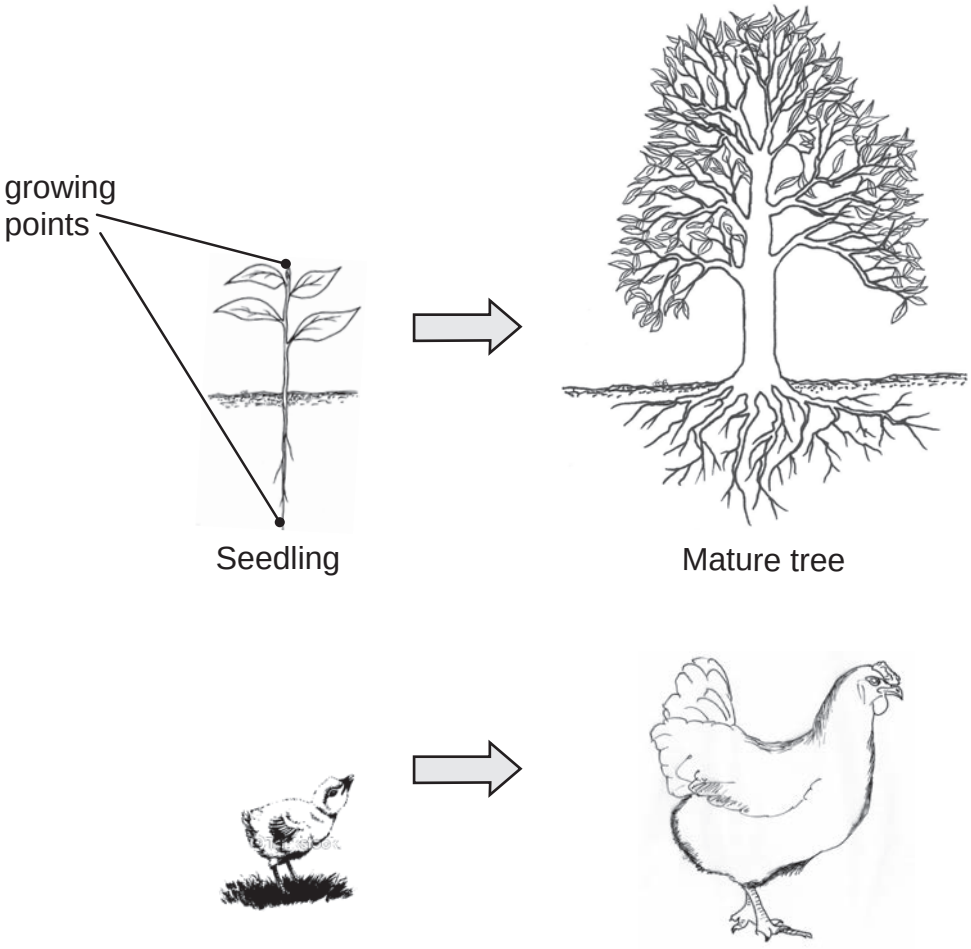
(v) What is formed in the soil by the decomposition of dead leaves?

_____ [1]

[Turn over

9 Animals grow differently from plants.

The drawings show the growth of a seedling to a mature tree and a chick to a chicken.



Look at the drawings.

(a) Use the drawings to compare the patterns of growth of a seedling and a chick.

_____

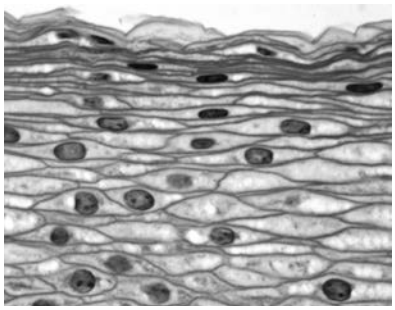
_____

_____

_____ [3]

(b) Organisms are made up of cells which group together to form different tissues which have higher levels of organisation.

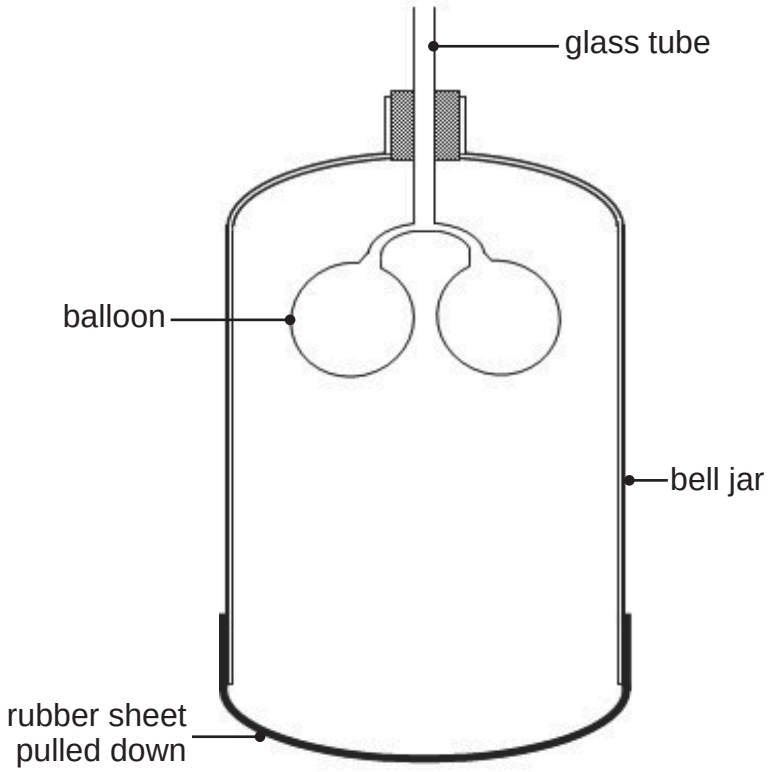
Complete the table to show which level of organisation describes each body part shown.

Body part	Level of organisation
 *Dr Gladden Willis/Visuals Unlimited/ Science Photo Library*	tissue
 *© 3drenderings/ iStock/ Thinkstock*	
 *© Anna Omelchenko/ iStock/ Thinkstock*	

[2]

[Turn over

10 The diagram shows a model of the respiratory system.



Look at the diagram.

(a) Name the parts of the **respiratory system** represented by the glass tube and the rubber sheet.

glass tube _____ [1]

rubber sheet _____ [1]

(b) **Describe and explain** what would happen to the balloons if the rubber sheet was **pushed up**.

Description _____

_____ [1]

Explanation _____

_____

_____ [2]

11 A student wanted to compare the number of flying insects in two areas of long grass.

(a) **(i)** Describe how he could use a net to sample the flying insects in each area.

_____

_____

_____ [2]

(ii) Explain what he should do to make sure the results for the two areas can be compared.

_____

_____

_____ [2]

(b) What apparatus can be set up and left for twenty four hours to collect crawling insects in long grass?

_____ [1]

[Turn over

12 The table shows the results of food tests carried out on a biscuit.

Test reagent	Reagent colour at start	Result of food test
Benedict's	blue	positive
Ethanol	clear	positive
Biuret	blue	negative
Iodine	yellow/brown	positive

Look at the table.

Use the information in the table to draw conclusions about the types of food in the biscuit.

Describe the colour change for each food test.

In this question you will be assessed on your written communication skills, including the use of specialist scientific terms.

_____

_____

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_____ [6]

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For Examiner's use only	
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Examiner Number