New Specification

Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2018–2019

Double Award Science
Biology

Unit B1
Foundation Tier

MV18

[GDW11]

WEDNESDAY 7 NOVEMBER 2018, MORNING

Time

1 hour, plus your additional time allowance.

Instructions to Candidates

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all nine** questions.

Information for Candidates

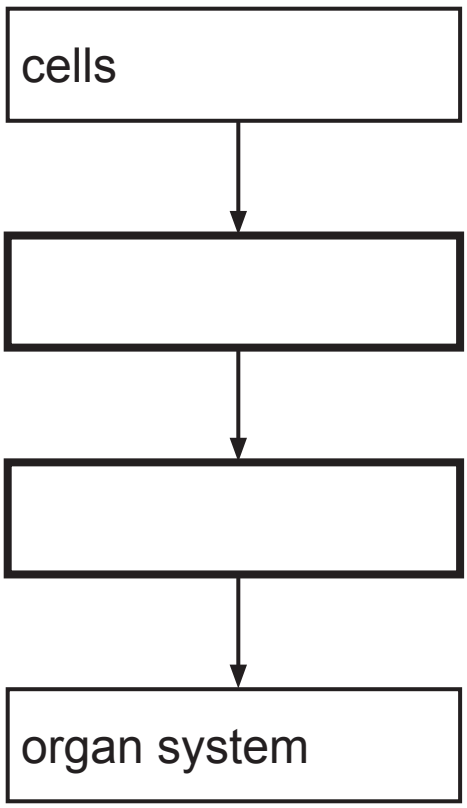
The total mark for this paper is 60.
Figures in brackets printed at the end of each question indicate the marks awarded to each question or part question.
Quality of written communication will be assessed in Question **9**.

1 A cell wall is present in some types of cell.

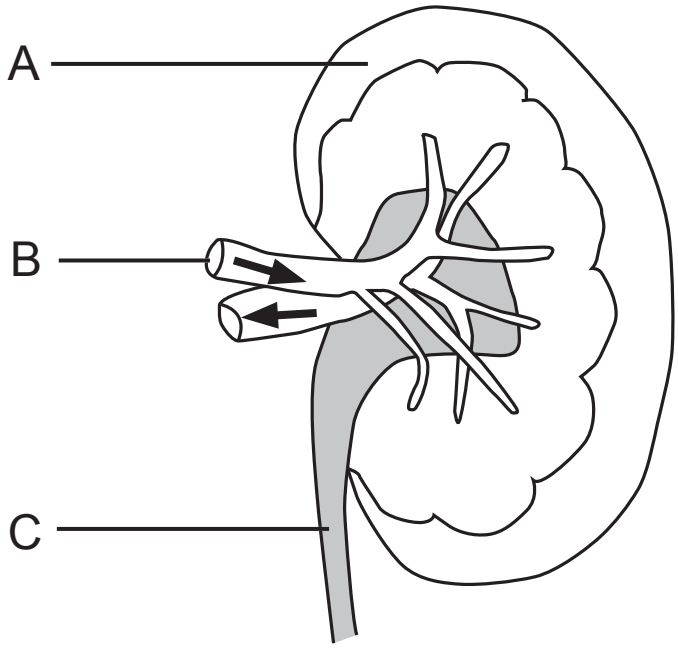
(a) On the diagram, draw a line to link each type of cell to the information. [2 marks]

Type of cell	Information
animal cell	has a non-cellulose cell wall
bacterial cell	has a cellulose cell wall
plant cell	has no cell wall

(b) Complete the diagram below by writing in the empty boxes to show how cells are organised in plants and animals. [2 marks]



(c) The diagram shows an organ with its blood vessels.



(i) Name this organ. [1 mark]

_____

(ii) Name A. [1 mark]

_____

(iii) Name C. [1 mark]

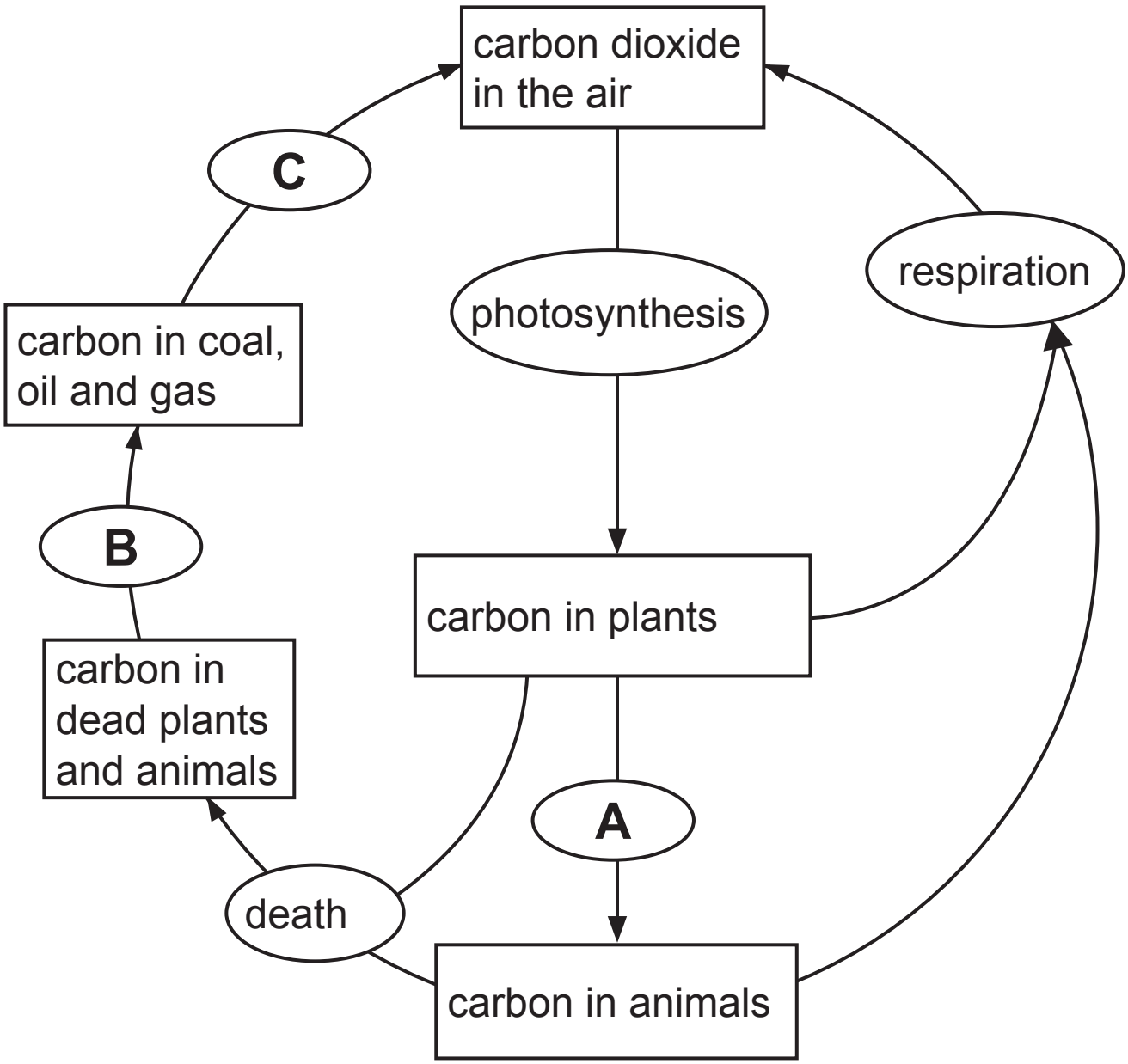
_____

Blood vessel B carries blood **to** the organ.

(iv) Name blood vessel B. [1 mark]

_____

2 The diagram shows the carbon cycle.



(a) Name processes **A**, **B** and **C**. [3 marks]

A _____

B _____

C _____

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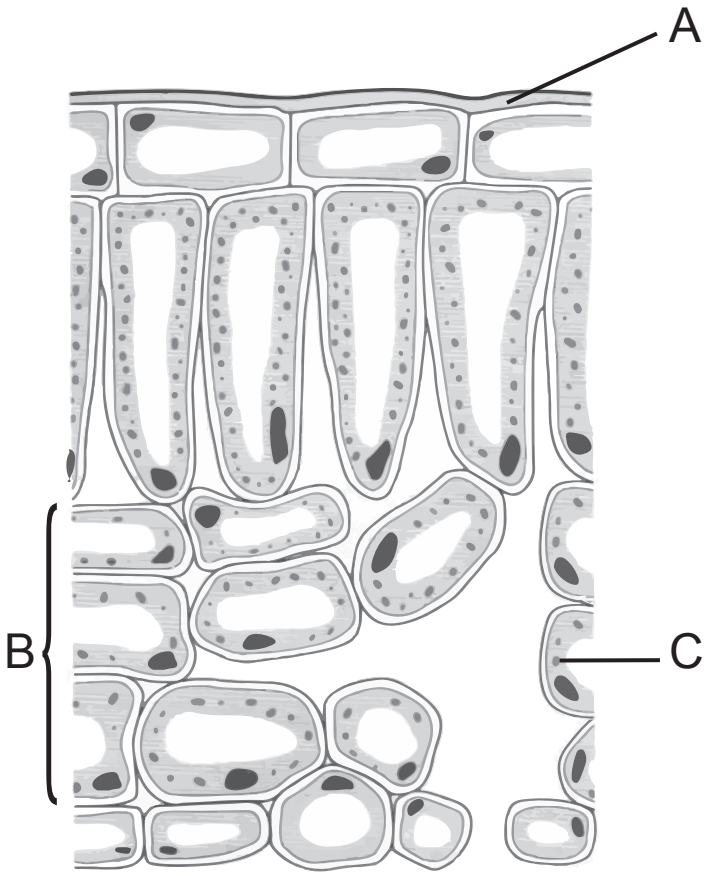
(Questions continue overleaf)

3 The leaves of plants carry out photosynthesis.
The diagram shows a section of a leaf.



(a) Write the names of parts A, B and C in the empty boxes in the table below. [3 marks]
Choose the correct names from the list.

chloroplast	spongy mesophyll	vacuole
epidermis	palisade mesophyll	waxy cuticle

Part	Name of part
A	
B	
C	

(b) Most photosynthesis takes place in one layer of leaf cells.

(i) Draw a line, labelled **X**, on the diagram opposite to show one of the cells in this layer. [1 mark]

(ii) Explain why most photosynthesis takes place in the cells in this layer. [1 mark]

_____

_____

(c) The table below shows the number of stomata found on the same area of lower leaf surface of four types of plant.

Type of plant	**Number of stomata**
geranium	180
sunflower	115
oak	360
horse chestnut	230

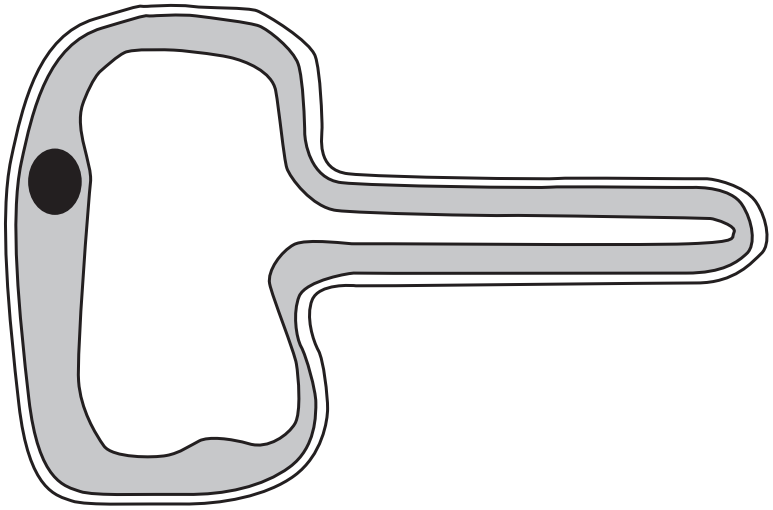
(i) Use the information in the table to name the type of plant that has 50% fewer stomata than an oak leaf. [2 marks]

Show your working.

Type of plant _____

(ii) Describe and explain the advantage to a plant of having more stomata. [2 marks]

(d) The diagram below shows a root hair cell.



(i) Describe how this cell is adapted to give a large surface area for absorption. [1 mark]

(ii) Name **two** substances a root hair cell absorbs from the soil. [2 marks]

1 _____

2 _____

4 Glucose is a substance that is used in respiration.

(a) What type of carbohydrate is glucose? [1 mark]

_____

(b) Three word equations, A, B and C, for respiration are given in the box below.

A	glucose + oxygen ⟶ carbon dioxide + water + energy
B	glucose ⟶ lactic acid + energy
C	glucose ⟶ carbon dioxide + alcohol + energy

Two word equations show anaerobic respiration and one word equation shows aerobic respiration.

(i) Give the letter of the word equation showing aerobic respiration. [1 mark]

_____

(ii) Use information from the word equations to explain your choice. [1 mark]

_____

_____

(c) Give **two** uses for the energy released during respiration. [2 marks]

1 _____

2 _____

5 The hormonal system and the nervous system are two communication systems in the human body.

The table below gives information about these two communication systems.

Complete the table by writing in the empty boxes.
[3 marks]

Communication system	Speed of response **Slow or Fast**	Uses a chemical messenger **Yes or No**	Message is carried in the blood **Yes or No**
Hormonal			
Nervous			

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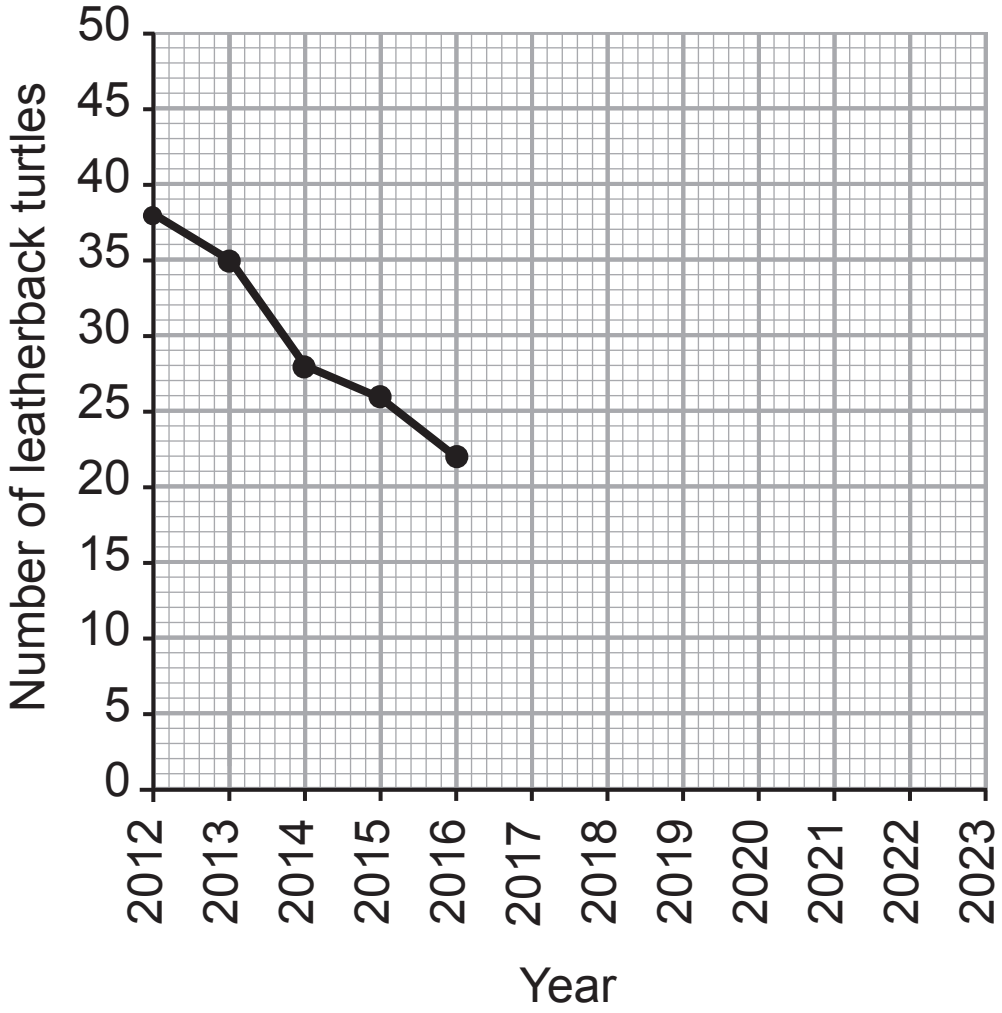
(Questions continue overleaf)

6 Leatherback turtles live in the sea. Female leatherback turtles make short trips onto beaches at night time to lay eggs.
The photograph below shows a leatherback turtle.

Scientists recorded the number of leatherback turtles they saw on a beach in Costa Rica during the breeding season each year from 2012 to 2016.

The graph below shows the scientists' results.



Use the information from the graph opposite to answer the following questions.

(a) Describe the overall trend for the number of leatherback turtles from 2012 to 2016. [1 mark]

_____

_____

(b) Assume that the trend in the number of leatherback turtles continues at the same rate as **2015 to 2016**.

(i) Draw a line on the graph to predict the first year when **no** leatherback turtles will visit this beach. [1 mark]

(ii) Give this year. [1 mark]

Year _____

(c) Suggest **one** human activity that could affect the number of leatherback turtles. [1 mark]

_____

_____

(d) Give **one abiotic** factor that could affect the number of leatherback turtles. [1 mark]

_____

_____

(e) Give **two** resources the leatherback turtles compete for. [2 marks]

1 _____

2 _____

7 **(a)** A scientist investigated the effect of ripening on the starch and glucose content of bananas.

The photographs show bananas at four stages of ripeness.

Stage 1

Green, unripe and hard.

Stage 2

Yellow

Stage 3

Brown spots

Stage 4

Brown, overripe and soft

The scientist cut two 1 cm thick slices from a banana at each stage of ripeness.
She tested one slice for starch and one slice for glucose.

(i) Name the food test reagent the scientist used to test for **starch** and give the colour change expected for a positive result. [2 marks]

Reagent _____

Colour change: yellow-brown to _____

(ii) Name the food test reagent the scientist used to test for **glucose** and give the colour change expected for a positive result. [2 marks]

Reagent _____

Colour change: blue to _____

(b) The table below shows the starch and glucose content in the bananas at each stage of ripeness.

Stage of ripeness	Starch content	Glucose content
1	high	none
2	medium	low
3	low	medium
4	none	high

(i) Use the results in the table above to describe the change in the glucose content from stage 1 to stage 4. [1 mark]

_____

_____

(ii) Suggest a reason for this change. [2 marks]

_____

_____

_____

_____

Bananas contain an enzyme that causes them to ripen.

(c) Use your knowledge of enzymes to explain why bananas kept in a fridge at 4 ºC will take longer to ripen than bananas kept at room temperature. [3 marks]

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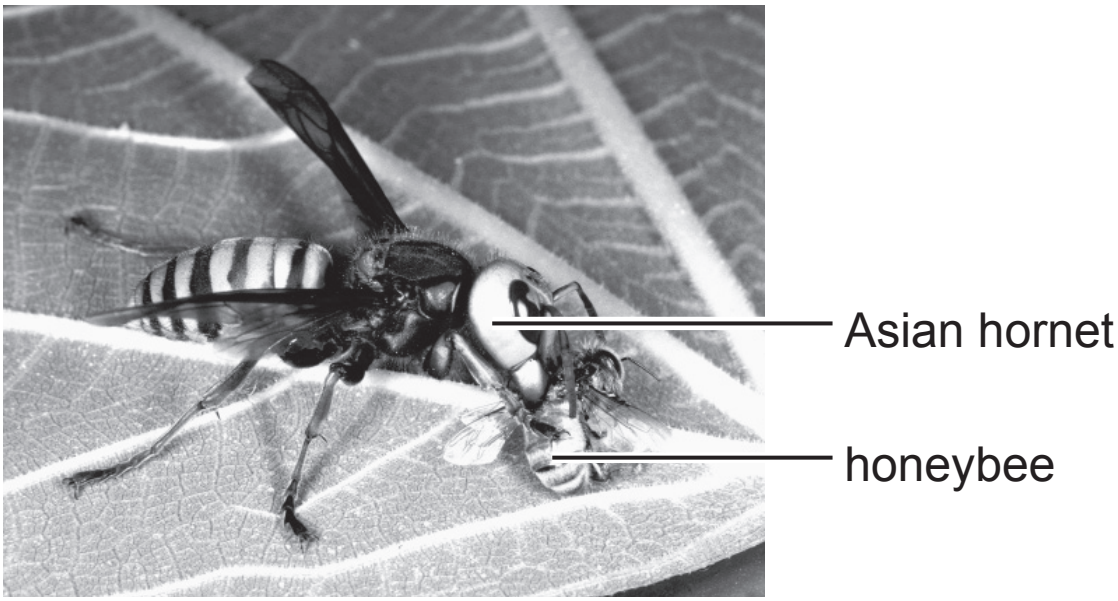
(Questions continue overleaf)

8 The photograph shows an Asian hornet and a honeybee.



Read the passage below and answer the questions that follow.

Honeybees feed on nectar from plants.
Beekeepers, gardeners and the public in Northern Ireland are being asked to be on the lookout for invading Asian hornets that feed on honeybees.
Asian hornets have been seen in England but not yet in Northern Ireland.
In England, their nests have been destroyed by experts as soon as they are found.

One Asian hornet nest contains 6000 hornets.
One Asian hornet kills 50 honeybees in one day.

(a) In the space below draw a food chain containing **three** organisms from the passage. [2 marks]

(b) (i) Calculate how many honeybees can be killed by 6000 hornets in one day. [1 mark]

_____ honeybees

(ii) A beekeeper has 10 beehives each containing 60 000 honeybees.

Use your answer from part **(b)(i)** to calculate how long it could take for 6000 hornets to kill all the honeybees owned by this beekeeper. [2 marks]

Show your working.

_____ days

(c) Suggest why Asian hornets' nests are destroyed as soon as they are found. [1 mark]

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(Questions continue overleaf)

9 Diabetes affects a large number of people worldwide. There are two types of diabetes.

Describe the **two** types of diabetes. [6 marks]

Include in your answer:

- the name of each type of diabetes
- the difference in insulin production in each type of diabetes
- how each type of diabetes can be controlled.

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

THIS IS THE END OF THE QUESTION PAPER

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Question Number	**Marks**
1	
2	
3	
4	
5	
6	
7	
8	
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Total Marks	