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BIOLOGY **0610/31**

Paper 3 Theory (Core) **May/June 2026**

1 hour 15 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS
- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen. Do **not** use correction fluid or tape.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

INFORMATION
- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **24** pages. Any blank pages are indicated.

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1 **(a)** Figure 1.1 is a photograph of an amphibian *Bombina variegata*.

View solution



Figure 1.1

(i) State the genus name of the amphibian shown in Figure 1.1.

..... [1]

(ii) State the name of the kingdom the amphibian in Figure 1.1 belongs to.

View solution

..... [1]

(b) Table 1.1 shows some features of amphibians and reptiles.

View solution

Complete Table 1.1 by placing ticks (✓) in the boxes to show whether each feature is typical of amphibians or reptiles or both.

Table 1.1

feature	amphibians	reptiles
scales		
lungs		
laying eggs		

[3]

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(c) State the feature used to identify amphibians and reptiles as vertebrates.

..... [1]

(d) State the names of **two** vertebrate groups, **other than** amphibians and reptiles.

View solution

1 .....

2 .....

[2]

[Total: 8]

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2 **(a)** A student investigated the effect of wind speed on the rate of transpiration.

The student used the apparatus shown in Figure 2.1. The student calculated the rate of water uptake by a plant shoot when a fan was placed next to the shoot.

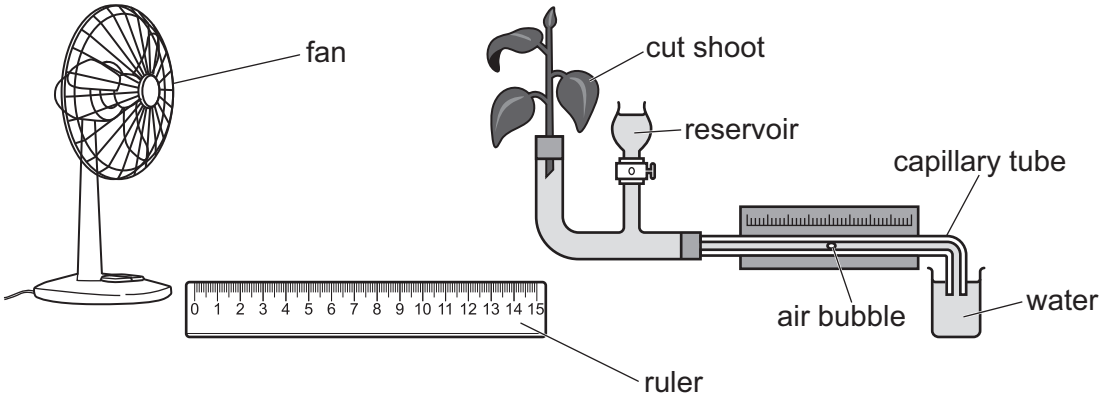

Figure 2.1

The investigation was repeated with the fan at different distances from the shoot.

The rate of water uptake is approximately equivalent to the rate of transpiration.

Figure 2.2 shows the results.

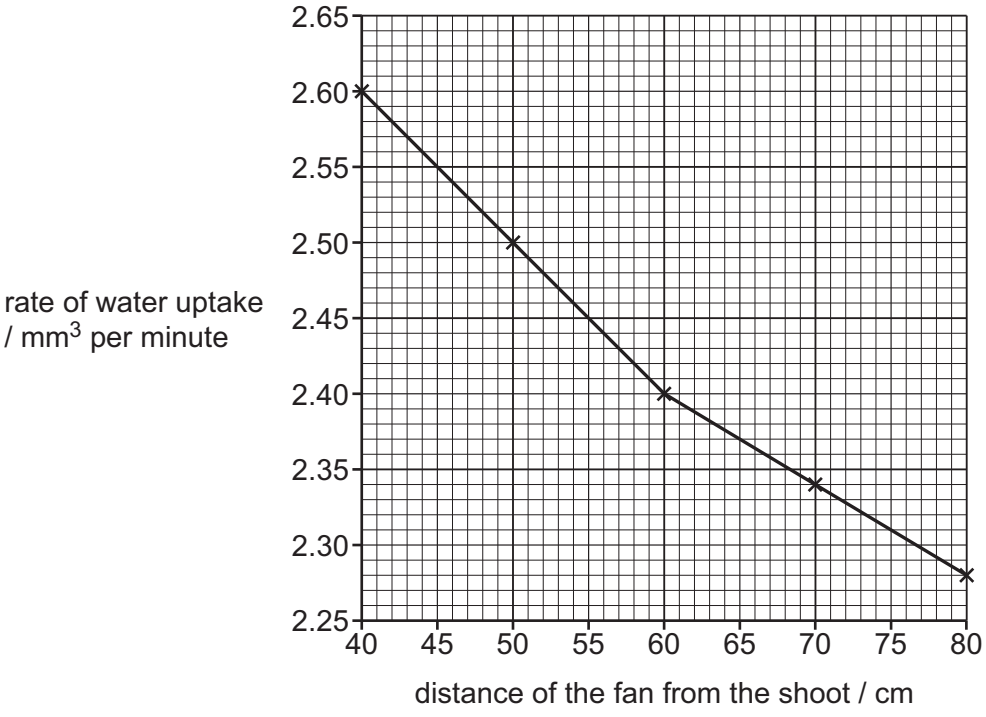

Figure 2.2

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(i) Complete the sentences to describe the results shown in Figure 2.2.

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The rate of water uptake at 40 cm was 2.60 mm^3 per minute.

The rate of water uptake at 80 cm was ..... mm^3 per minute.

The difference in rate of water uptake between 40 cm and 80 cm was

..... mm^3 per minute.

The student concluded that an increase in the wind speed ..... the rate of transpiration.

[3]

(ii) State why the temperature was kept constant during this investigation.

View solution

.....

.....

..... [1]

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(b) Figure 2.3 is a diagram of part of a cross-section of a leaf.

View solution

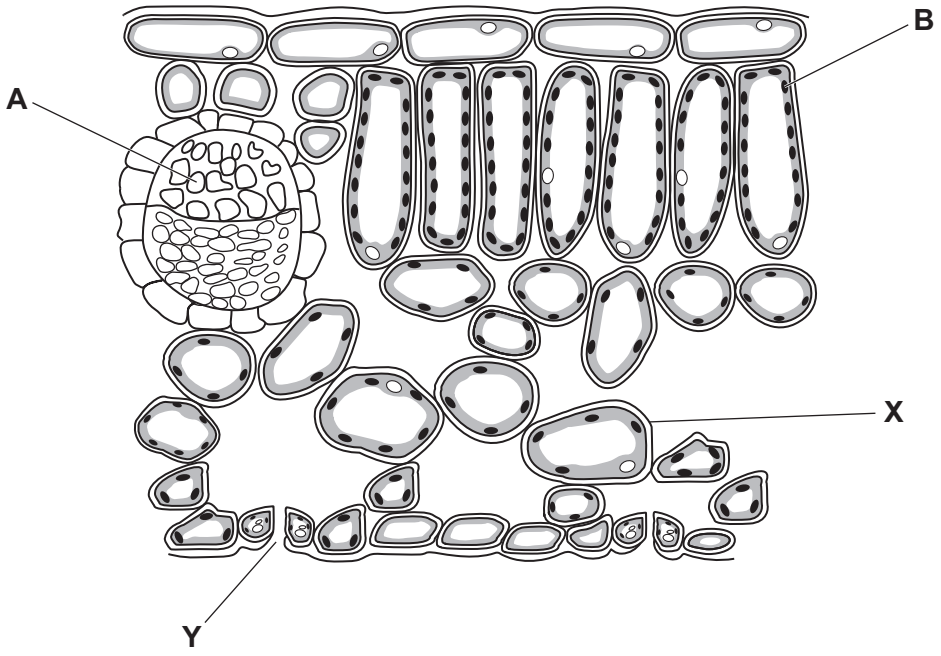

Figure 2.3

(i) State the function of the parts labelled **A** and **B** in Figure 2.3.

A .....

.....

B .....

.....

[2]

(ii) State the names of the processes that occur during transpiration at **X** and **Y** in Figure 2.3.

View solution

X .....

Y .....

[2]

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(c) Water is absorbed by the roots and transported to the leaves.

View solution

(i) State the names of **two** types of cell that water passes through in the root.

1 .....

2 .....

[2]

(ii) Water is a liquid that dissolves substances.

View solution

State the name given to liquids that can dissolve substances.

..... [1]

[Total: 11]

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3 **(a)** A student investigated the conditions required for seed germination.

View solution

Sets of seeds were kept in different conditions in separate tubes.

Seeds germinated in only two of the tubes.

Table 3.1 shows the conditions for each tube.

Table 3.1

conditions	tube A	tube B	tube C	tube D	tube E
oxygen	present	present	absent	present	present
water	absent	absent	present	present	present
light	absent	present	present	present	absent

(i) Predict in which tubes the seeds would germinate.

Explain your answer.

tube ..... and tube .....

explanation .....

.....

.....

[3]

(ii) State **one** condition **not** shown in Table 3.1 that is required for germination.

..... [1]

View solution

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(b) Figure 3.1 is a photograph of the flowers of a wind-pollinated plant.

View solution

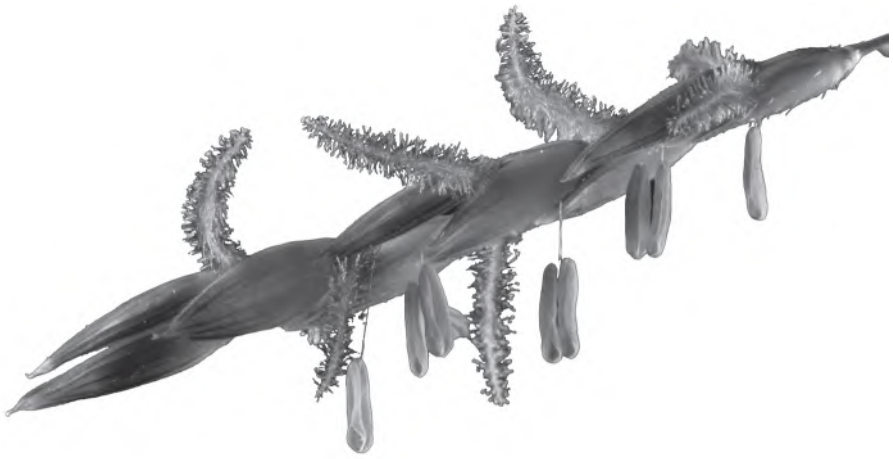

Figure 3.1

(i) Circle a part where pollen is produced on Figure 3.1. [1]

(ii) On Figure 3.1, label a part that receives pollen during pollination with an **X** and a label line. [1]

(iii) Describe how an insect-pollinated flower would differ from the flowers shown in Figure 3.1.

.....

.....

.....

.....

.....

.....

..... [3]

(c) State the names of the **two** parts of a stamen.

View solution

1 .....

2 .....

[2]

(d) State where fertilisation occurs in a plant.

View solution

..... [1]

[Total: 12]

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4 Albinism is an inherited condition that prevents pigment being made in the skin. This results in a person having very pale skin.

Albinism is controlled by a single gene.

The allele for albinism is recessive and is represented by the letter **a**.

The allele for no albinism is dominant and is represented by the letter **A**.

View solution

(a) The list shows some words or phrases that can be used to describe the inheritance of albinism.

Complete Table 4.1 using words or phrases from the list.

Each word or phrase may be used once, more than once or not at all.

dominant allele **heterozygous** **homozygous**

phenotype **recessive allele**

Table 4.1

example	term
Aa	
AA	
pale skin with no pigment	

[3]

View solution

(b) Complete Table 4.2 by writing **yes** or **no** in each row to show if each pair of alleles results in albinism.

Table 4.2

pair of alleles	person has albinism (yes or no)
AA	
Aa	
aa	

[2]

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(c) People with the alleles **AA** and **Aa** have a baby.

Complete the genetic diagram in Figure 4.1 to show the percentage chance of having a baby with the alleles **Aa**.

View solution

	A	**A**
A	.....	.....
a	.....	.....

percentage chance of having a baby with the alleles **Aa** ..... %

Figure 4.1

[2]

View solution

(d) Chromosomes contain genes.

(i) State where chromosomes are found in human cells.

..... [1]

(ii) State the **two** sex chromosomes in humans.

..... and ..... [1]

[Total: 9]

View solution

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5 **(a)** A student investigated the effect of temperature on the movement of dye in two beakers of water.

View solution

Beaker **A** contained cold water.

Beaker **B** contained hot water.

A drop of dye was added to each beaker and left for five minutes.

Figure 5.1 shows the beakers after five minutes.



beaker **A** beaker **B**

Figure 5.1

Explain the difference in appearance between beakers **A** and **B** in Figure 5.1.

Use the word particles in your explanation.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

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(b) Some substances are transported across cell membranes against a concentration gradient.

(i) State the name of this type of transport.

View solution

..... [1]

(ii) State the name of the process that releases energy for this type of transport.

View solution

..... [1]

(iii) State the name of the cell structure where the process named in **5(b)(ii)** occurs.

..... [1]

[Total: 7]

View solution

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6 **(a)** Figure 6.1 shows the effect of adrenaline on an eye.

View solution

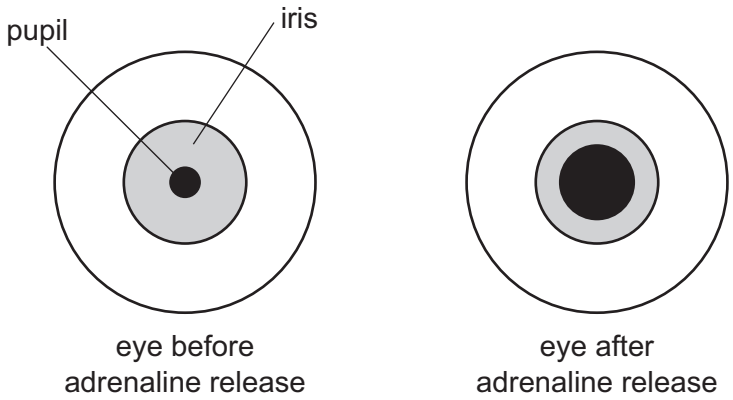

Figure 6.1

(i) Describe the effect of adrenaline on the eye.

.....

.....

..... [1]

(ii) State **one other** stimulus that would cause the same effect as the one shown in Figure 6.1.

View solution

..... [1]

(iii) State **two other** effects of adrenaline on the body.

View solution

1 .....

2 .....

[2]

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(b) Adrenaline is released by a gland.

View solution

Figure 6.2 show some parts of the male human body.

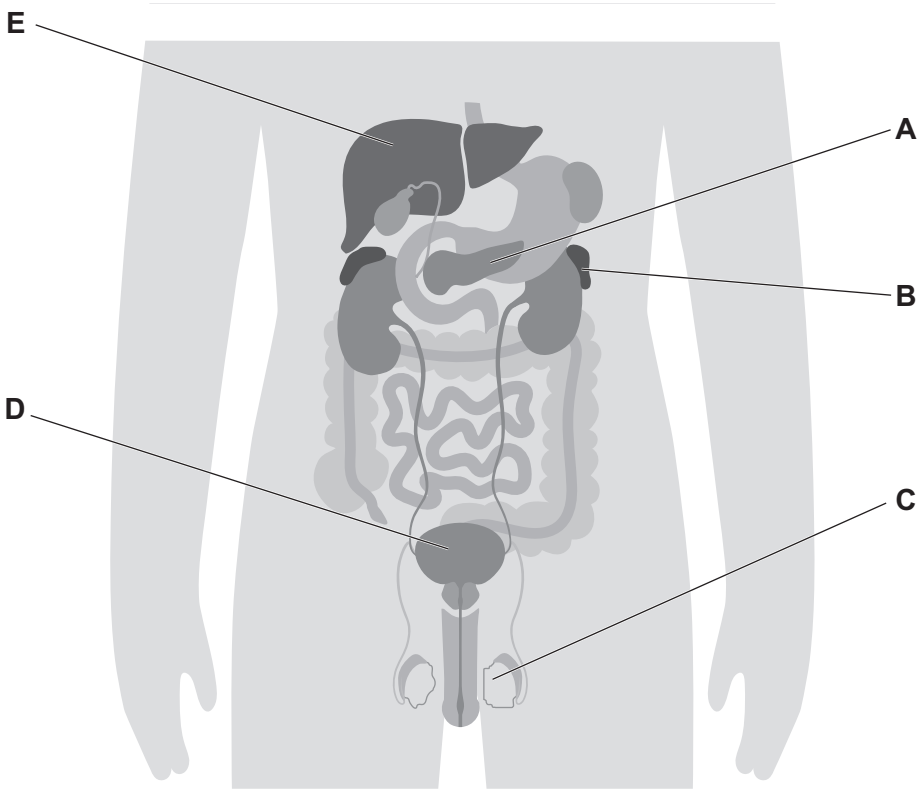

Figure 6.2

(i) State the letter in Figure 6.2 that identifies the gland that releases the hormone:

adrenaline .....

insulin .....

testosterone .....

[3]

(ii) State the type of gland that releases hormones.

..... [1]

View solution

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(c) The box on the left contains the word ‘Hormones’.


View solution

The boxes on the right contain some sentence endings.

Draw lines to make **three** correct sentences about hormones.

	are chemical substances.
	are responsible for reflex actions.
Hormones	are transported through neurones.
	have effects that last longer than nervous control.
	have specific target organs.

[3]

[Total: 11]

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Turn over

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7 **(a)** Some people with diabetes are unable to produce their own insulin.

State the function of insulin.

View solution

..... [1]

(b) Genes can be inserted into bacteria to produce human proteins, such as insulin.

View solution

(i) State the name given to the process of changing the genes of an organism.

..... [1]

(ii) State **two** reasons why bacteria are useful for this process.

View solution

1 .....

.....

2 .....

.....

[2]

(iii) State **two** structures found in bacterial cells that are absent in human cells.

View solution

1 .....

2 .....

[2]

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(c) Some bacteria were grown in a flask and the population size was measured over time.

View solution

Figure 7.1 is a graph of the results.

The letters represent different phases of bacterial population growth.

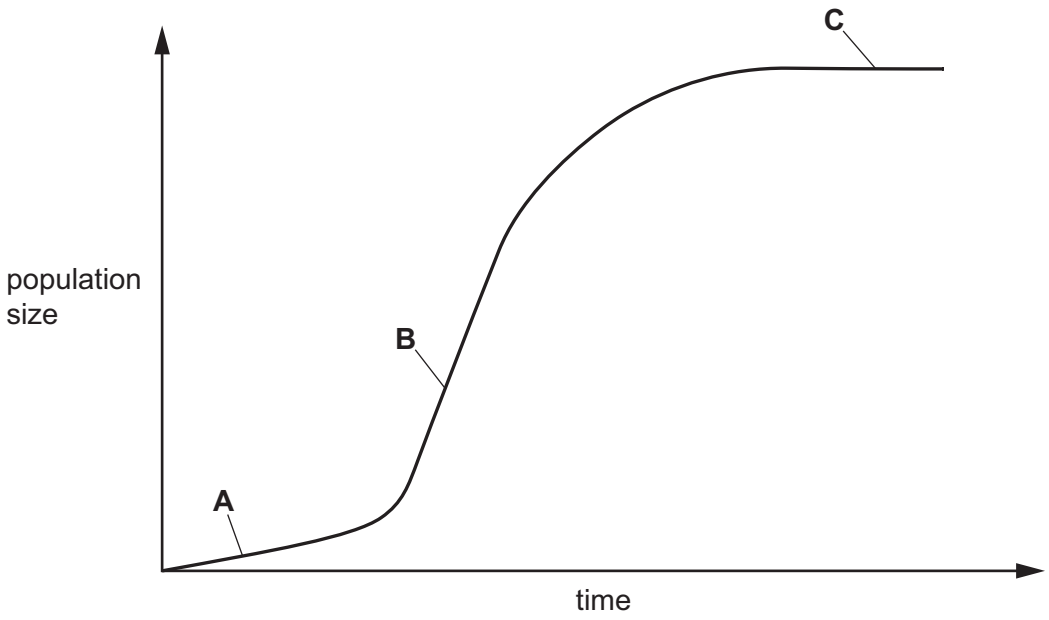

Figure 7.1

(i) State **three** conditions that affect the steepness of the slope in phase **B** in Figure 7.1.

1 .....

2 .....

3 .....

[3]

(ii) State the names of phases **A** and **C** in Figure 7.1.

View solution

A .....

C .....

[2]

[Total: 11]

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8 Figure 8.1 is a photograph of an Arabian oryx.

They became extinct in the wild in 1972.



Figure 8.1

(a) Describe reasons why animals such as the Arabian oryx become extinct in the wild.

View solution

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

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(b) Some Arabian oryxes were still alive in zoos in 1972.

View solution

They were successfully reintroduced back into the wild in 1978.

Table 8.1 shows the changes to the Arabian oryx population in one area after their reintroduction into the wild.

Table 8.1

year	population size / number of individuals
1980	20
1985	45
1990	65
1995	160
2000	250

(i) State the name of the process that zoos use to increase the number of individuals of an endangered species.

..... [1]

(ii) Calculate the percentage increase in the population size of Arabian oryx between **1980** and **2000** in Table 8.1.

View solution

.....% [2]

(c) Arabian oryx is a species that reproduces sexually.

View solution

Tick (✓) boxes to show **two** correct statements about Arabian oryxes.

They can produce fertile offspring.	
They can produce offspring that are genetically identical to the parent.	
Only one parent is needed for reproduction.	
They respire.	
They are producers.	

[2]

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(d) In the wild, Arabian oryx all live in similar ecosystems.

View solution

Describe what is meant by an ecosystem.

.....

.....

.....

.....

..... [2]

[Total: 11]

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