Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

4902502399

BIOLOGY **0610/33**

Paper 3 Theory (Core) **October/November 2020**

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 or correction fluid.
- 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 **20** pages. Blank pages are indicated.

DC (TC/CB) 191312/4

[Turn over

1 **(a)** Fig. 1.1 is a photograph of a strawberry plant growing in a glasshouse. It photosynthesises and produces fruit.

Fig. 1.1

(i) State the names of the products of photosynthesis.

..... [1]

(ii) State the name of the structure in plant cells which contains chlorophyll.

..... [1]

(b) Scientists investigated the effect of carbon dioxide concentration on the rate of photosynthesis of strawberry plants grown in a glasshouse.

Fig. 1.2 is a graph of the results of the investigation.

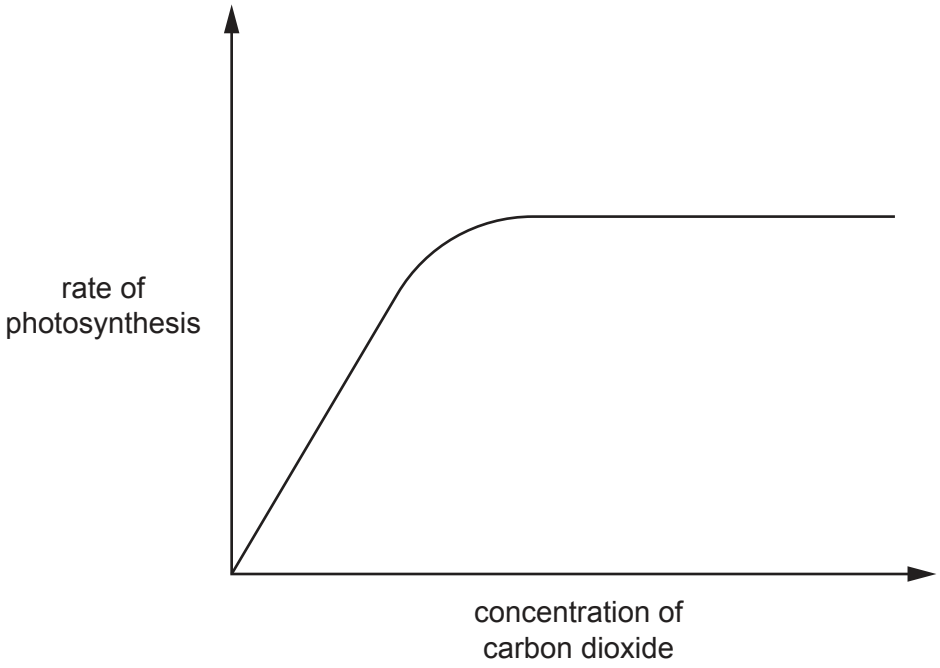

Fig. 1.2

(i) Describe the trend shown in the graph in Fig. 1.2.

.....

.....

..... [1]

(ii) The investigation on the effect of carbon dioxide concentration on the rate of photosynthesis was repeated at a higher light intensity.

Sketch, **on the graph in Fig. 1.2**, a second line to show the expected results of this second investigation. [2]

(iii) Place ticks (✓) in the correct boxes to identify **three** substances or conditions that would be supplied to the strawberry plants to maximise photosynthesis.

glucose	
lipase	
magnesium ions	
warm temperature	
water	
very low light intensity	

[3]

(c) Plants are an important part of the water cycle.

Fig. 1.3 is a diagram of the water cycle.

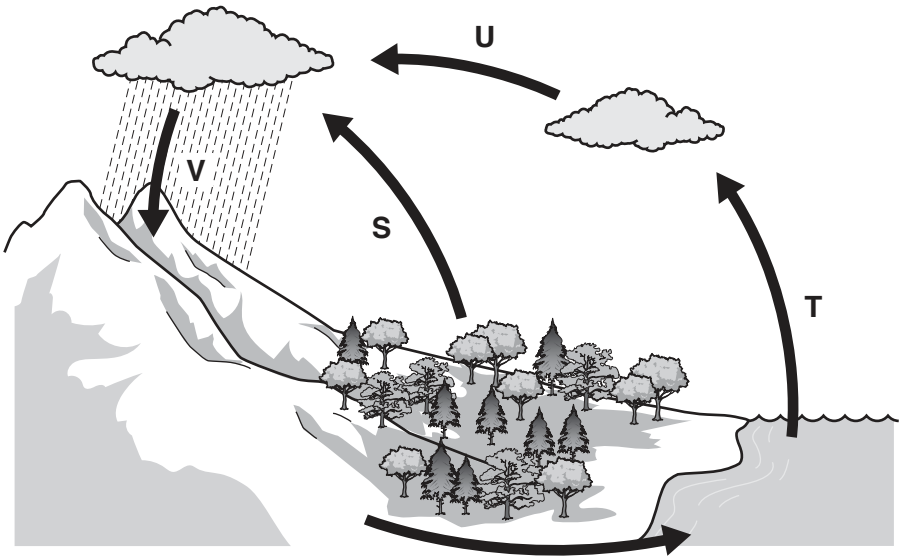

Fig. 1.3

Table 1.1 shows the letters from Fig. 1.3, and descriptions of the stages in the water cycle.

Complete Table 1.1 by writing the name of each stage in the correct boxes.

Table 1.1

letter from Fig. 1.3	name of stage	description of stage
S		loss of water vapour from plant leaves
T		heat from the Sun causes liquid water to change into water vapour
U		water vapour in the air changes to liquid water in the clouds
V		the liquid water falls to the ground

[4]

[Total: 12]

2 **(a)** Fig. 2.1 is a diagram of the human male reproductive system.

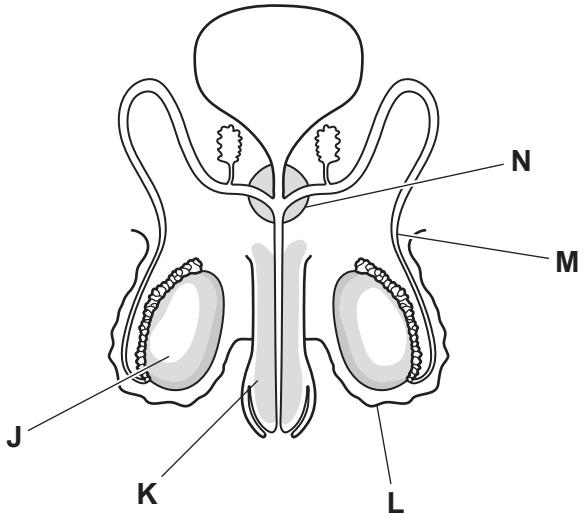

Fig. 2.1

The boxes on the left show the letters from Fig. 2.1.

The boxes in the middle show the names of the parts shown in Fig. 2.1.

The boxes on the right show the function of each part.

Draw **one** line to link each letter from Fig. 2.1 to its correct name.

Draw **one** line to link each name to its correct function.

Draw a total of **ten** lines.

letter from Fig. 2.1	**name**	**function**
J	penis	carries sperm cells away from the testis
K	prostate gland	delivers sperm into the vagina
L	scrotum	holds the testes and keeps them cool
M	sperm duct	makes the fluid that sperm cells swim in
N	testis	where sperm are made

[5]

(b) State **two** barrier methods of birth control.

1 .....

2 .....
[2]

[Total: 7]

3 **(a)** Fig. 3.1 is a photograph of a butterfly.

Butterflies are arthropods.

Fig. 3.1

State the group of arthropods that the butterfly belongs to and describe **one** feature visible in Fig. 3.1 that is characteristic of this group.

group .....

feature .....
[2]

(b) Many butterfly species are endangered.

Fig. 3.2 shows the size of the area in which five species of butterfly were found in 1992 and 2017.

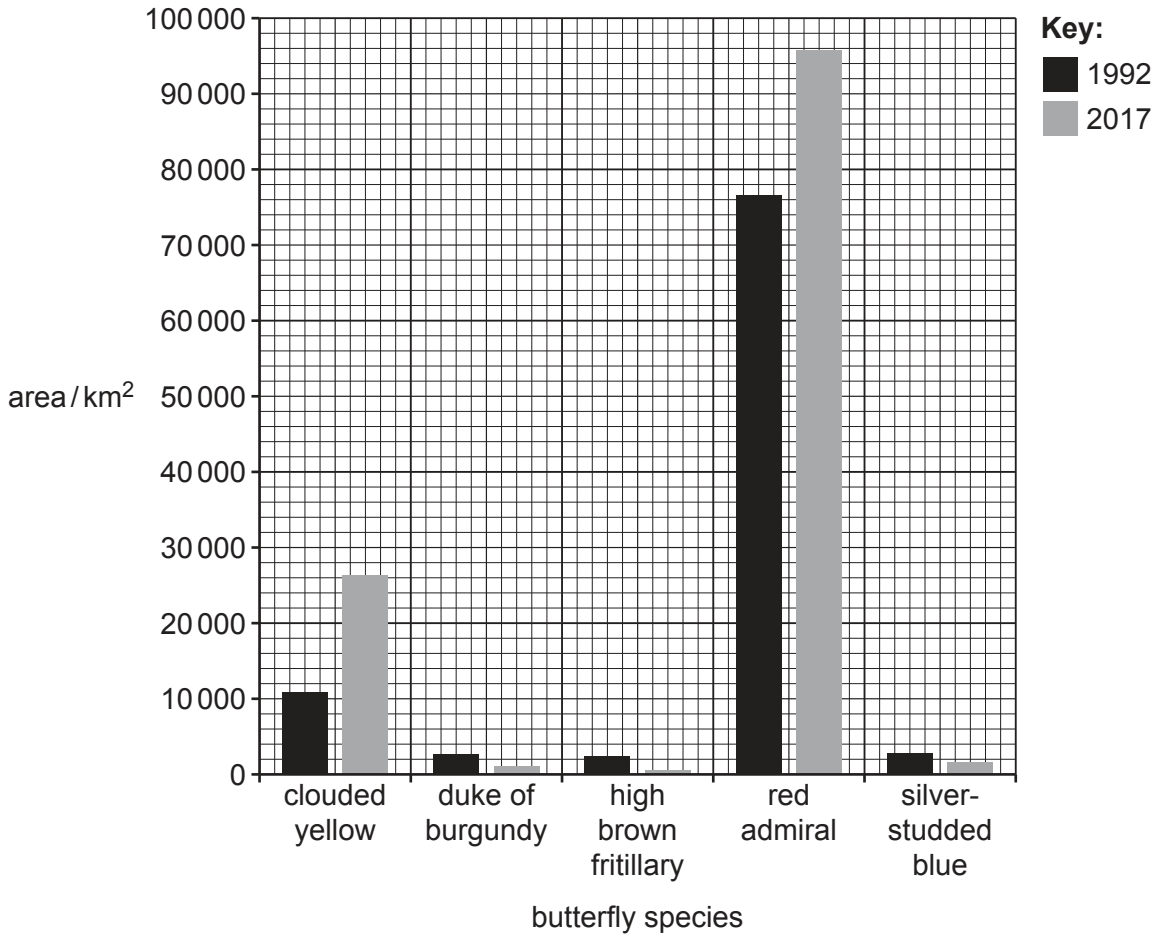

Fig. 3.2

(i) State the name of **one** species that was found in a larger area in 2017 than in 1992.

..... [1]

(ii) Use the information in Fig. 3.2 to suggest the name of the butterfly species that is the most endangered.

Give a reason for your choice.

name .....

reason .....

.....

[2]

(iii) Describe how endangered species such as butterflies can be conserved.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

[Total: 9]

4 **(a)** Define the term homeostasis.

.....

.....

.....

.....

..... [2]

(b) The skin is an important organ involved in temperature regulation in mammals.

Fig. 4.1 is a diagram of a cross-section of mammalian skin.

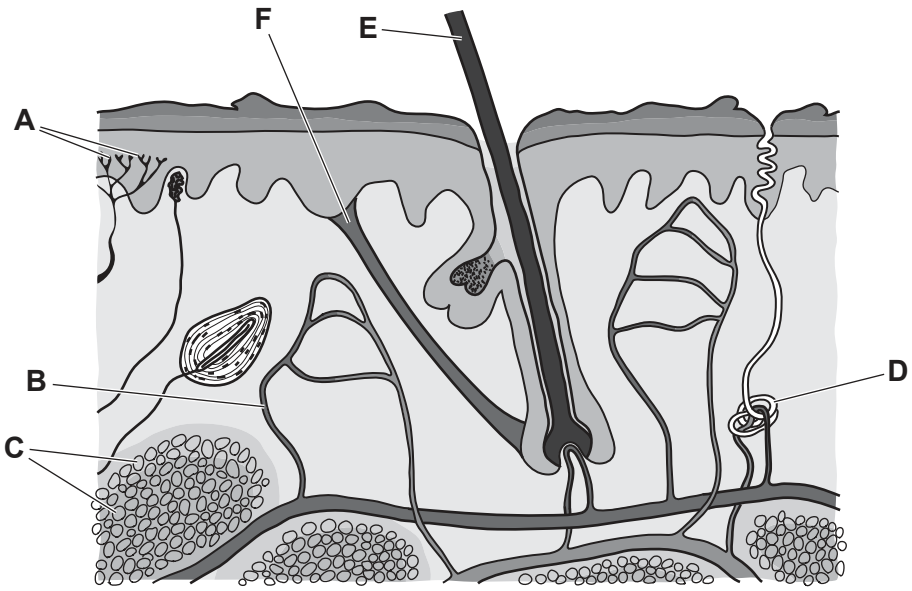

Fig. 4.1

(i) State the names of structures **A**, **B**, **C** and **D** on Fig. 4.1.

A .....

B .....

C .....

D .....

[4]

(ii) Describe how the structures labelled **C**, **E** and **F** in Fig. 4.1 reduce heat loss in **cold** conditions.

.....

.....

.....

.....

.....

.....

..... [3]

(iii) Complete the sentences about maintenance of body temperature using the words and phrases from the list.

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

blood **brain** **condenses** **evaporates**

neurones **receptors** **skin**

sweat **temperature** **water content**

Control of body temperature is coordinated by the ..... .

There are temperature ..... that sense the temperature of the

..... .

When the temperature gets too hot, glands release ..... onto

the surface of the skin and the water in it ..... reducing body

temperature.

[5]

[Total: 14]

5 **(a)** **(i)** Table 5.1 shows some statements about arteries, capillaries and veins.

Place ticks (✓) in the boxes to show which statements are correct for arteries, capillaries and veins.

One has been done for you.

Table 5.1

statements	arteries	capillaries	veins
carry blood away from the heart	✓		
supply cells with nutrients and remove waste products			
return blood to the heart			
have a thick wall containing muscle and elastic tissue			
have a thin wall containing muscle and elastic tissue			
have a very thin wall with no muscle or elastic tissue			

[5]

(ii) State **one** other way in which the structure of a vein is different from an artery.

..... [1]

(b) Oxygen moves from the blood into body cells.

Carbon dioxide moves from body cells into the blood.

(i) State the name of the process in a cell that uses oxygen and releases carbon dioxide.

..... [1]

Fig. 5.1 is a drawing representing the movement of molecules into and out of an animal cell.

The number of dots represent the concentrations of molecules inside and outside the cell.

The arrows show the direction of movement of the molecules.

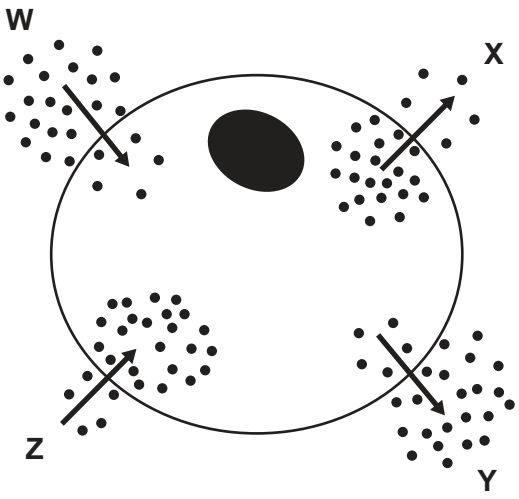

Fig. 5.1

(ii) State the letter(s) that represent the movement of:

molecules by active transport .....

molecules by diffusion .....

[2]

[Total: 9]

6 (a) (i) The box on the left shows the beginning of a sentence.

The boxes on the right show some sentence endings.

Draw **two** straight lines from 'Excretion' to the boxes on the right to make **two** correct sentences.

	is the movement of digested food molecules into cells.
	is the passing out of undigested food from an organism.
Excretion	is the removal of excess substances from an organism.
	is the removal of toxic materials from an organism.
	is the taking in of materials for energy and growth.

[2]

(ii) The kidney filters the blood and produces a liquid called urine.

State **three** substances that are found in the urine of a healthy person.

1 .....

2 .....

3 .....

[3]

(b) Fig. 6.1 is a diagram of part of the human excretory system and associated blood vessels.

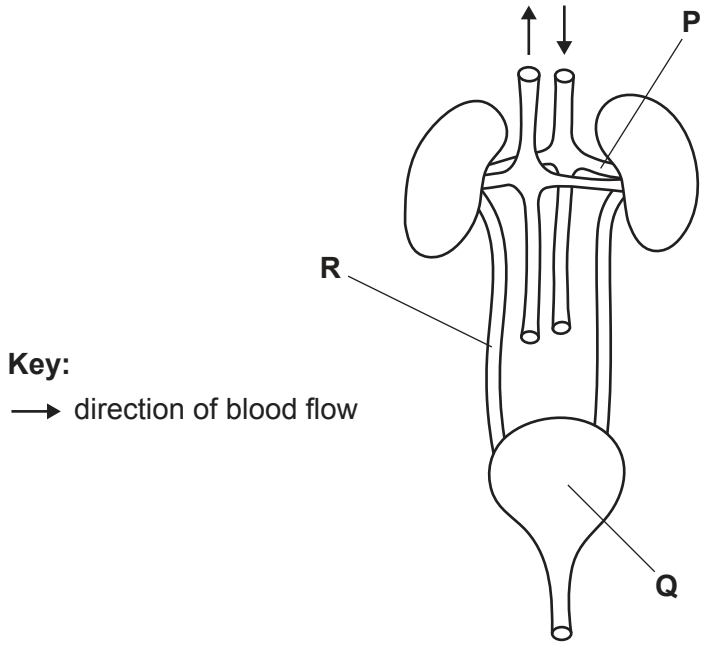

Fig. 6.1

State the names of parts **P**, **Q** and **R** in Fig. 6.1.

P .....

Q .....

R .....

[3]

(c) The volume and concentration of urine produced is affected by changes in water consumption, temperature and exercise levels.

Table 6.1 shows three different conditions.

Complete Table 6.1 by writing **increases** or **decreases** in the boxes to show the effect of each condition on the volume and concentration of urine produced.

Table 6.1

condition	volume of urine	concentration of urine
increase in water consumption		
increase in temperature		
increase in exercise level		

[3]

(d) Protein can be broken down into amino acids.

(i) List **four** chemical elements that are always found in protein.

1 .....

2 .....

3 .....

4 .....

[2]

(ii) State the name of the organ in the human body that breaks down excess amino acids.

..... [1]

(e) Fig. 6.2 shows some chemical reactions that are catalysed by enzymes.

The enzyme catalysing the reaction is shown on the arrow.

Complete Fig. 6.2 by filling in the names of the **four** missing molecules.

starch $\xrightarrow{\text{amylase}}$ .....

.....

protein $\longrightarrow$ amino acids

fats $\xrightarrow{\text{lipase}}$ ..... and .....

Fig. 6.2

[3]

[Total: 17]

7 Tobacco smoke damages health and can cause many different diseases.

(a) Table 7.1 shows the number of deaths, caused by smoking, for three different diseases.

Table 7.1

disease	number of deaths caused by smoking
chronic obstructive pulmonary disease (COPD)	13 200
coronary heart disease (CHD)	12 000
lung cancer	22 800

Calculate the percentage of deaths that were caused by COPD.

Space for working.

.....%
[2]

(b) Fig. 7.1 is a drawing of a cigarette showing some of the substances in tobacco smoke.

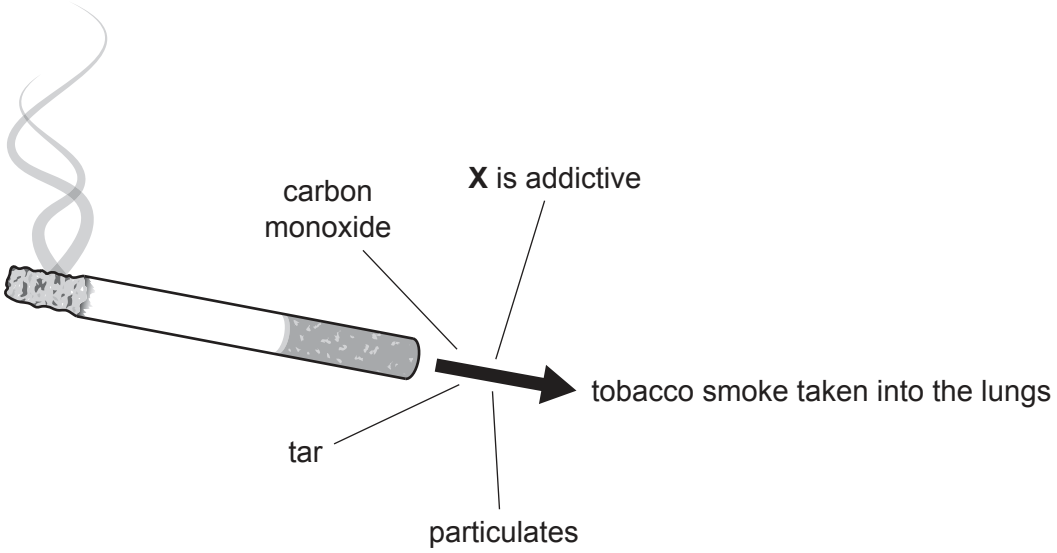

Fig. 7.1

(i) Describe the effect of carbon monoxide and tar on the gas exchange system.

carbon monoxide .....

.....

.....

tar .....

.....

.....

[4]

(ii) State the name of component **X** shown in Fig. 7.1.

..... [1]

(c) Pregnant women are advised not to smoke as the harmful substances in tobacco can be transferred from the woman to her fetus.

Describe how the harmful substances are transferred from the mother to the fetus.

.....

.....

.....

.....

..... [2]

(d) Smoking is a risk factor for coronary heart disease.

State **three other** risk factors for coronary heart disease.

1 .....

2 .....

3 .....

[3]

[Total: 12]

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