Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

8161503833

BIOLOGY **0610/33**

Paper 3 Theory (Core) **May/June 2023**

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. Any blank pages are indicated.

© UCLES 2023

1 **(a)** Fig. 1.1 is a photograph of an insect. Insects are arthropods.



Fig. 1.1

(i) Arthropods belong to the animal kingdom.

State the name of **one other** kingdom.

..... [1]

(ii) State **one** feature **visible** in Fig. 1.1 that is present in insects but **not** in the other groups of arthropods.

..... [1]

(iii) Complete Table 1.1 by writing:

- the names of **two** groups of arthropods **other than** insects
- **one** identifying feature for each named group.

Table 1.1

arthropod group	name of the arthropod group	identifying feature
1		
2		

[4]

(b) **(i)** Complete the description of an adaptive feature.

An adaptive feature is an ..... feature that helps an organism to survive and ..... in its environment.

[2]

© UCLES 2023

(ii) Fig. 1.2 is a photograph of a leaf insect.



Fig. 1.2

State **one** adaptive feature **visible** in Fig. 1.2 and suggest how the adaptive feature helps the animal to survive.

feature .....

.....

suggestion .....

.....

.....

[2]

[Total: 10]

2 **(a)** Fig. 2.1 is a labelled diagram of an animal cell.

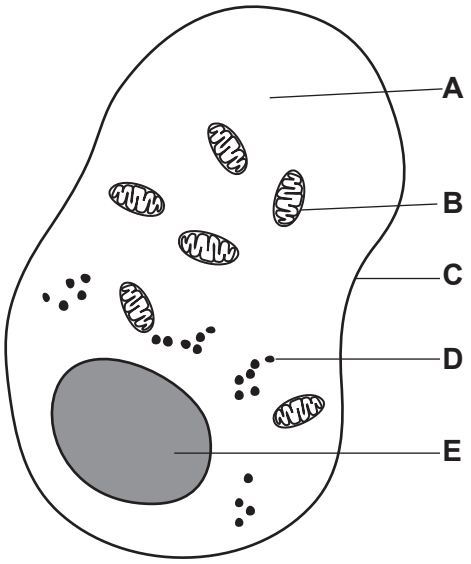


Fig. 2.1

(i) The boxes on the left show the functions of some of the structures shown in Fig. 2.1.

The boxes on the right show the letters of the structures labelled in Fig. 2.1.

Draw lines to link each function to the correct letter.

Draw **four** lines.

functions	**letter in Fig. 2.1**
contains and supports other cell structures	**A**
controls the activities of the cell	**B**
controls which substances enter or leave the cell	**C**
protein synthesis	**D**
	E

[4]

(ii) State **two** letters shown in Fig. 2.1 that identify structures which are also found in bacterial cells.

..... and .....

[2]

(b) Respiration is a characteristic of living organisms.

State **three other** characteristics of all living organisms.

1 .....

2 .....

3 .....

[3]

[Total: 9]

BLANK PAGE

3 **(a)** State the meaning of the term chemical digestion.

.....

.....

.....

.....

..... [2]

(b) Enzymes are involved in chemical digestion.

Table 3.1 shows some information about enzymes used for chemical digestion.

(i) Complete Table 3.1.

Table 3.1

enzyme	substrate	products
amylase		simple reducing sugars
lipase	fats and oils	
protease	proteins	

[4]

(ii) State where amylase, lipase and protease are made in the human body.

amylase .....

lipase .....

protease .....

[3]

(c) **(i)** State the name of the acid found in gastric juice.

..... [1]

(ii) State **two** functions of the acid found in gastric juice.

1 .....

2 .....

[2]

[Total: 12]

4 **(a)** Complete the sentences about the circulatory system.

The heart ..... blood around the body.

Blood is carried away from the heart in blood vessels called ..... .

Blood is carried to the heart in blood vessels called ..... .

Nutrients are delivered to cells by blood vessels called ..... .

One-way flow of blood is ensured by the presence of ..... .

[5]

(b) Fig. 4.1 shows ECG traces of the activity of a student's heart.

An ECG trace was produced while the student was at rest and while the student was exercising.

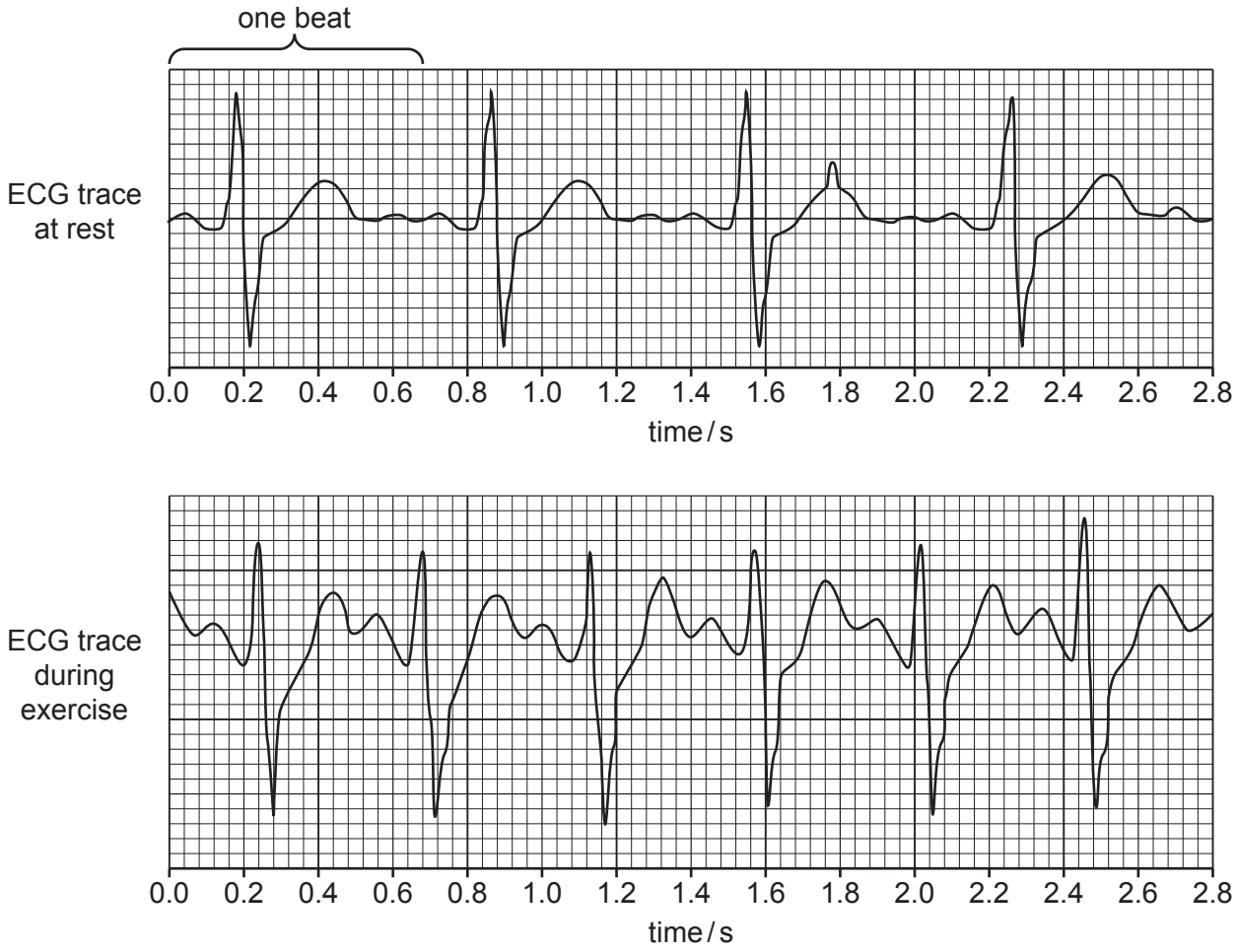


Fig. 4.1

The ECG trace shows the number of heart beats in 2.8 seconds.

There were four heart beats in 2.8 seconds at rest.

© UCLES 2023

(i) State the number of heart beats in 2.8 seconds during exercise.

..... [1]

(ii) Calculate the percentage **increase** in heart beats between at rest and during exercise.

Space for working.

.....% [1]

(c) Regular exercise reduces the risk of developing coronary heart disease (CHD).

Describe other ways of reducing a person's risk of developing coronary heart disease.

.....

.....

.....

.....

.....

.....

..... [3]

(d) Fig. 4.2 shows a stethoscope which is used to listen to the heart.



Fig. 4.2

State the cause of the heart sounds detected by the stethoscope.

.....

.....

..... [1]

[Total: 11]

© UCLES 2023

BLANK PAGE

5 **(a)** Fig. 5.1 is a diagram of a cell carrying out one type of respiration.

The arrows show the direction of movement of the substances involved in respiration in this type of cell.

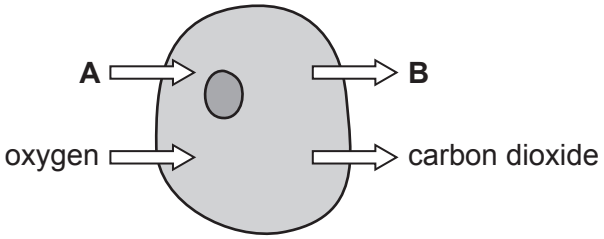


Fig. 5.1

(i) State the type of respiration shown by Fig. 5.1.

..... [1]

(ii) Identify the substances involved in respiration that are represented by the letters **A** and **B** in Fig. 5.1.

A .....

B .....
[2]

(iii) State the process by which oxygen moves into the cell.

..... [1]

(b) State **three** processes that require energy from respiration.

1 .....

2 .....

3 .....
[3]

© UCLES 2023

(c) Some students investigated the effect of temperature on respiration in yeast.

- The students put a beaker containing 20 cm^3 of a yeast suspension into a water-bath at different temperatures.
- They collected the gas released by the yeast cells in a gas syringe.
- They recorded the volume of gas released after 15 minutes.

Table 5.1 shows the results.

Table 5.1

temperature / °C	volume of gas collected in 15 minutes / cm^3
0	0.5
10	2.8
20	5.6
30	9.2
40	18.2
50	16.3
60	10.4
70	0.3
80	0.1
90	0.1

Using the data in Table 5.1, describe the effect of temperature on the rate of respiration in yeast.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 10]

6 A seedling is a seed which has just started to grow a small root and a small shoot.

(a) State the environmental conditions that a seed requires to grow into a seedling.

.....

.....

.....

..... [3]

(b) Fig. 6.1 shows a drawing of a seedling at the start of an investigation into plant growth responses.

The seedling was attached to a piece of card so that the root and shoot were horizontal.

The card and seedling were placed inside a box that excluded all light. The box was placed on the ground for three days.

Fig. 6.1 shows the apparatus at the start of the investigation.

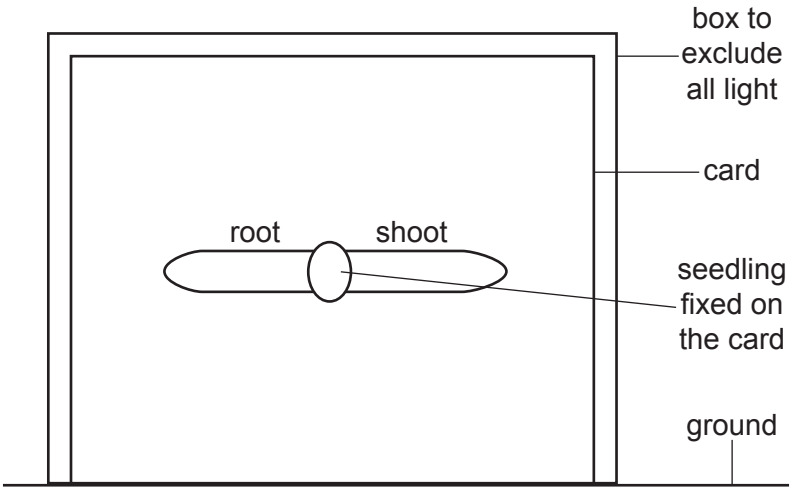


Fig. 6.1

(i) On Fig. 6.2 draw the expected appearance of the root and shoot after three days in the box.

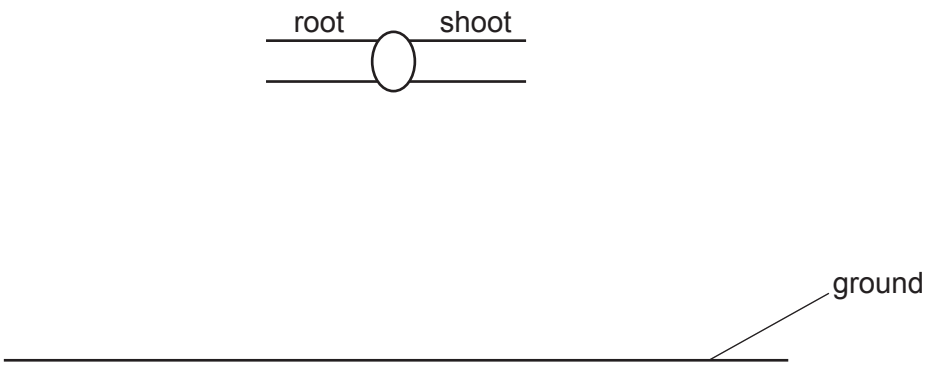


Fig. 6.2

[2]

(ii) State the name of the response shown by the root and the shoot in this investigation.

..... [1]

[Total: 6]

7 **(a)** Fig. 7.1 is a diagram of part of the male reproductive system.

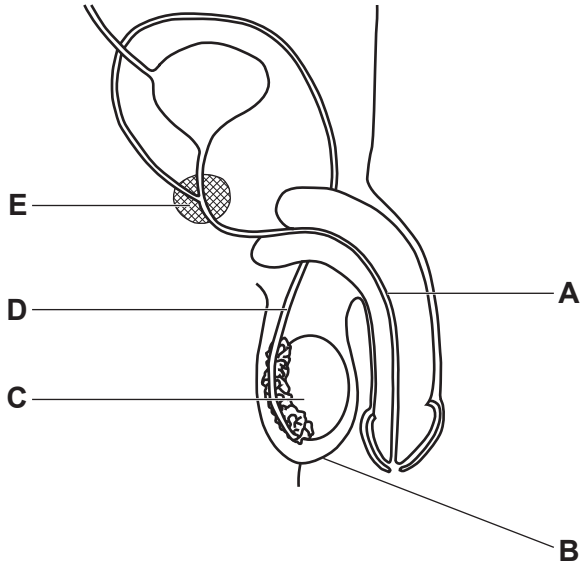


Fig. 7.1

Complete Table 7.1 by writing in the letter of the structure identified in Fig. 7.1 that carries out each function.

Each letter can be used once, more than once or not at all.

Table 7.1

function	letter on Fig. 7.1
carries sperm only	
contains the testes and keeps them cool	
makes the fluid that sperm cells swim in	
produces testosterone	
where sperm are made	

[5]

(b) State the name of the hormone that controls development of secondary sexual characteristics in females.

..... [1]

© UCLES 2023

(c) Fig. 7.2 shows drawings of stages in human sexual reproduction.

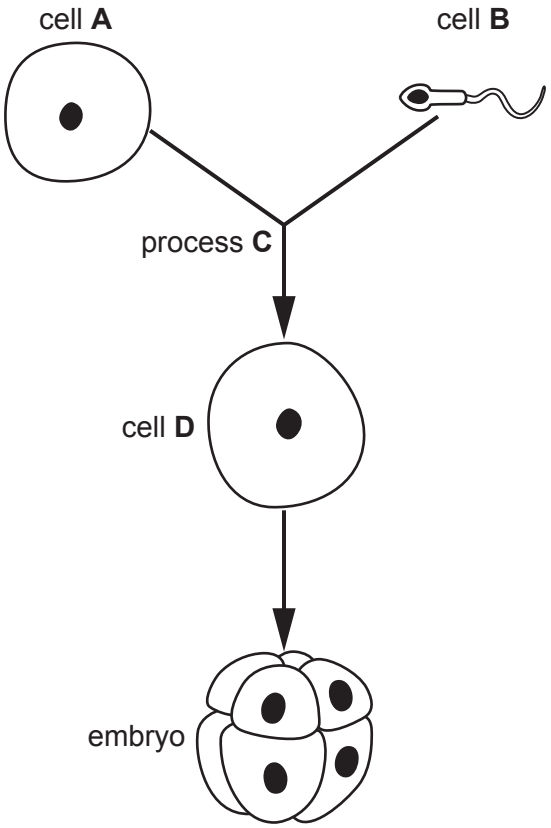


Fig. 7.2

Identify the cells and the process labelled in Fig. 7.2.

cell **A** .....

cell **B** .....

process **C** .....

cell **D** .....

[4]

[Total: 10]

8 **(a)** State **one** source of methane gas.

..... [1]

(b) Fig. 8.1 is a graph showing the estimated change in methane concentration in the atmosphere over a thousand-year period.

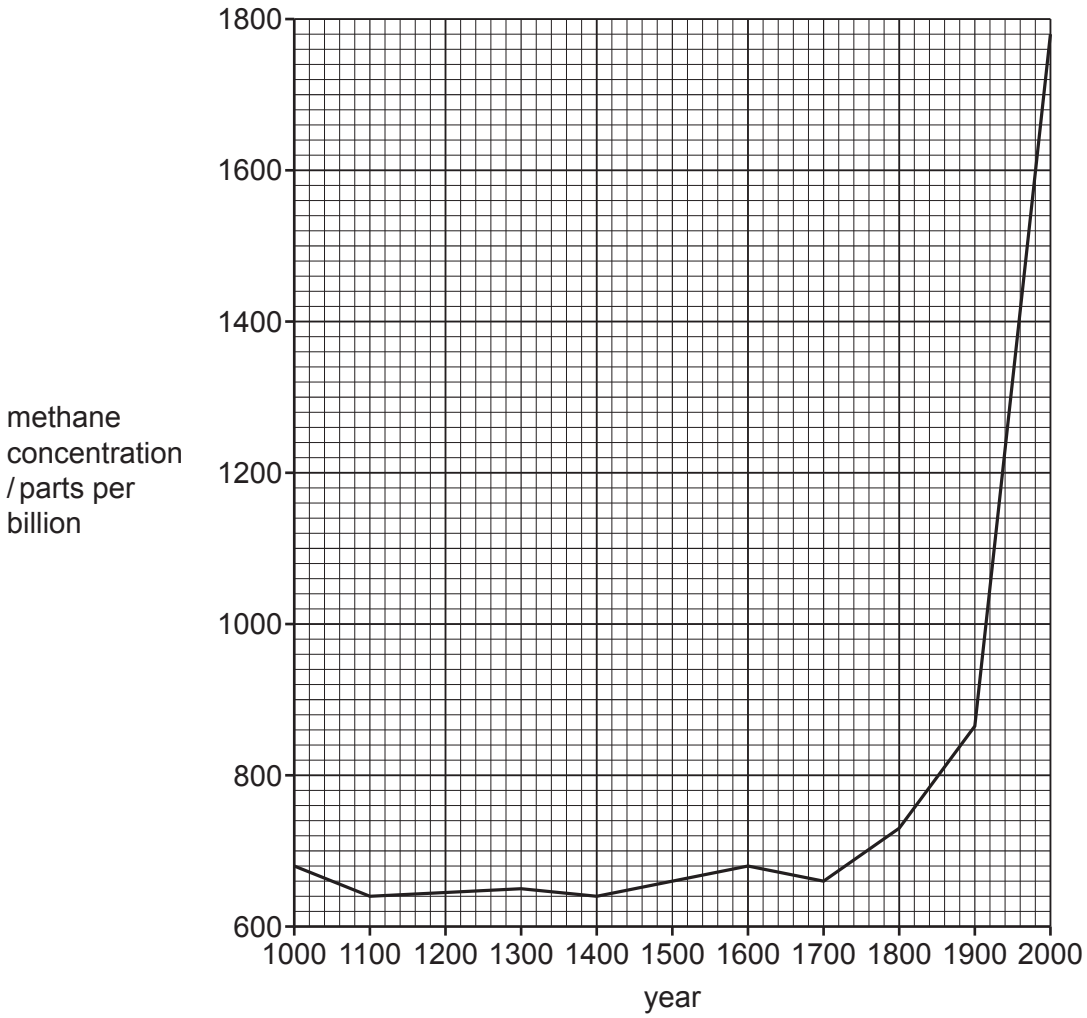


Fig. 8.1

Complete the sentences to describe the changes in methane concentration shown in Fig. 8.1.

The general trend is for methane concentration to ..... .

The concentration of methane was the same in the year 1000 and in the year ..... .

Over the thousand-year period shown in the graph, the concentration of methane has increased by ..... parts per billion.

[3]

(c) (i) State **one** process, other than respiration, that releases carbon dioxide into the atmosphere.

..... [1]

(ii) State **two** effects on the environment of increasing carbon dioxide and methane concentrations in the atmosphere.

1 .....

2 .....
[2]

(iii) State **one** natural process that removes carbon dioxide from the atmosphere.

..... [1]

(d) Yeast can be used to produce ethanol for use as a biofuel.

(i) State the name of the process used by yeast to produce ethanol.

..... [1]

(ii) Large amounts of ethanol are required as a biofuel.

Maize is a food plant that is also used to produce ethanol as a biofuel.

Maize grown for ethanol production is grown in large-scale monocultures.

Describe the **disadvantages** of growing crop plants such as maize in a large-scale monoculture.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 12]

© UCLES 2023

BLANK PAGE

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cambridgeinternational.org after the live examination series.

Cambridge Assessment International Education is part of Cambridge Assessment. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which is a department of the University of Cambridge.

© UCLES 2023