Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

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.

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

View solution



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.

View solution

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

[2]

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

View solution



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.

View solution

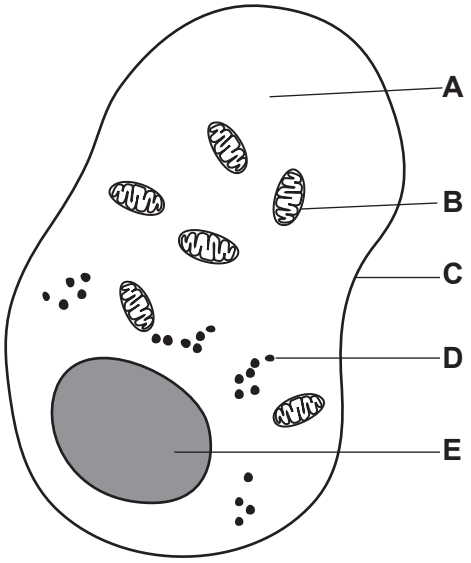

Fig. 2.1

(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.

View solution

..... and .....

[2]

(b) Respiration is a characteristic of living organisms.

View solution

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

1 .....

2 .....

3 .....

[3]

[Total: 9]

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

View solution

.....

.....

.....

.....

..... [2]

(b) Enzymes are involved in chemical digestion.

View solution

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.

View solution

amylase .....

lipase .....

protease .....

[3]

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

View solution

..... [1]

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

View solution

1 .....

2 .....

[2]

[Total: 12]

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

View solution

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.

View solution

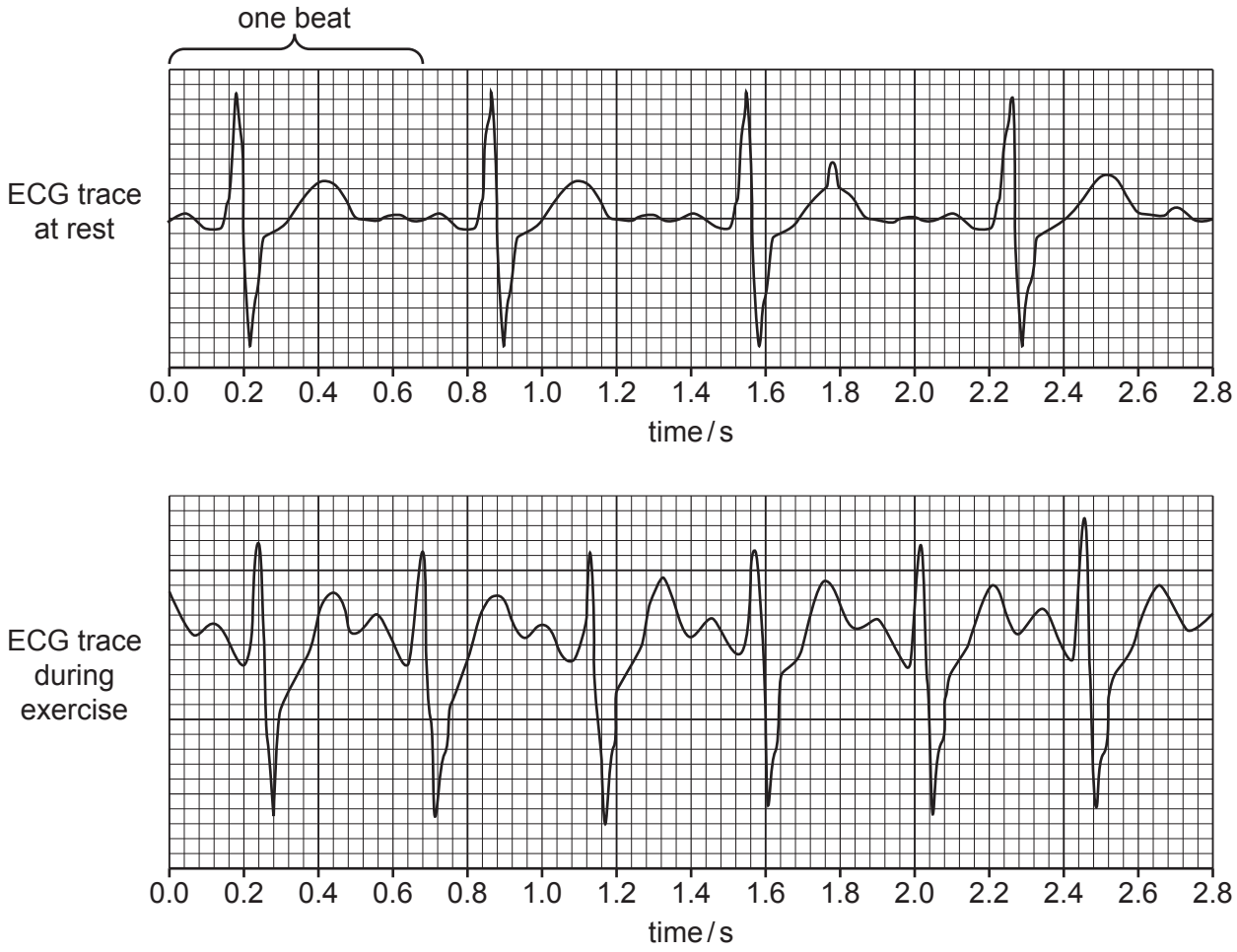

Fig. 4.1

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

There were four heart beats in 2.8 seconds at rest.

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(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.

View solution

.....% [1]

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

View solution

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.

View solution



Fig. 4.2

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

.....

.....

..... [1]

[Total: 11]

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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.

View solution

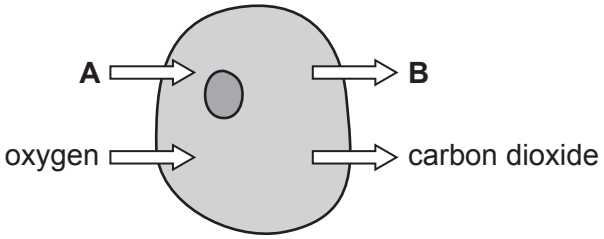

Fig. 5.1

(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.

View solution

1 .....

2 .....

3 .....

[3]

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(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.

View solution

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]

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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.

View solution

.....

.....

.....

..... [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.

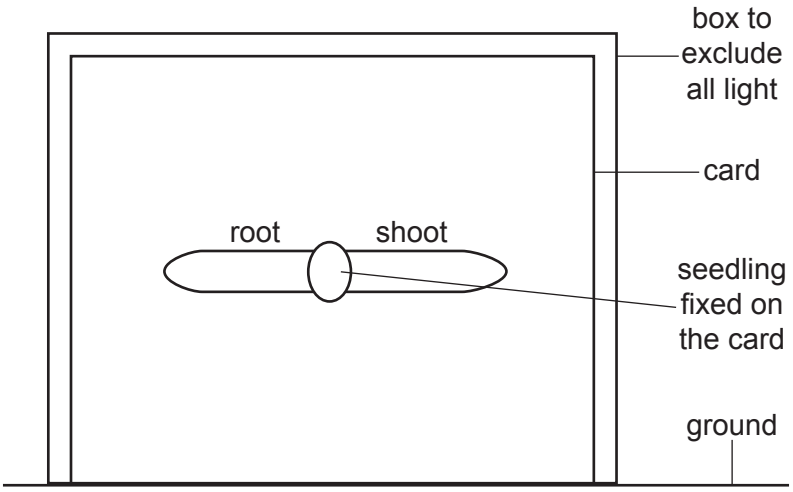

Fig. 6.1

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

View solution

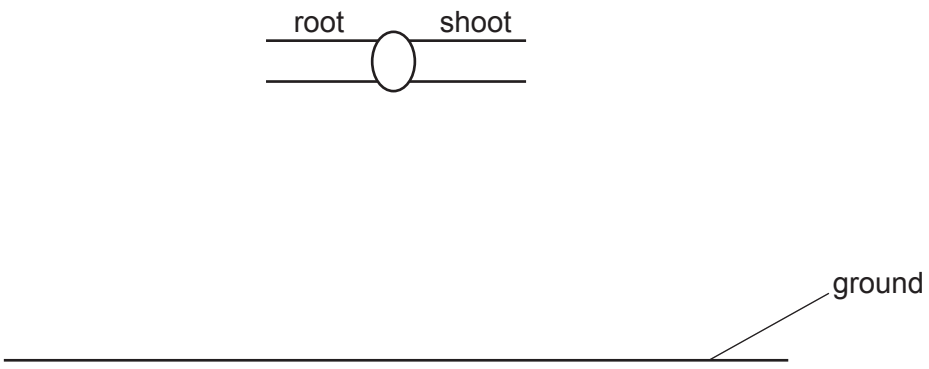

Fig. 6.2

[2]

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

..... [1]

[Total: 6]

View solution

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

View solution

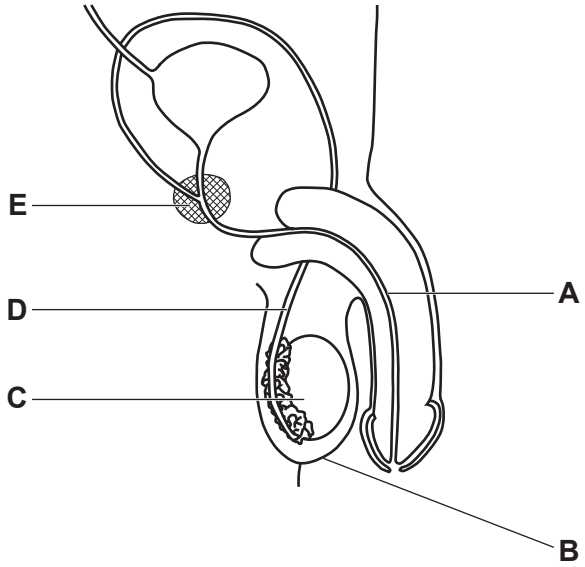

Fig. 7.1

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]

View solution

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

View solution

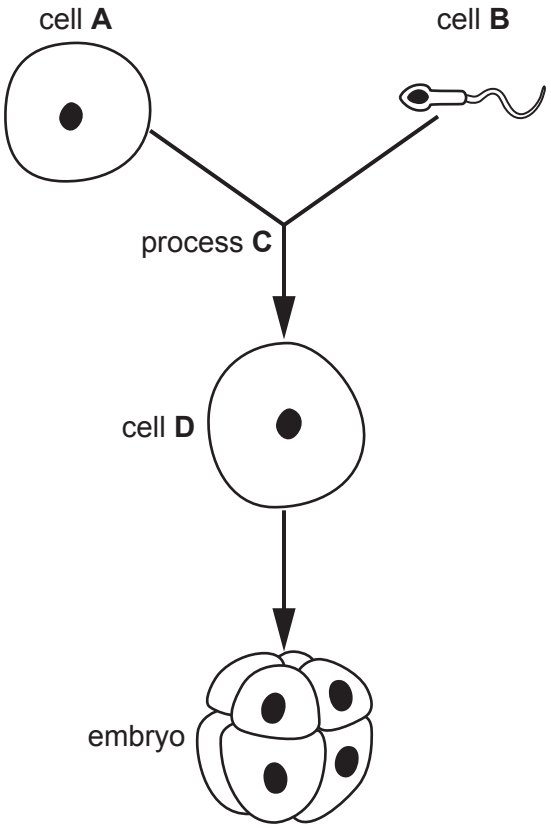

Fig. 7.2

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

cell **A** .....

cell **B** .....

process **C** .....

cell **D** .....

[4]

[Total: 10]

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

View solution

..... [1]

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

View solution

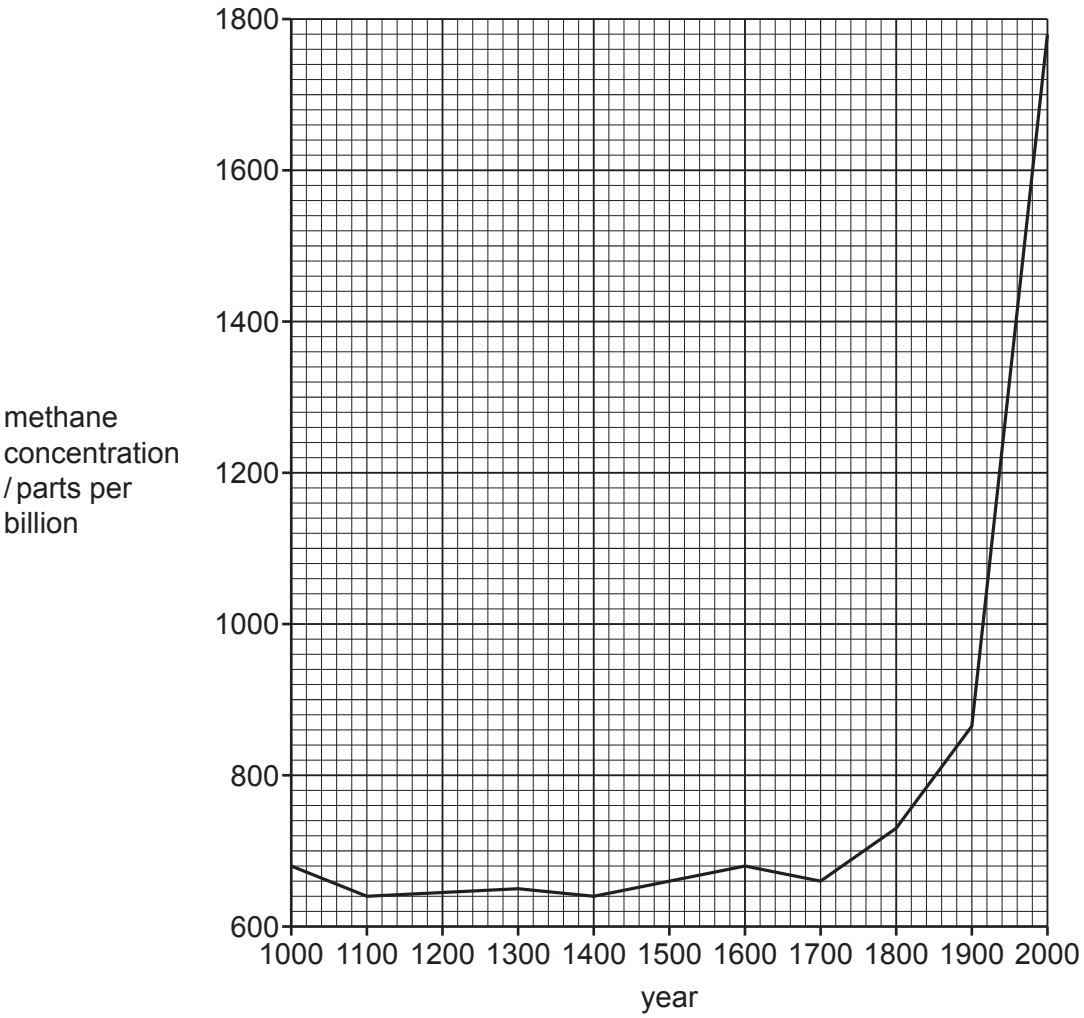

Fig. 8.1

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. View solution

..... [1]

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

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

..... [1]

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

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]

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