Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME	
CENTRE NUMBER	
CANDIDATE NUMBER	

BIOLOGY **0610/33**

Paper 3 Theory (Core) **May/June 2018**

1 hour 15 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

This syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **17** printed pages and **3** blank pages.

DC (SC/FC) 145578/4

CAMBRIDGE International Examinations

[Turn over

1 **(a)** Scientists classify organisms into groups.

State **one** feature that is used to identify vertebrates.

.....[1]

(b) Vertebrates are classified into five groups.

Fig. 1.1 shows three vertebrates found in Australia.

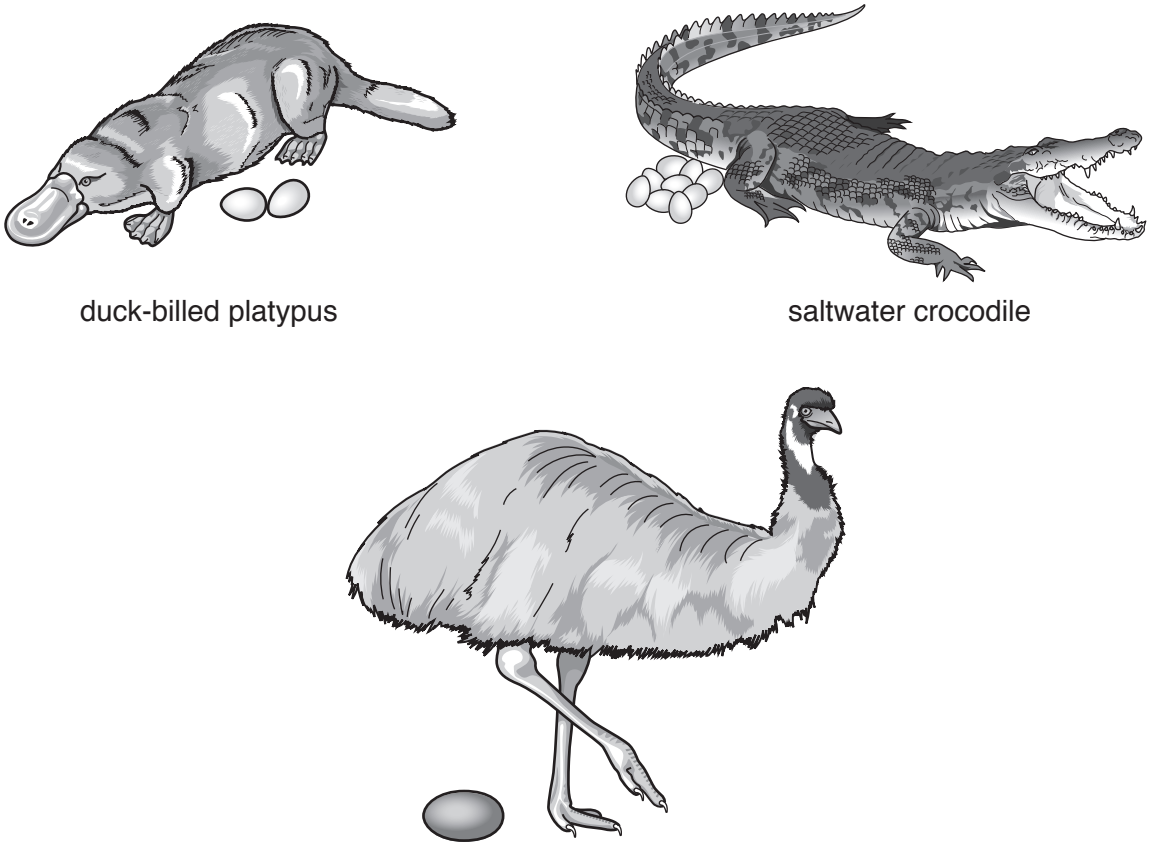

Fig. 1.1

The emu, the saltwater crocodile and the duck-billed platypus each belong to a different vertebrate group.

All three animals lay eggs that develop and hatch on land.

(i) State the name of the vertebrate group to which emus belong and give **one** feature of this group that is visible in Fig. 1.1.

group .....

visible feature .....

.....

[2]

(ii) State the name of the vertebrate group to which crocodiles belong and give **one** feature of this group that is visible in Fig. 1.1.

group .....

visible feature .....

.....

[2]

(iii) The duck-billed platypus is classified as a mammal.

Give evidence from Fig. 1.1 for and against classifying the duck-billed platypus as a mammal.

evidence for .....

.....

.....

evidence against .....

.....

.....

[3]

(c) There are **two** groups of vertebrates which lay eggs that develop in water.

State the name of these two groups of vertebrates.

1 .....

2 .....

[2]

[Total: 10]

[Turn over

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2 **(a)** **(i)** State the word equation for photosynthesis.

.....[2]

(ii) State the name of the green substance plants need for photosynthesis.

.....[1]

(b) A group of students used an aquatic plant to investigate the effect of temperature on the rate of photosynthesis.

Fig. 2.1. shows the apparatus the students used.

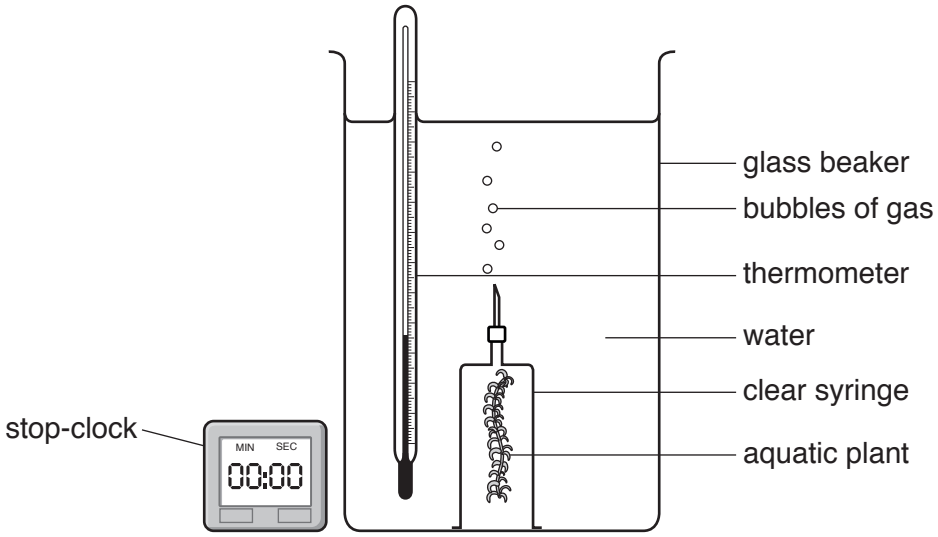

Fig. 2.1

The students counted the number of bubbles of gas the aquatic plant produced, in two minutes, at different temperatures.

Fig. 2.2 shows a graph of their results.

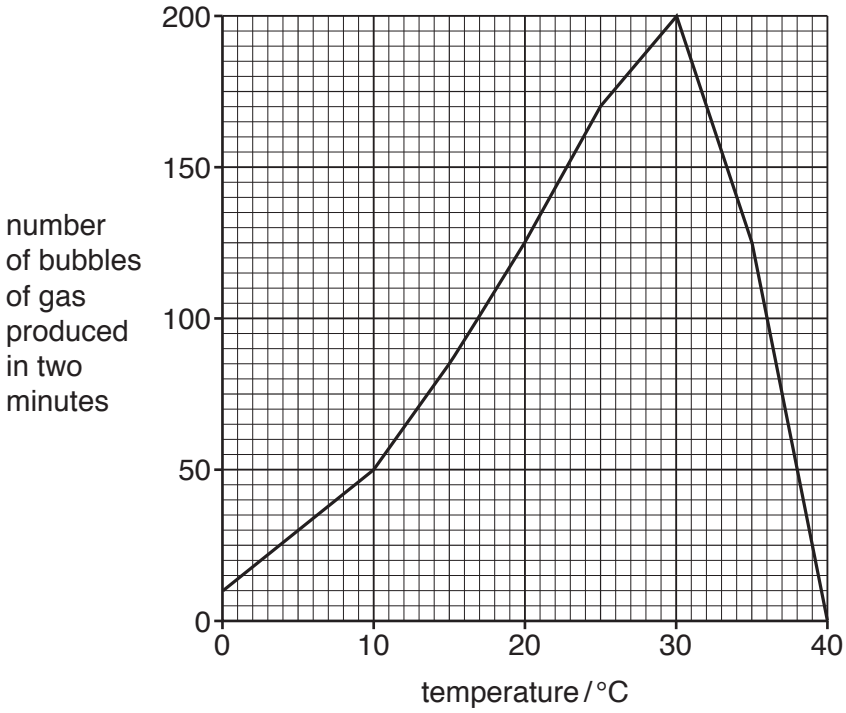

Fig. 2.2

(i) State the temperature at which the aquatic plant produced the most bubbles of gas in two minutes.

.....°C [1]

(ii) Use Fig. 2.2 to find the number of bubbles of gas produced by the aquatic plant, in two minutes, at 15 °C and at 25 °C.

15 °C .....

25 °C .....

[1]

(iii) Use your answer to **(b)(ii)** to calculate the percentage increase in the number of bubbles of gas produced by the aquatic plant at 15 °C and at 25 °C.

Show your working.

..... %

[2]

(c) Describe the results shown in Fig. 2.2.

.....

.....

.....

.....

.....

.....[3]

(d) State **one** factor, other than temperature, that affects the rate of photosynthesis.

.....[1]

[Total: 11]

3 A man is overweight.

Fig. 3.1 shows his diet. He consumes 15 000 kJ a day.

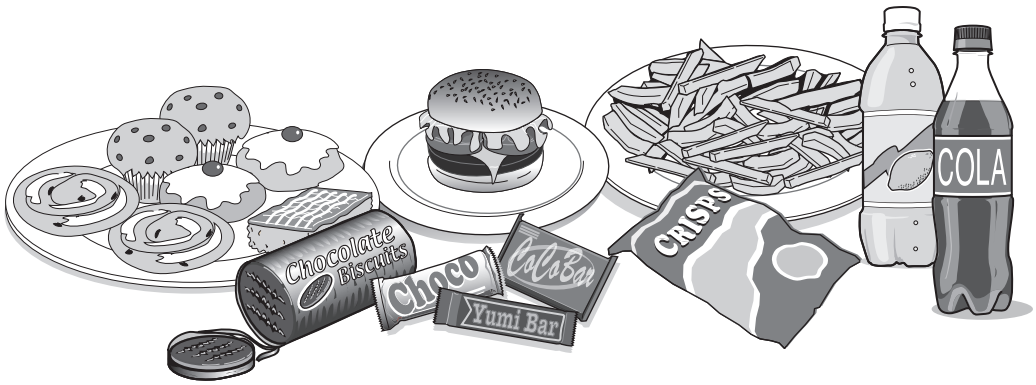

Fig. 3.1

(a) (i) Suggest why the diet shown in Fig. 3.1 is **not** considered to be a balanced diet.

.....

.....

.....

.....

.....

.....[2]

(ii) Suggest and explain how the man could reduce his weight.

.....

.....

.....

.....

.....[2]

(b) The following sentences describe the importance of some foods.

Choose words from the list to complete the sentences

anaemia	**constipation**	**calcium**	**fat**	**iron**	**hair**
scurvy	**teeth**	**vitamin C**	**vitamin D**	**water**	

Oranges and lemons are fruits which are a good source of .....

and help to prevent ..... .

Foods made from milk are important for making healthy bones and

..... because they are a good source of

..... .

Fibre is important because it helps to prevent ..... .

[5]

(c) Explain how a woman's dietary needs will change when she is pregnant.

.....

.....

.....

.....

.....

.....

.....

.....

.....[4]

[Total: 13]

4 **(a)** Fig. 4.1 shows a mosquito feeding on human blood.

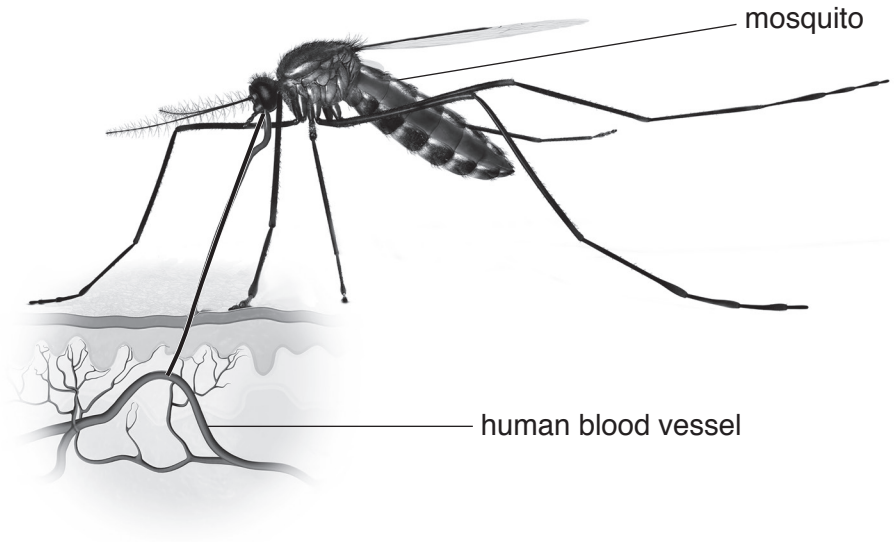

Fig. 4.1

(i) Mosquitoes can carry transmissible diseases such as malaria.

Define the term *transmissible disease*.

.....

.....

.....

.....[2]

(ii) Using information from Fig. 4.1, suggest how the mosquito is adapted for feeding on human blood.

.....

.....

.....[1]

(b) **(i)** The human body has a number of defences against disease.

State the name of the mechanical barrier which is broken by the mosquito.

.....[1]

(ii) Some components of blood defend the body against disease.

Table 4.1 contains the names of three of the components of blood.

It also states three defence mechanisms.

Complete Table 4.1 by placing a tick (✓) in the box that matches each defence mechanism to the correct component of blood.

Table 4.1

defence mechanism	component of blood		
	platelets	red blood cells	white blood cells
antibody production			
blood clotting			
phagocytosis			

[3]

(c) The body also has chemical barriers against disease.

State the name of **two** chemical barriers in the body.

1 .....

2 .....

[2]

[Total: 9]

5 Fig. 5.1 shows part of the carbon cycle.

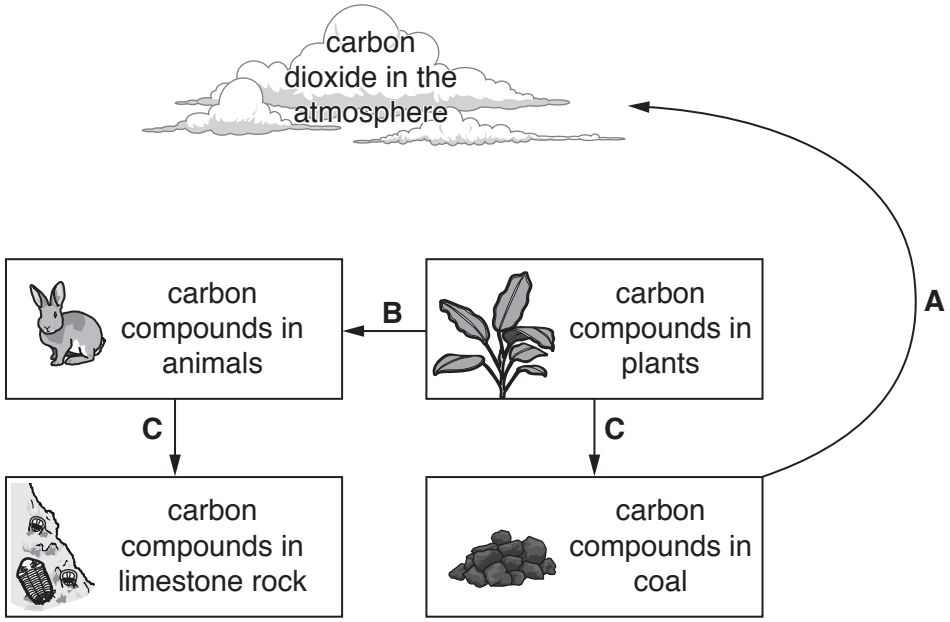

Fig. 5.1

(a) Identify the processes shown by arrows **A**, **B** and **C** on Fig. 5.1.

Choose words from the list.

combustion **decomposition** **excretion** **feeding** **fossilisation**

process **A** .....

process **B** .....

process **C** .....

[3]

(b) **(i)** On Fig. 5.1 draw **one** arrow to represent photosynthesis.

Label this arrow with a letter **D**. [1]

(ii) On Fig. 5.1 draw **one** arrow to represent respiration.

Label this arrow with a letter **E**. [1]

(c) The concentration of carbon dioxide in the atmosphere is increasing.

(i) Describe **two** possible causes of the increased carbon dioxide concentration in the atmosphere.

.....

.....

.....

.....

.....[2]

(ii) State **two** adverse effects of the increase in carbon dioxide concentration in the atmosphere.

1 .....

.....

2 .....

.....

[2]

(iii) Carbon dioxide is a greenhouse gas.

State the name of **one other** greenhouse gas.

.....[1]

[Total: 10]

6 **(a)** Organisms pass on their genetic information in their gametes.

(i) State the name of the type of cell division that produces gametes.

.....[1]

(ii) State the name of the cell formed when the nuclei of two gametes join together.

.....[1]

(b) A rabbit that was homozygous for black fur was crossed with a rabbit that was homozygous for brown fur.

All of their offspring had black fur.

This is shown in Fig. 6.1.

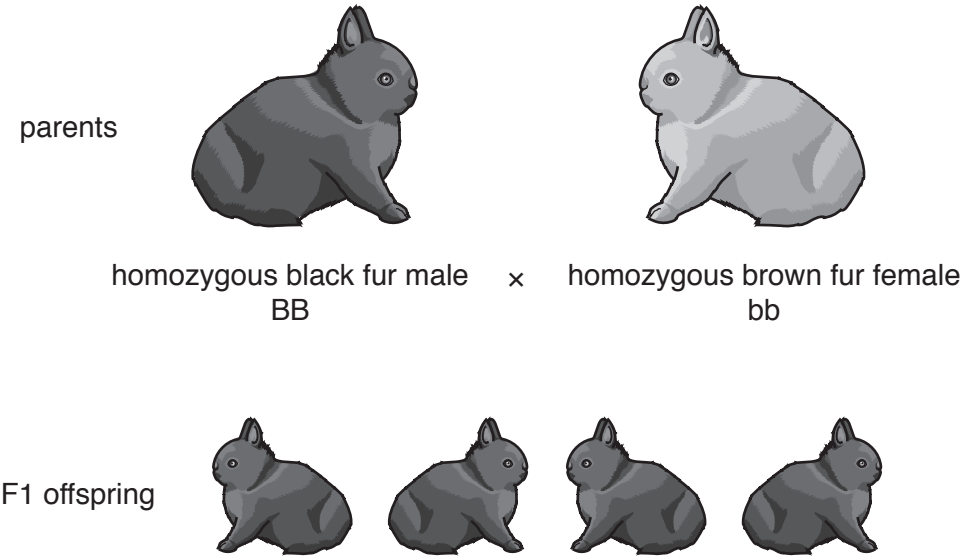

Fig. 6.1

(i) Define the term *homozygous*.

.....

.....

.....[1]

(ii) State the dominant allele for fur colour and give a reason for your answer.

dominant allele .....

reason .....

.....

[2]

(c) The F1 offspring all have the same phenotype as the male parent but their genotype is not the same as the male parent.

State how the *phenotype* of an organism is different to its *genotype*.

.....

.....

.....[1]

(d) A rabbit with brown fur is mated with one of the F1 rabbits with black fur.

Complete the genetic diagram to show the possible fur colours that could occur from this mating.

parental phenotypes brown fur × black fur

parental genotypes bb × Bb

gametes ..... , ... + ... , ...

offspring genotypes ....

offspring phenotypes ....

ratio ..... *brown* : ..... *black*

[4]

(e) New breeds of rabbits can be produced by selective breeding.

Describe the stages in the process of selective breeding.

.....

.....

.....

.....

.....

.....

.....[3]

[Total: 13]

7 Fig. 7.1 is part of a newspaper article about pollution.

How safe is your water?

A source of safe drinking water is important for life.

Water is also important for transport, industry and for producing crops to feed people.

Many of the world's largest cities and towns developed near large rivers or lakes.

The increase in population has resulted in many of the rivers and lakes becoming polluted.

More water treatment plants are needed to deal with raw sewage and to produce water free from pathogens.

Fig. 7.1

(a) State **four** sources of water pollution other than raw sewage.

1 .....

2 .....

3 .....

4 .....

[4]

(b) Outline the steps in the treatment of raw sewage that make it safe to return to the environment.

.....

.....

.....

.....

.....

.....

.....[3]

(c) Define the term pathogen.

.....[1]

[Total: 8]

8 Fig. 8.1 shows the human female reproductive system.

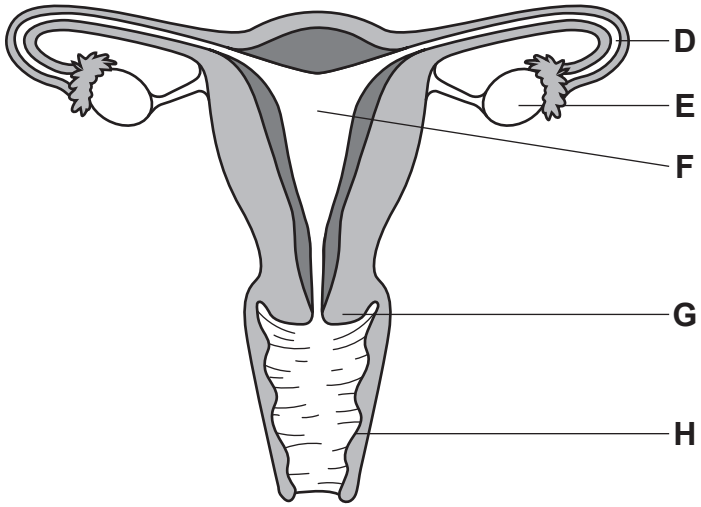

Fig. 8.1

(a) Use the letters on Fig. 8.1 to identify:

the cervix .....

the oviduct .....

the uterus .....

the vagina .....

[4]

(b) On Fig. 8.1, write an **X** to show where female gametes are produced. [1]

(c) State the name of the structure where fertilisation normally takes place.

.....[1]

[Total: 6]

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