Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

BIOLOGY **0610/32**

Paper 3 Theory (Core) **May/June 2017**

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.

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

This document consists of **16** printed pages and **4** blank pages.

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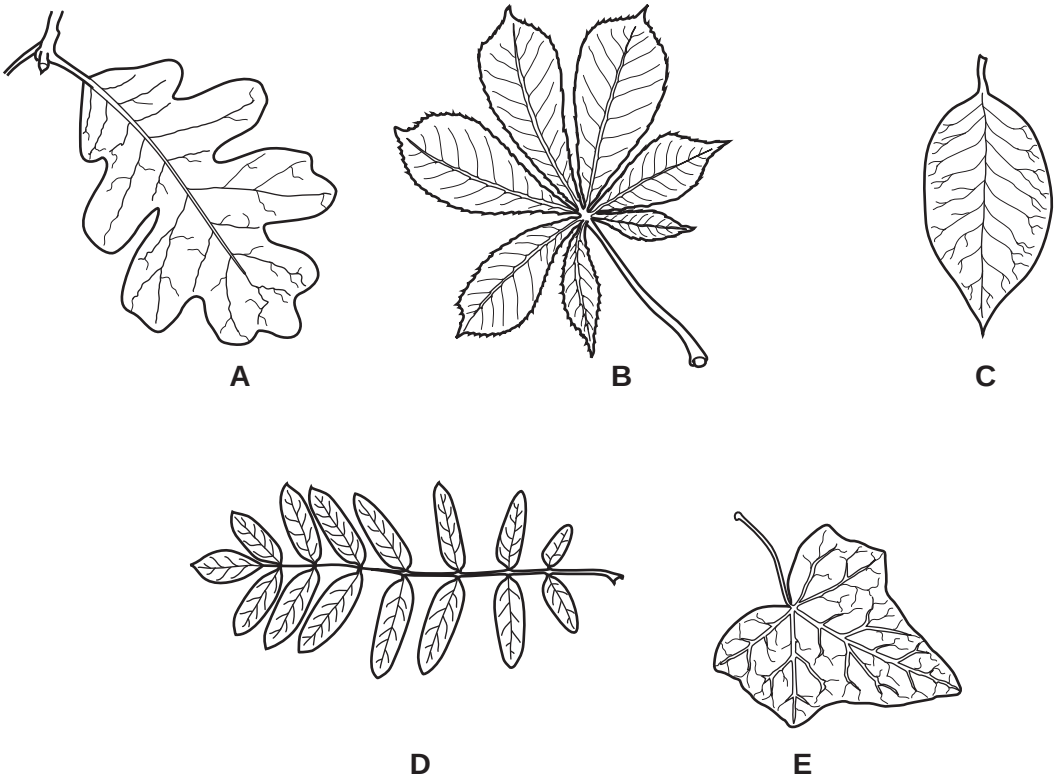
1 Fig. 1.1 shows five whole leaves from different trees.



not to scale

Fig. 1.1

Use the key to identify the leaves in Fig. 1.1 and write the answers in Table 1.1.

Table 1.1

		key	name of tree	letter
1	(a)	leaf is a single leaf shape	go to 2	
	(b)	leaf is divided into several parts called leaflets	go to 4	
2	(a)	veins branch from a long middle vein	go to 3	
	(b)	veins branch from a single point at the stalk	*Hedera*	
3	(a)	leaf is oval and has a smooth edge	*Magnolia*	
	(b)	leaf is not oval and has a lobed edge	*Quercus*	
4	(a)	leaf has leaflets joined at one point on the stalk	*Aesculus*	
	(b)	leaf has leaflets joined at different points along the stalk	*Sorbus*	

[4]

[Total: 4]

[Turn over

2 Fig. 2.1 is a diagram of the alimentary canal.

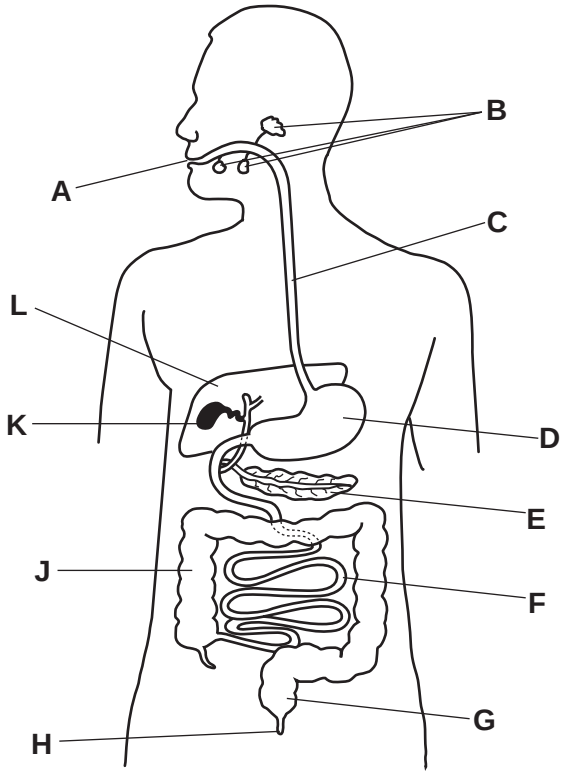


Fig. 2.1

(a) Table 2.1 shows some of the processes that occur in the alimentary canal.

Use the letters in Fig. 2.1 to identify where the processes occur.

Write your answers in Table 2.1.

Table 2.1

process	letter
ingestion	
mechanical digestion	
secretion of protease	
absorption of nutrients	
egestion	

[5]

(b) Chemical digestion is the breakdown of large, insoluble molecules into smaller, soluble molecules. Digestive enzymes such as lipase are used in this process.

(i) Define the term *enzyme*.

.....

.....

.....[2]

(ii) The enzyme lipase breaks down fats.

State the end products of fat digestion.

1 .....

2 .....
[2]

(iii) List the **three** chemical elements that are found in fats.

.....[1]

(iv) Fat is an important component of a balanced diet.

Draw circles around **two** foods that are a good source of fat.

beans	**butter**	**pasta**
oranges	**rice**	**olive oil**

[2]

(v) State the names of **three** components of a balanced diet, other than fat.

1 .....

2 .....

3 .....
[3]

(vi) State **one** use in the body of fat.

.....

.....

.....[1]

[Total: 16]

3 Hormones are chemical substances produced by glands.

The column on the left shows the names of some hormones.

The column on the right shows the names of some glands.

(a) Draw one straight line from the hormone to the gland that secretes it.

Draw four lines.

hormone	**gland**
testosterone	ovary
oestrogen	adrenal
adrenaline	pancreas
insulin	salivary
	testes

[4]

(b) State the function of the hormone insulin.

.....

.....

.....[1]

(c) Ovaries are part of the female reproductive system. Ovaries secrete hormones and also release the female gamete.

(i) Name the female gamete.

.....[1]

(ii) State **two** adaptive features of sperm.

1 .....

2 .....

[2]

(iii) Name the type of cell division that produces gametes.

.....[1]

(d) Adrenaline is the hormone that is released in 'fight or flight' situations.

(i) Describe **two** effects that adrenaline has on the body.

.....

.....

.....

.....

.....[2]

(ii) Table 3.1 shows a list of activities.

Tick the boxes that would result in a release of adrenaline.

Table 3.1

bungee jumping	
sitting an exam	
going for a gentle walk	
reading a textbook	
drinking water	
hearing a sudden noise	
painting a picture	

[3]

[Total: 14]

4 **(a)** Use words from the list to complete the definition of ***anaerobic*** *respiration*.

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

carbon dioxide **cells** **chemical** **chloroplasts** **energy**

nucleus **nutrient** **oxygen** **physical**

The ..... reactions in ..... that break down .....

molecules to release energy without using ..... . [4]

(b) 100 g of glucose releases 1600 kJ of energy during aerobic respiration.

The energy released during anaerobic respiration is only 5% of the energy released during aerobic respiration.

(i) Calculate the energy released from 100 g of glucose during **anaerobic** respiration.

Show your working.

..... kJ
[2]

(ii) State **two** substances made by **aerobic** respiration.

1 .....

2 .....
[2]

(iii) State **three** uses of the energy released by respiration in the body.

1 .....

2 .....

3 .....
[3]

(c) State **one** way anaerobic respiration in muscles during vigorous exercise differs from the anaerobic respiration that occurs in yeast.

.....

.....

.....[1]

(d) State **one** industrial process that uses anaerobic respiration in yeast.

.....

.....[1]

[Total: 13]

5 Fig. 5.1 shows a diagram of part of the human circulatory system.

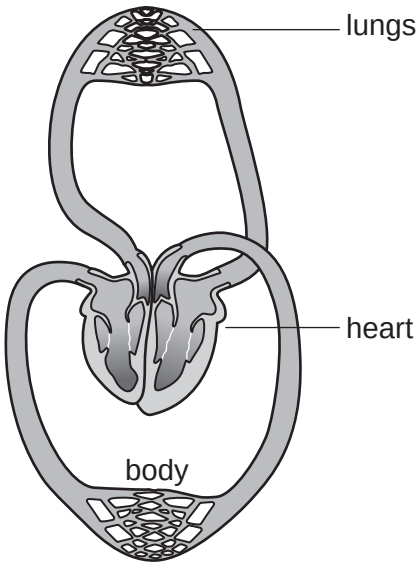


Fig. 5.1

(a) On Fig. 5.1 label the:

- pulmonary artery
- pulmonary vein.

[2]

(b) State **two** ways the structure of a vein differs from the structure of an artery.

1 .....

2 .....

[2]

(c) Table 5.1 shows the components of the blood.

Complete Table 5.1 to show the functions of these components.

Table 5.1

component of blood	function
red blood cells	
white blood cells	
platelets	
plasma	

[4]

[Total: 8]

6 Fig. 6.1 is a drawing of a seed that has germinated.

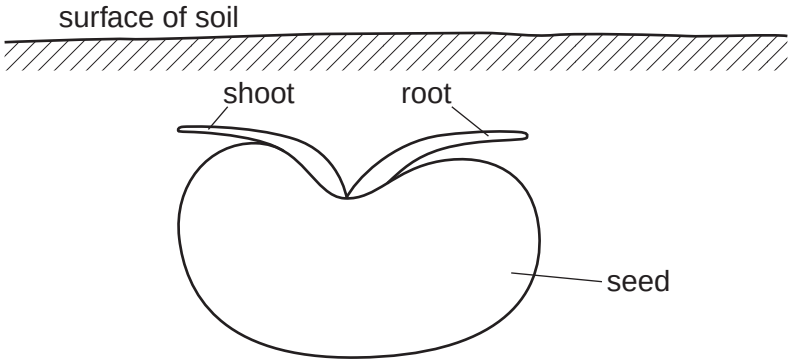


Fig. 6.1

(a) (i) Draw **two** arrows on Fig. 6.1 to show the direction of growth for the root **and** shoot. [1]

(ii) Name the type of growth response that would be shown by the root in Fig. 6.1.

.....[1]

(b) Fig. 6.2 shows the apparatus set up by a student to investigate the germination of seeds.

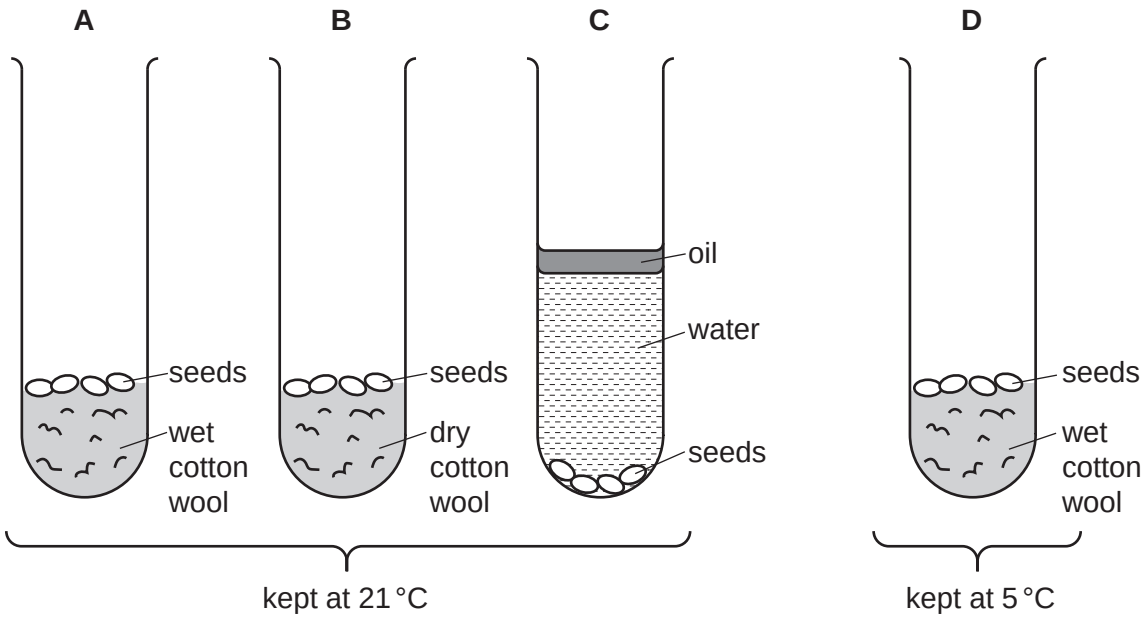


Fig. 6.2

The seeds in test-tube **A** were the only ones which germinated.

Explain why the seeds in test-tubes **B**, **C** and **D** did **not** germinate.

B .....

.....

C .....

.....

D .....

.....

[3]

(c) After the seeds have germinated they will absorb mineral ions. Plants need mineral ions for healthy growth.

(i) Complete Table 6.1 to show the function of nitrate and magnesium ions in a plant.

Table 6.1

mineral ion	function in plants
nitrate	
magnesium	

[2]

(ii) State where the mineral ions enter a plant.

.....

.....[1]

[Total: 8]

7 Fig. 7.1 shows a photograph of *Ursus maritimus* (polar bear).

Fig. 7.1

(a) Polar bears live in and around the Arctic Circle, surviving in extremely cold conditions.

Describe **and** explain **one visible** adaptive feature that enables the polar bear to survive in a cold environment.

feature .....

.....

explanation .....

.....

.....

[2]

(b) Polar bears have adapted over time to live in the cold arctic environment through a process called natural selection.

Describe the process of natural selection.

.....

.....

.....

.....

.....

.....

.....

.....

.....[4]

(c) Polar bears are an endangered species.

Suggest reasons **why** polar bears have become endangered and how they could be conserved.

.....

.....

.....

.....

.....

.....

.....

.....

.....[4]

[Total: 10]

8 Fig. 8.1 is a graph that shows the percentage of males and females in different age groups that smoke cigarettes every day.

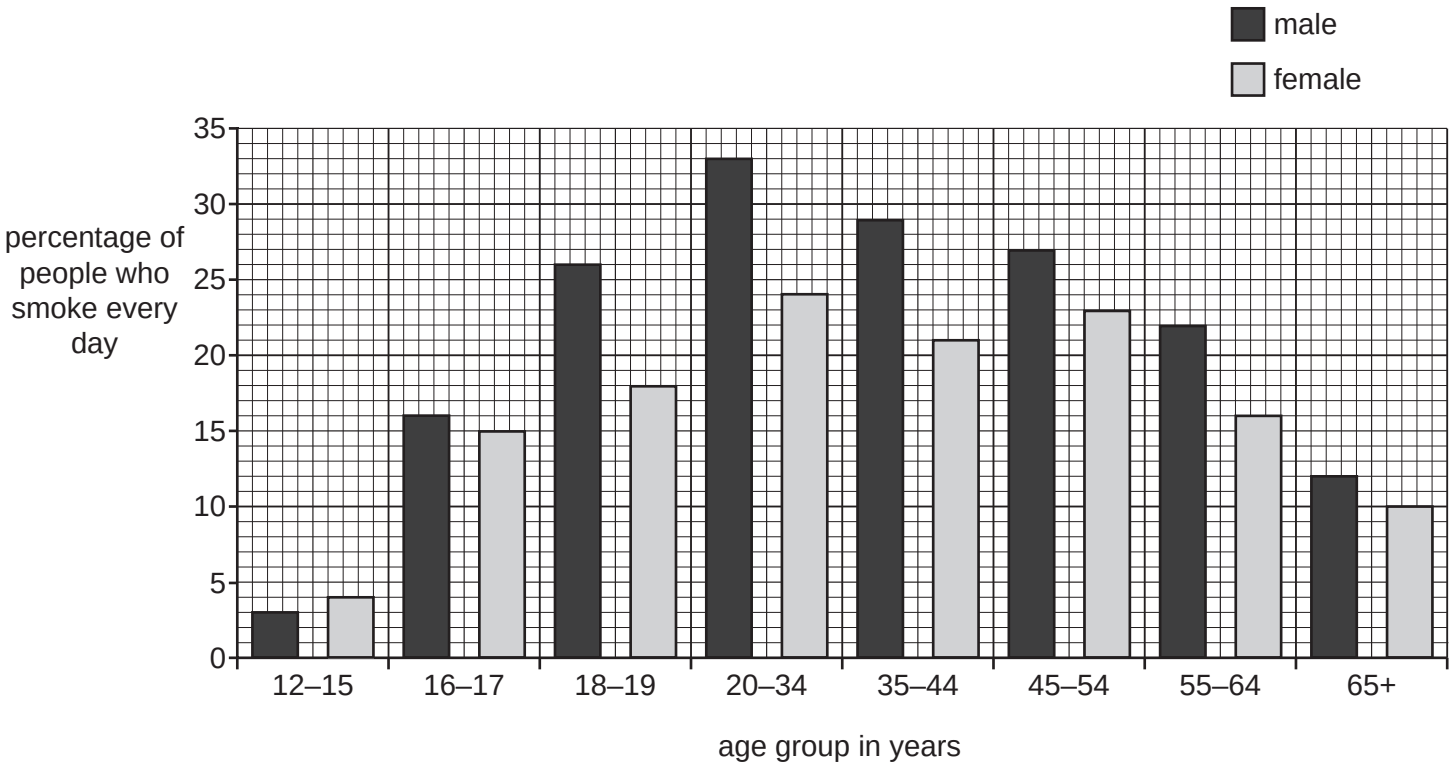


Fig. 8.1

(a) Use Fig. 8.1 to answer these questions.

(i) State the age group **and** gender that is most likely to smoke cigarettes every day.

.....[1]

(ii) State the percentage of 55–64 year old females who smoke cigarettes every day.

.....% [1]

(b) Table 8.1 shows the components of cigarette smoke.

Complete Table 8.1 to show the effects of the components of cigarette smoke on the body.

Table 8.1

component in cigarette smoke	effect on the body
carbon monoxide	
tar	
nicotine	

[3]

(c) Smoking is one of the risk factors that contributes to coronary heart disease.

State **two other** risk factors.

1 .....

2 .....

[2]

[Total: 7]

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