Cambridge Assessment International Education

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CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

8670198522

BIOLOGY **0610/32**

Paper 3 Theory (Core) **February/March 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.

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1 **(a)** Fig. 1.1 shows six species of reptiles.

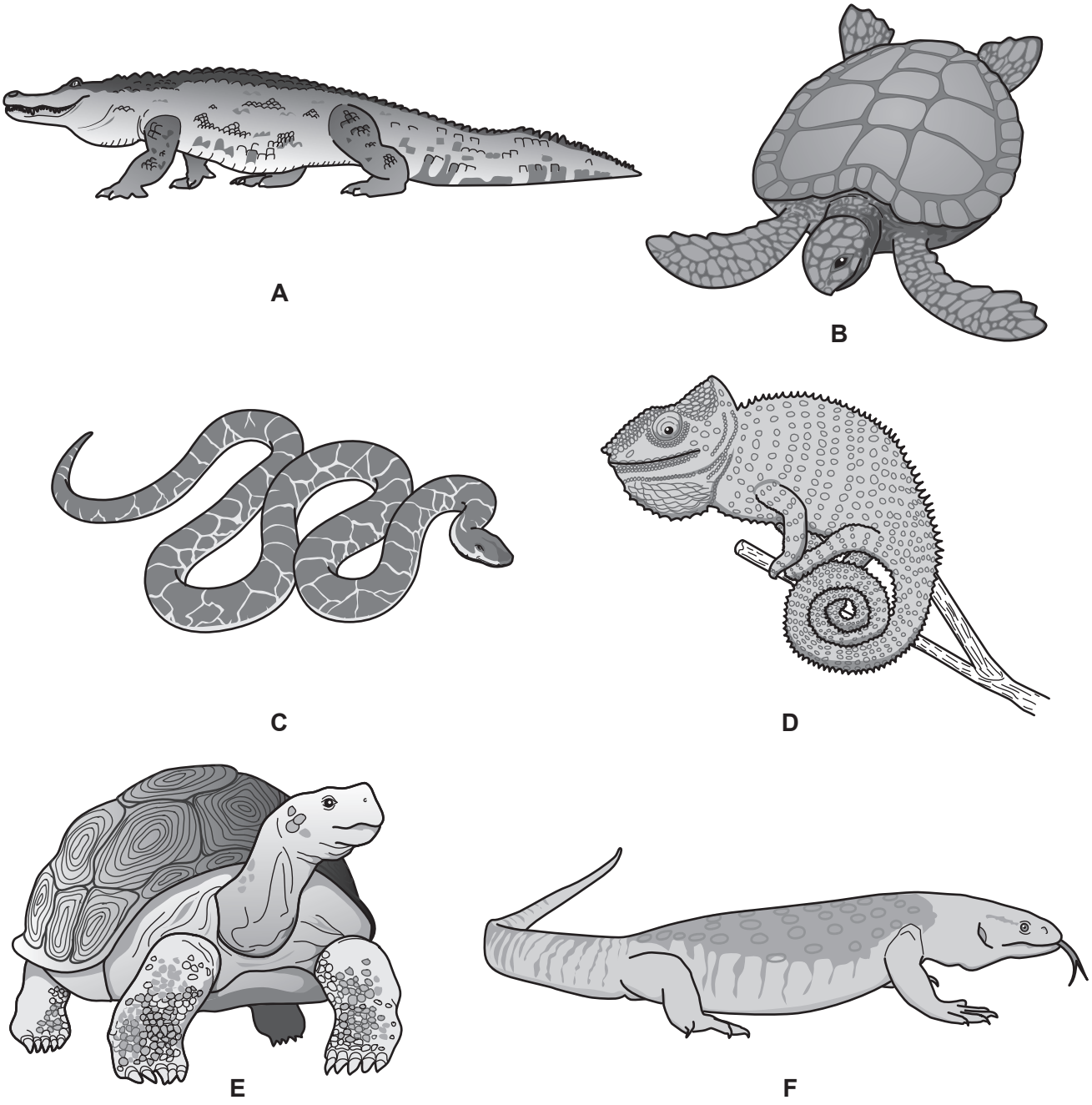

Fig. 1.1

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(i) Use the key to identify each species. Write the letter of each species (**A**–**F**) in the correct empty box beside the key.

Key:

1 (a)	organism has a shell (hard covering on its back)	go to 2	
(b)	organism does not have a shell	go to 3	
2 (a)	organism has flat limbs (flippers)	*Caretta caretta*	
(b)	organism has legs and feet	*Chelonoidis nigra*	
3 (a)	organism has limbs	go to 4	
(b)	organism has a long body and no limbs	*Crotalus viridis*	
4 (a)	organism has ridges on its back	go to 5	
(b)	organism has no ridges on its back	*Varanus bengalensis*	
5 (a)	organism has a coiled tail	*Chamaeleo calyptratus*	
(b)	organism has a straight tail	*Alligator mississippiensis*	

[5]

(ii) Define the term species.

.....

.....

.....

.....

..... [2]

(b) The binomial system of naming organisms tells us the species and the genus of the organism.

State the genus name for *Chamaeleo calyptratus*.

..... [1]

(c) Table 1.1 shows some features of animals.

Place ticks (✓) next to **two** features of most reptiles.

Table 1.1

compound eyes	
fertilisation is internal	
wings	
lay eggs	
moist skin	

[2]

(d) State **two** features of cells that are shared by **all** living organisms.

1 .....

2 .....

[2]

[Total: 12]

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2 **(a)** A class of students measured their breathing rates during different activities.

Average breathing rates for the class were calculated.

Student **A** compared her own breathing rates to the average breathing rates of the class.

Fig. 2.1 shows the results.

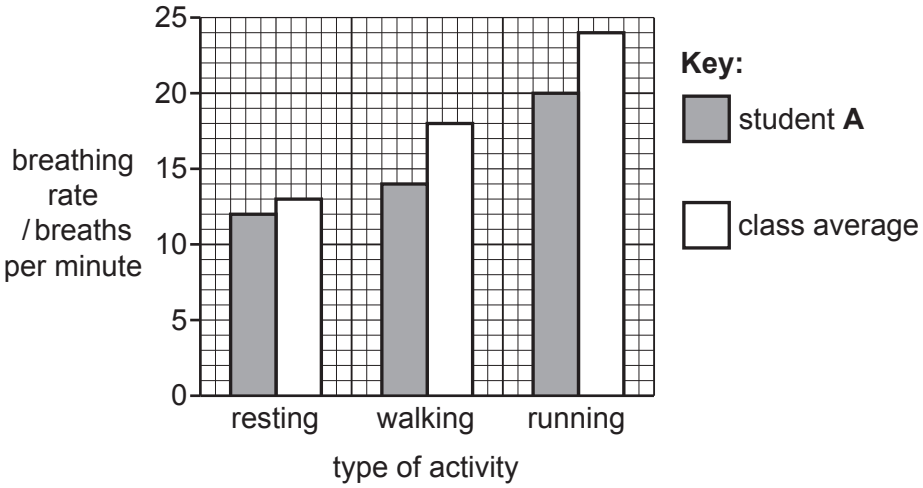

Fig. 2.1

(i) Compare student **A**'s results with the class averages.

.....

.....

.....

.....

..... [2]

(ii) Calculate the percentage increase in breathing rate between resting and running for student **A**.

Give your answer to the nearest whole number.

.....%
[2]

(b) State **two** ways in which the composition of inspired air differs from expired air.

1 .....

2 .....
[2]

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(c) Fig. 2.2 is a diagram of the human gas exchange system.

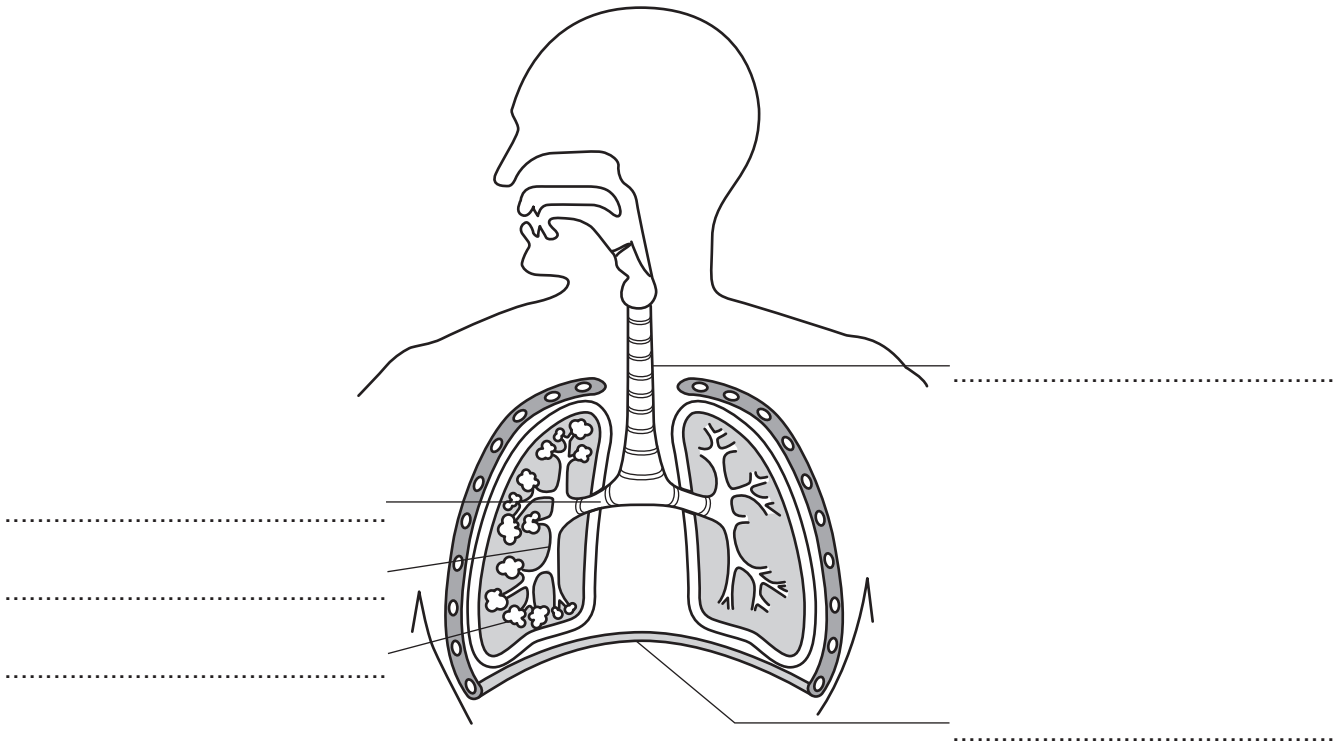


Fig. 2.2

Complete Fig. 2.2 by labelling these structures in the spaces provided:

- alveoli
- bronchus
- bronchiole
- diaphragm
- trachea.

[3]

(d) A large surface area is a feature of gas exchange surfaces.

State **two other** features of gas exchange surfaces.

1 .....

2 .....

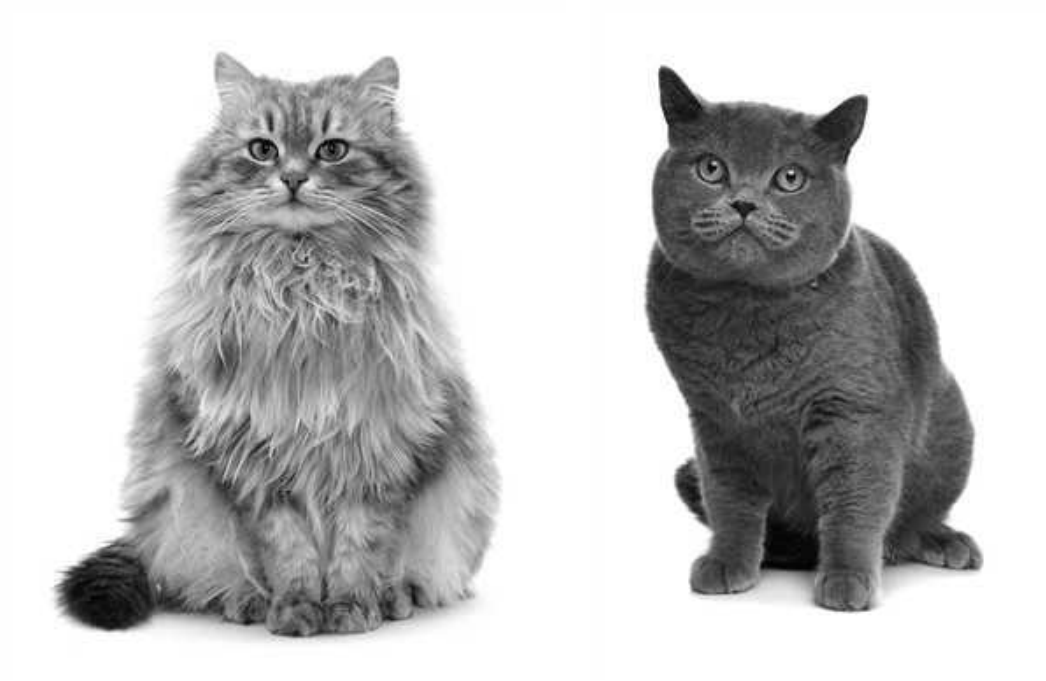
[2]

[Total: 11]

3 **(a)** The length of hair in cats is controlled by a single gene.

- The allele for short hair is dominant – **H**
- The allele for long hair is recessive – **h**

Fig. 3.1 is a photograph of two cats.



cat A **cat B**

Fig. 3.1

(i) Table 3.1 shows some of the genetic and physical features of the cats in Fig. 3.1.

Complete Table 3.1.

Table 3.1

	cat **A**	cat **B**
phenotype	long hair	.....
genotype	.....	**HH** or .....

[3]

(ii) State the genotype of a pure-breeding short-haired cat.

..... [1]

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(iii) Two cats with the genotypes **HH** and **hh** were bred together.

Predict the percentage of offspring that are heterozygous.

.....% [1]

(b) The statements describe features of continuous or discontinuous variation.

Identify the type of variation each statement describes.

Write the letter **C** for continuous variation or **D** for discontinuous variation in the spaces provided.

Height is an example of this type of variation. .....

There are no intermediate phenotypes with this type of variation. .....

This type of variation results in a limited number of phenotypes. .....
[2]

(c) A student wrote a definition of variation as:

'the similarities between individuals of the same kingdom'.

Identify the **two incorrect** words in the student's definition.

1 .....

2 .....
[2]

[Total: 9]

4 **(a)** A study estimated the percentage effectiveness of different types of birth control.

Table 4.1 shows examples of four different categories of birth control:

- barrier
- chemical
- natural
- surgical.

Table 4.1

example of birth control	category	percentage effectiveness
abstinence		100
contraceptive injection		94–99
femidom		79–95
IUS	chemical	99
vasectomy		100

(i) Complete Table 4.1 to show the different categories of each example of birth control.

One has been done for you. [4]

(ii) State the **two** most effective examples of birth control from Table 4.1.

..... [1]

(iii) State **two** examples of birth control from Table 4.1 that prevent the spread of sexually transmitted infections (STIs).

1 .....

2 .....
[2]

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(b) Complete the sentences about STIs using words from the list.

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

AIDS	**bacteria**	**blood**	**food**
infection	**ingesting**	**injecting**	
pregnancy	**sexually**	**variation**	**virus**

..... transmitted infections are transmitted via body fluids.

Human immunodeficiency ..... is an example of an STI.

HIV can be transmitted through transfusions of contaminated .....

and by ..... drugs.

HIV infection may eventually lead to ..... .

[5]

[Total: 12]

5 **(a)** Fig. 5.1 is a photograph of a giant panda.

Fig. 5.1

State the name of the vertebrate group that giant pandas belong to.

..... [1]

(b) Giant pandas live in mountainous regions in central China.

Researchers estimated the numbers of giant pandas in these areas over several years.

The results are shown in Fig. 5.2.

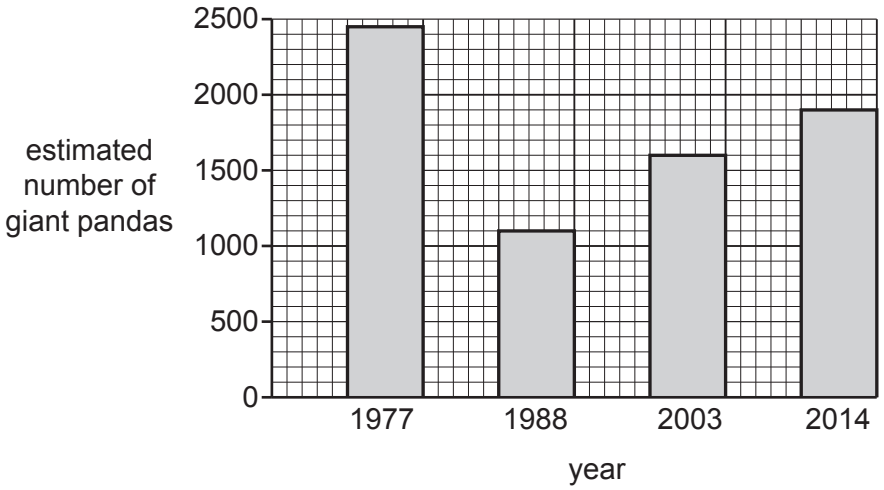

Fig. 5.2

The population of giant pandas was at its lowest in 1988.

(i) State the estimated number of giant pandas in 1988.

..... [1]

(ii) Calculate the change in population size of giant pandas between 1977 and 2014.

..... [1]

(c) In 1988 the population size became so low that giant pandas were considered an endangered species.

Suggest reasons why species such as the giant panda become endangered.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

(d) Giant pandas are no longer endangered due to successful conservation programmes.

Suggest how conservation programmes have helped to increase numbers of giant pandas.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 10]

6 **(a)** Complete the definition of the term transpiration.

Transpiration is the loss of water vapour from plant leaves by ..... of water at the surfaces of the ..... cells followed by diffusion of water vapour through the ..... .

[3]

(b) Fig. 6.1 is a graph showing how temperature affects water loss in a plant with many leaves.

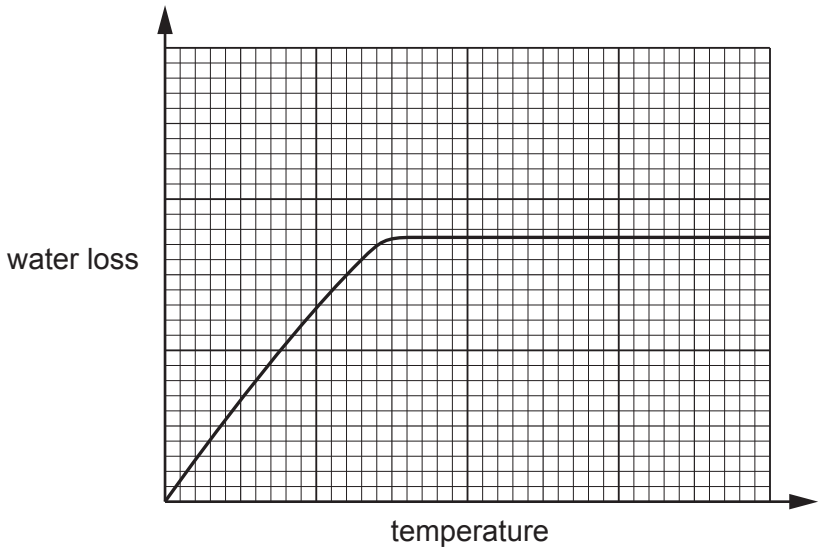

Fig. 6.1

(i) Half of the leaves were removed from the plant.

Predict the effect on water loss in this plant and sketch a line on Fig. 6.1 to show your prediction. [2]

(ii) Describe the effect of humidity on the rate of transpiration.

.....

.....

..... [1]

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(c) Water is an important substance for plants.

(i) Describe **two** uses of water in plants.

1 .....

2 .....
[2]

(ii) State the name of the vessels that transport water in plants.

..... [1]

(iii) State the name of the cells where water enters a plant.

..... [1]

[Total: 10]

7 **(a)** Fig. 7.1 is a diagram of the alimentary canal and associated organs.

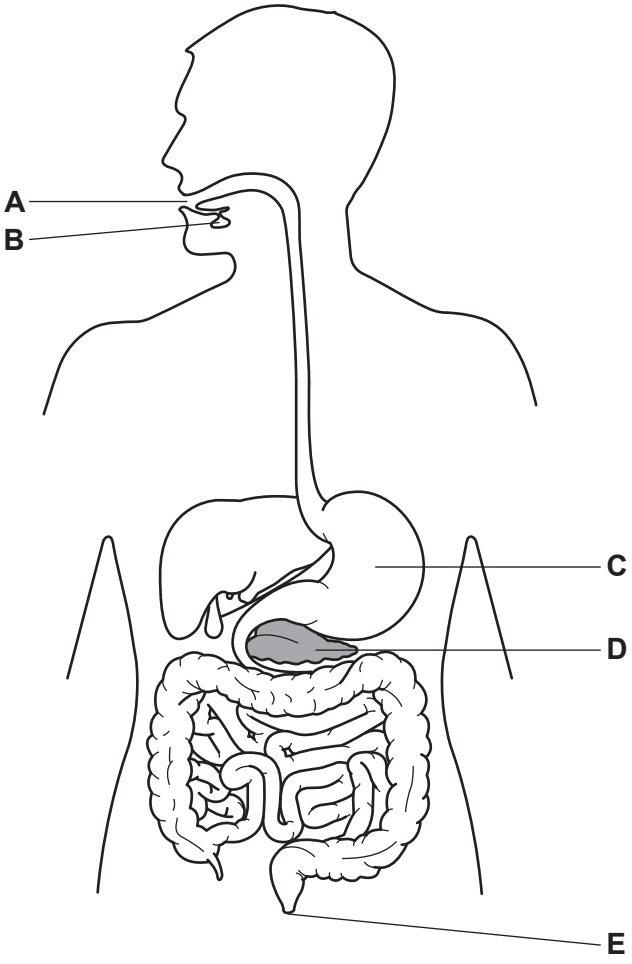

Fig. 7.1

The boxes on the left show the letters on Fig. 7.1.

The boxes in the middle show some of the names of the parts in Fig. 7.1.

The boxes on the right show the functions of the parts.

Draw lines to link each part with its correct letter and function.

letter on Fig. 7.1	name of the part	function
A	anus	contains hydrochloric acid to kill bacteria
B	mouth	production of amylase, protease and lipase
C	pancreas	production of saliva
D	salivary glands	site of egestion
E	stomach	site of ingestion

[6]

(b) The anus is part of the large intestine.

State the names of **two other** parts of the large intestine.

1 .....

2 .....

[2]

(c) State where mechanical digestion occurs in the alimentary canal.

..... [1]

(d) Protein and fats are two of the components of a balanced diet.

State the names of **three** other components of a balanced diet.

1 .....

2 .....

3 .....

[3]

[Total: 12]

8 **(a)** The box on the left contains the phrase ‘intensive livestock farming’.

The boxes on the right contain some sentence endings.

Draw **two** lines from the box on the left to make **two** correct sentences.

Intensive livestock farming	conditions increase the risk of the spread of disease.
	enables natural selection to take place.
	involves keeping livestock in their natural environment.
	results in lots of animal waste which can pollute water.

[1]

(b) Intensive farming produces large volumes of greenhouse gases.

(i) State **two** greenhouses gases produced by intensive farming.

1 .....

2 .....

[2]

(ii) State **one** effect of the pollution caused by greenhouse gases.

..... [1]

[Total: 4]

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