Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

0533431675

BIOLOGY **0610/22**

Paper 2 Core **October/November 2015**

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.

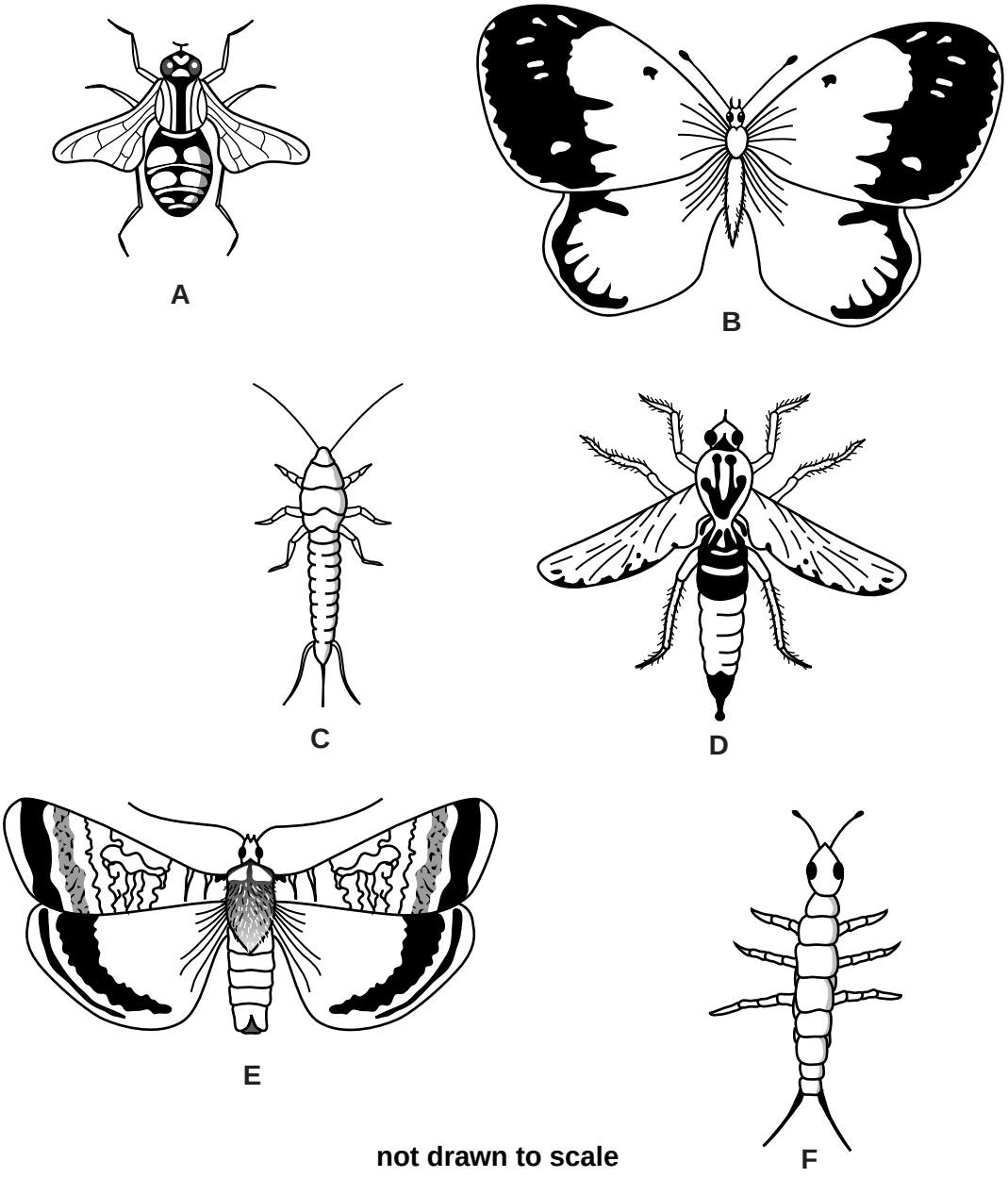
At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

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 **20** printed pages.

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1 Fig. 1.1 shows six different insects.



not drawn to scale

Fig. 1.1

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Use the key to identify the insects labelled **A**, **B**, **E** and **F**.

Write your answers in Table 1.1.

key

description			name of insect
1	(a)	insect has wings	go to 2
	(b)	insect has no wings	go to 3
2	(a)	one pair of wings	go to 4
	(b)	two pairs of wings	go to 5
3	(a)	two tail pieces	springtail
	(b)	three tail pieces	silverfish
4	(a)	abdomen is pointed	robber fly
	(b)	abdomen is rounded	hoverfly
5	(a)	antennae are pointed	large yellow moth
	(b)	antennae have rounded ends	clouded yellow butterfly

Table 1.1

insect	name of insect
A	
B	
E	
F	

[4]

[Total: 4]

2 **(a)** Fig. 2.1 shows some capillaries near the skin surface.

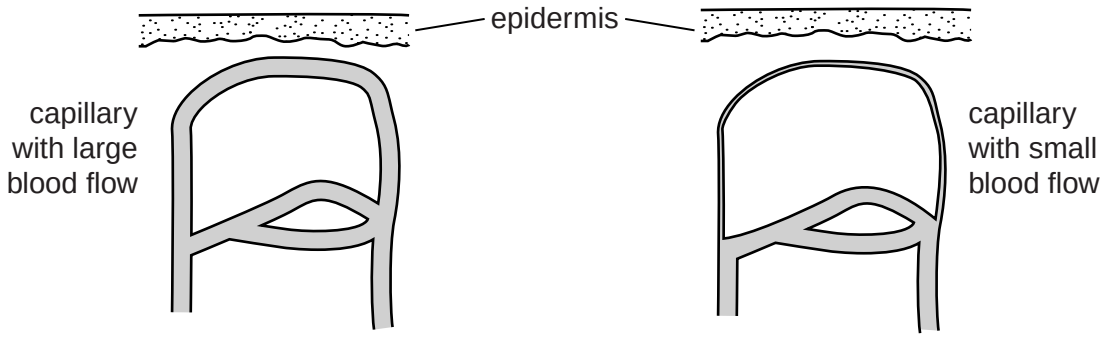


Fig. 2.1

(i) State the condition in the body that would cause these capillaries to have a large blood flow.

.....[1]

(ii) Describe and explain **one** other response of the body to the condition you have stated in **(a)(i)**.

.....

.....

.....

.....

.....[2]

(iii) Explain why mammals increase blood flow to the skin surface.

.....

.....

.....

.....[2]

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(b) A doctor will often use a thermometer to help in the diagnosis of illness.

Fig. 2.2 shows a thermometer and a range of body temperatures.

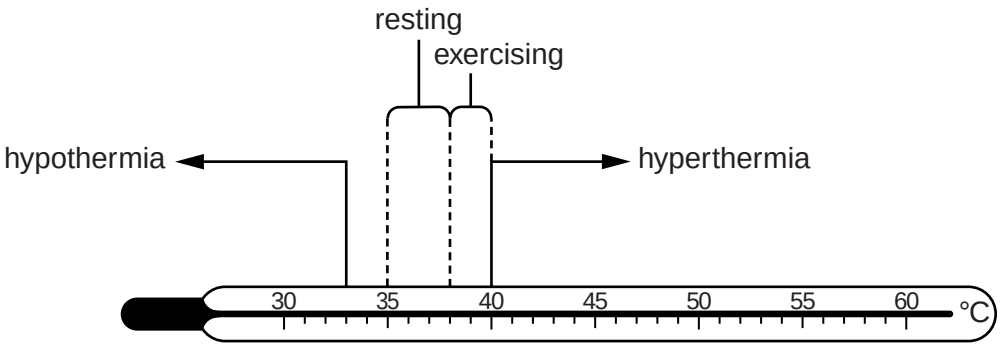


Fig. 2.2

State the temperature at which the body begins to suffer from hypothermia.

.....°C [1]

(c) Explain why the body temperature is slightly higher when exercising than when resting.

.....

.....

.....

.....

.....[2]

[Total: 8]

3 Fig. 3.1 represents the heart, part of the circulatory system and some of the organs supplied by this system.

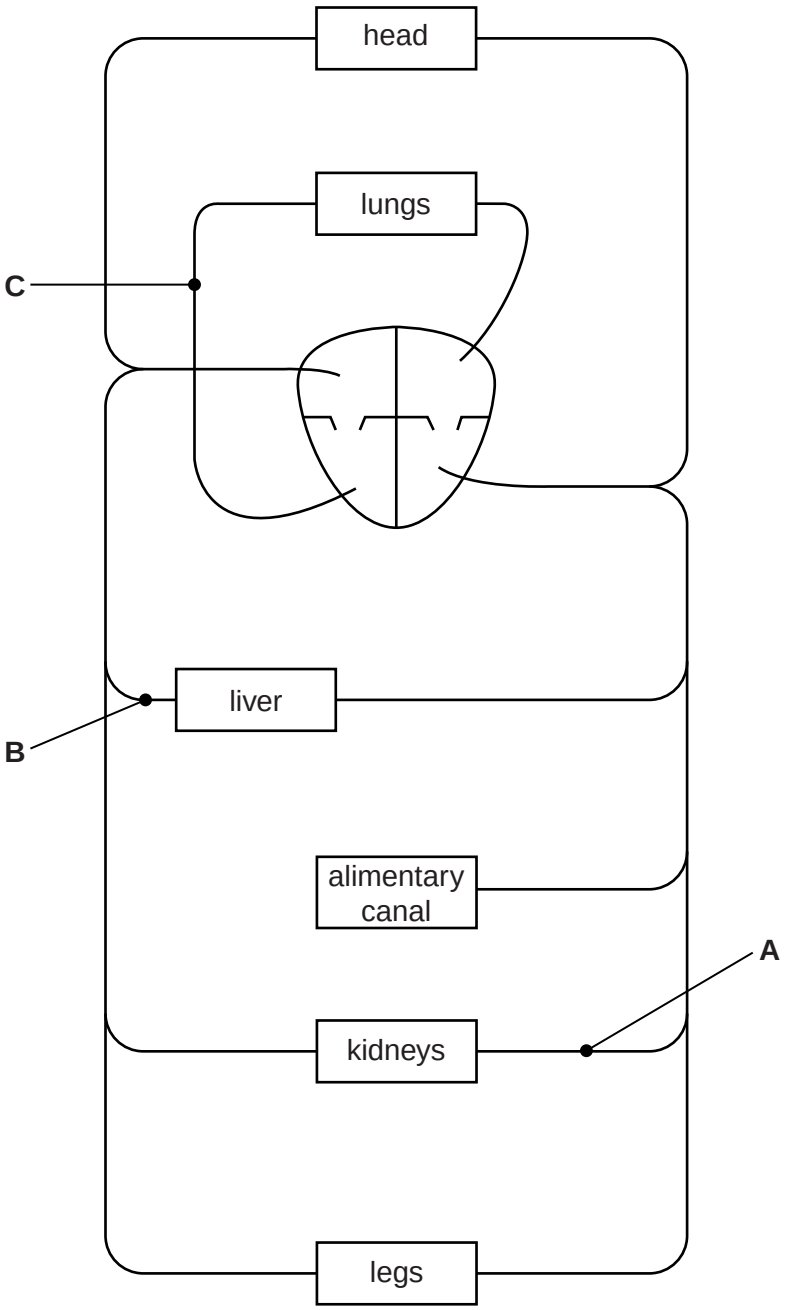


Fig. 3.1

(a) (i) On Fig. 3.1, draw an arrow on blood vessel **C** to show the direction of blood flow. [1]

(ii) Name the blood vessels labelled **A**, **B** and **C**, shown in Fig. 3.1.

A .....

B .....

C ..... [3]

(iii) On Fig. 3.1, draw a line to complete the circulation of blood for the alimentary canal. Label this line with the correct name of this blood vessel. [2]

(b) Table 3.1 shows some of the characteristics of blood vessels.

Complete Table 3.1 by writing:

- YES if the characteristic is present
- NO if the characteristic is absent.

Table 3.1

characteristic	blood vessel		
	aorta	vena cava	capillary
thick, elastic wall	YES		
valves present along length	NO		
transports oxygenated blood			NO
amino acids pass through walls		NO	

[4]

(c) Fig. 3.2 shows the heart of a person who has recovered from a mild heart attack as a result of having coronary heart disease.

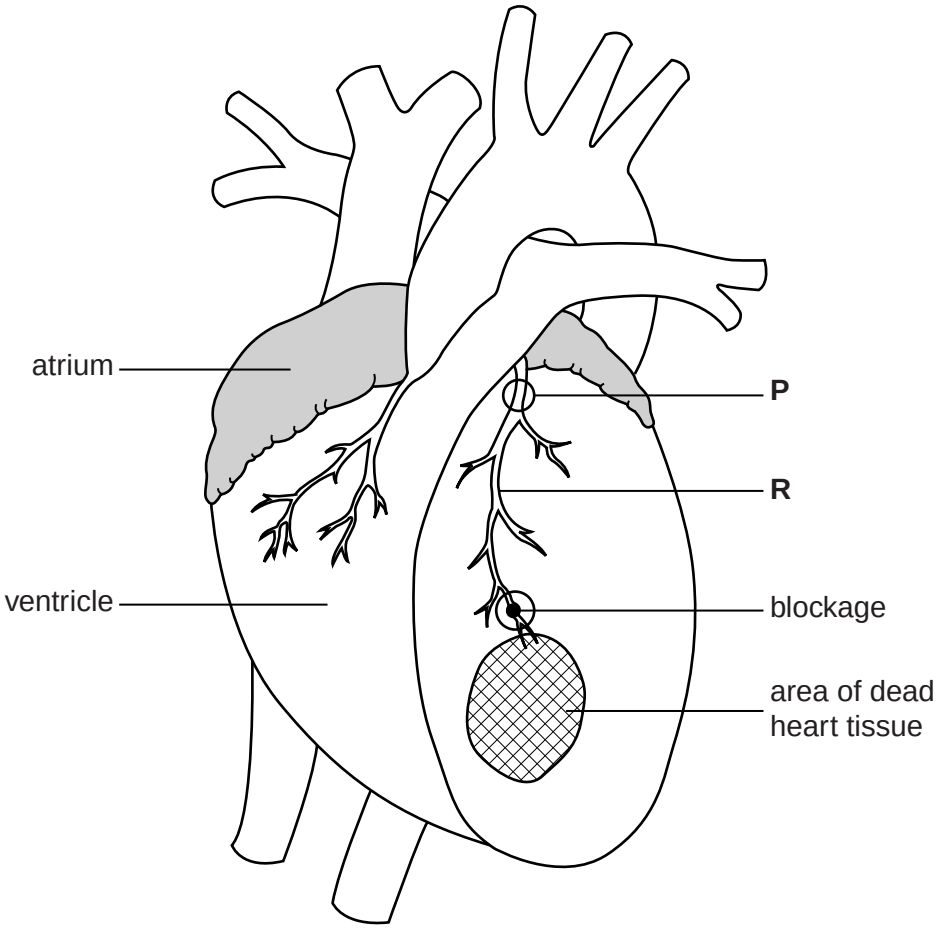


Fig. 3.2

(i) Name the blood vessel labelled **R**, shown on Fig. 3.2.

.....[1]

(ii) Name **one** substance which could block blood vessel **R**.

.....[1]

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(iii) Explain why a blockage at point **P** on Fig. 3.2 is likely to cause a serious, possibly fatal, heart attack.

.....

.....

.....

.....

.....

.....

.....[3]

[Total: 15]

4 **(a)** The boxes on the left contain some genetic terms and the boxes on the right contain definitions of these genetic terms.

Draw **one** straight line to join each term with its correct definition. Draw only six lines.

term	definition
genotype	having two different alleles of the same gene
dominant	the physical features of an organism
heterozygous	the genetic make-up of an organism
phenotype	an allele that is expressed in a heterozygote
haploid	a length of DNA which codes for a specific protein
gene	containing a single set of unpaired chromosomes

[5]

(b) **(i)** Define the term *mitosis*.

.....

.....

.....[1]

(ii) One role of mitosis is to repair damaged tissues.

State **two** other examples of when mitosis occurs.

1 .....

2 .....

[2]

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(c) The number of human male and female babies born is approximately equal.

Fig. 4.1 is an incomplete diagram to show the inheritance of the sex chromosomes in humans.

(i) Complete Fig. 4.1 by filling in the sex chromosomes of the gametes and children. [2]

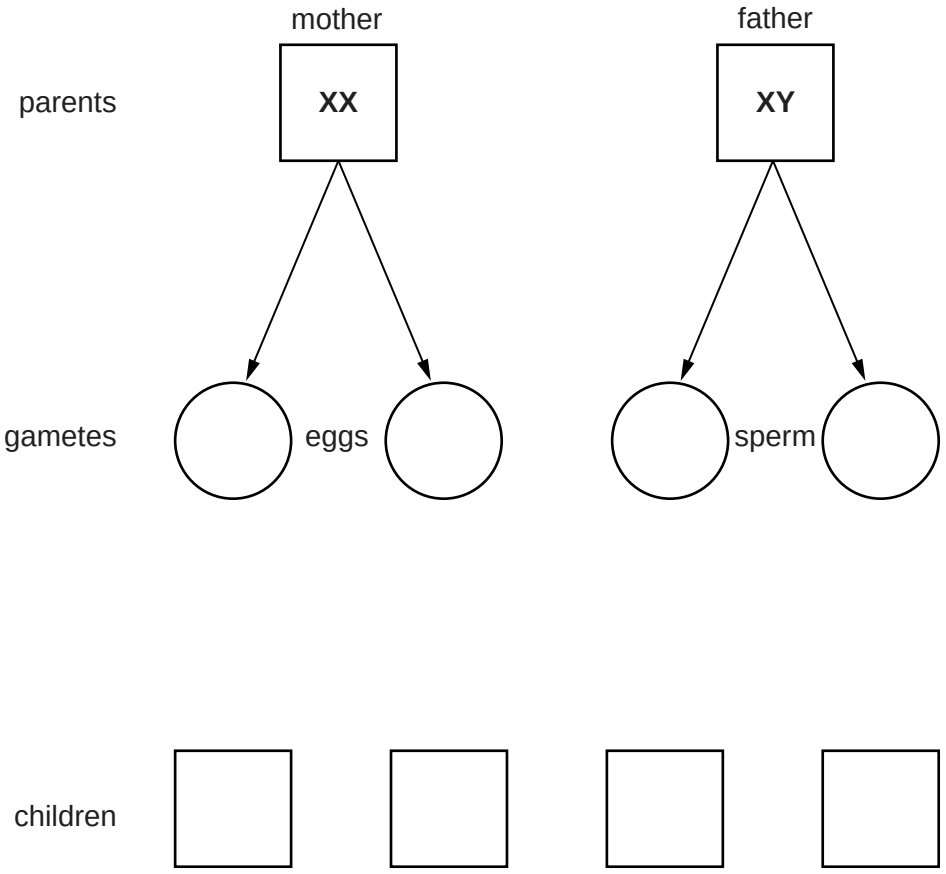


Fig. 4.1

(ii) The couple in Fig. 4.1 are expecting another child.

State the probability (chance) that it will be a boy.

..... [1]

(iii) Write a letter **M** on Fig. 4.1 to show where meiosis occurs. [1]

[Total: 12]

5 Fig. 5.1 shows the internal structure of a tooth.

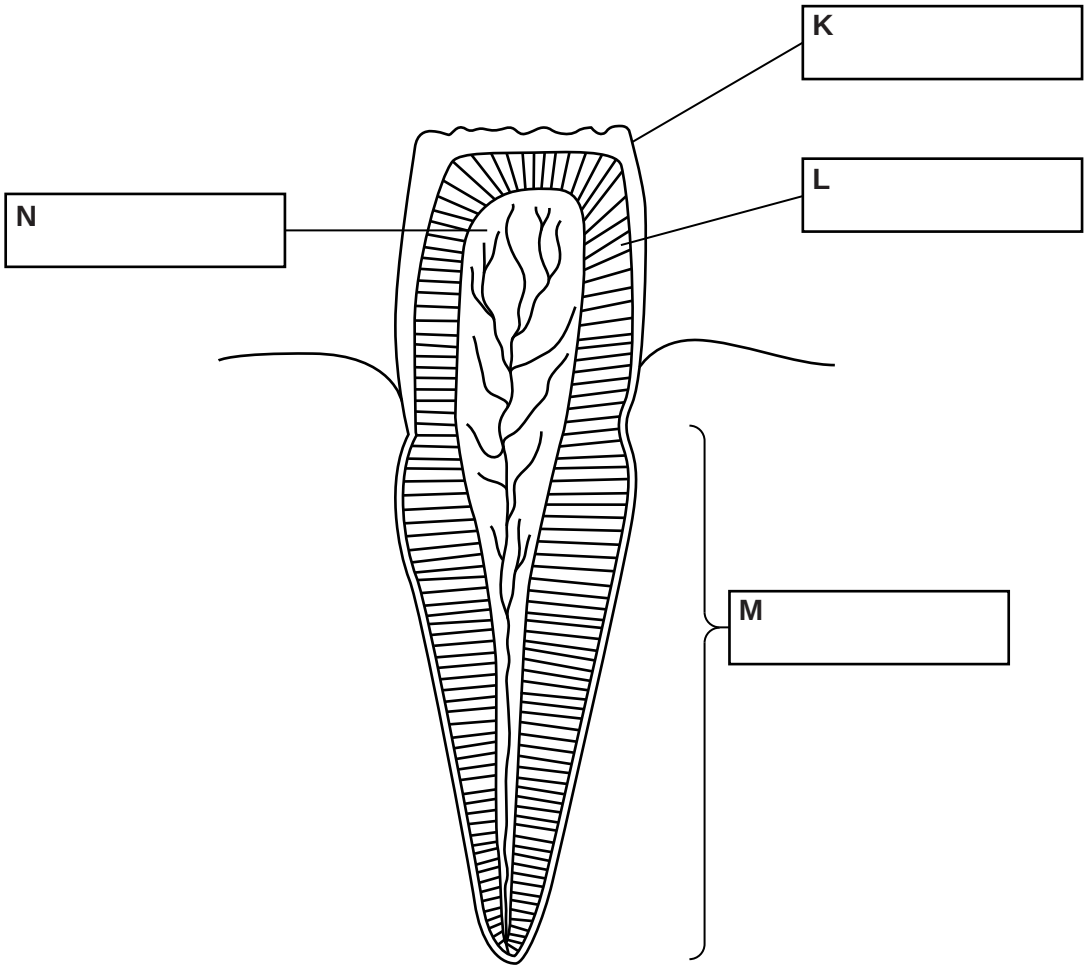


Fig. 5.1

(a) (i) Name the type of tooth shown in Fig. 5.1.

.....[1]

(ii) Name the parts of the tooth labelled **K**, **L**, **M** and **N**.

Write your answers in the boxes on Fig. 5.1. [4]

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(b) Describe how dental (tooth) decay is caused.

.....

.....

.....

.....

.....

.....

.....[3]

[Total: 8]

6 **(a)** Fig. 6.1 is a graph which shows the growth of different parts of the human body.

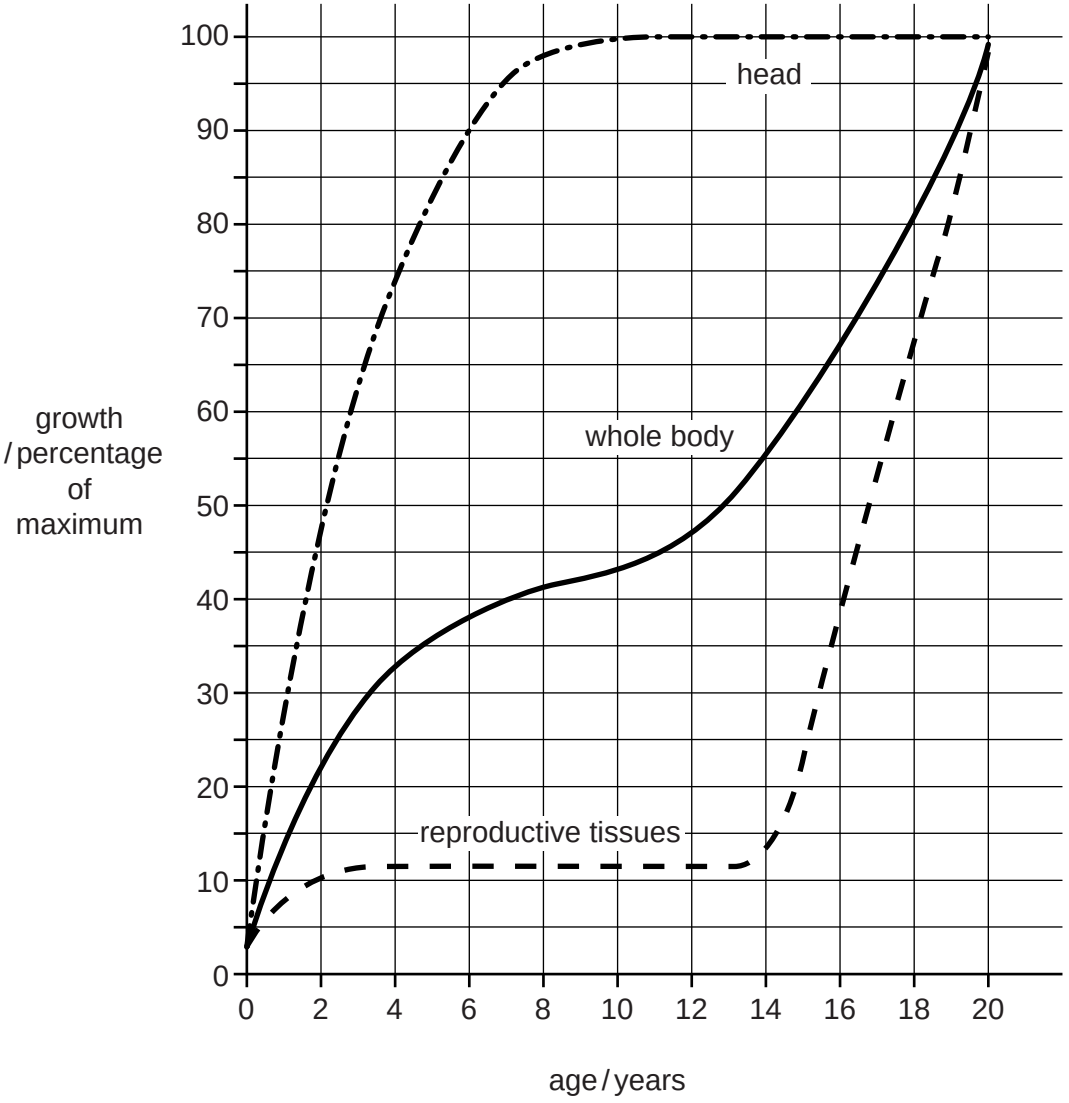


Fig. 6.1

Use information from Fig. 6.1 to:

(i) state the age at which the head reaches full size

.....years [1]

(ii) give **two** age ranges during which the growth rate of the whole body is very rapid

from ..... to .....

from ..... to ..... [2]

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(iii) describe **and** explain the change in the growth of the reproductive tissues between 14 and 20 years of age.

.....

.....

.....

.....

.....

.....

.....[3]

(b) The development of the fetus can be affected by a pregnant woman's lifestyle.

(i) State a possible effect on the fetus of a shortage of calcium in the mother's diet.

.....[1]

(ii) State a possible effect on the newborn baby if the mother smokes during pregnancy.

.....[1]

[Total: 8]

7 **(a)** Fig. 7.1 shows part of the carbon cycle. The boxes represent processes within this cycle.

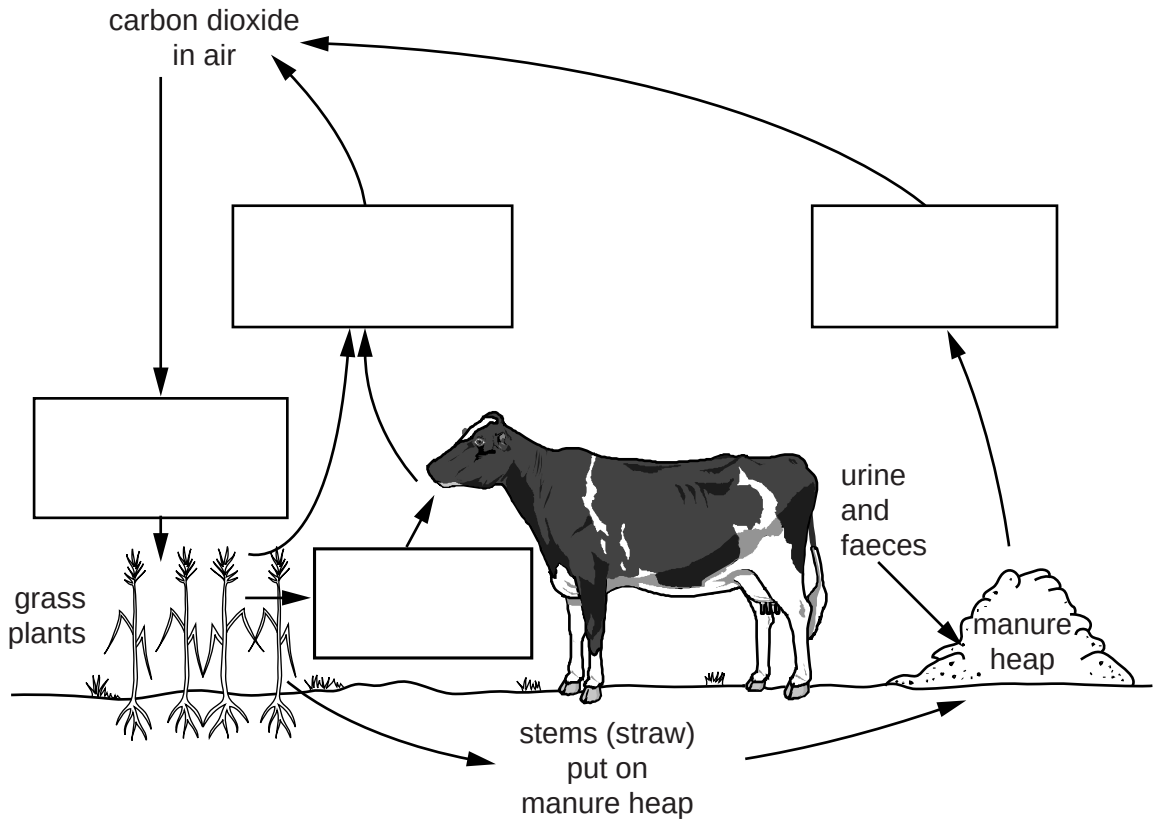


Fig. 7.1

(i) Complete the carbon cycle shown in Fig. 7.1 by choosing processes from this list.

Write the name of a process in each of the boxes on Fig. 7.1. You may use each word once, more than once or not at all.

combustion **deamination** **decomposition** **denaturation**

egestion **feeding** **photosynthesis** **respiration** [4]

(ii) Write the **word** equation for aerobic respiration.

.....[2]

(iii) Manure is a source of natural fertiliser which can be used to improve the growth of crops.

Explain **one** way that the overuse of fertilisers can be harmful to the environment.

.....

.....

.....

.....

.....

.....

.....

.....

.....[4]

(b) In some parts of the world there is not enough food to feed all of the human population.

Farmers sometimes cut down forests to provide more land for growing crops or keeping cattle. This process is called deforestation.

Explain how deforestation can be harmful to the environment.

.....

.....

.....

.....

.....

.....

.....[3]

(c) There can be a shortage of water in highly-developed countries where water use is very high.

Fig. 7.2 shows the water use in one country in Europe.



Fig. 7.2

(i) Calculate the percentage of water used in irrigation **and** animal farming.

Show your working.

..... %
[2]

(ii) Some water is used to flush waste from domestic toilets.

Give **one** reason why this waste water must be treated before it can be re-used.

.....[1]

(iii) Boiling foods in water can reduce their nutrient level by removing vitamins.

Name the vitamin which is needed to prevent the disease scurvy.

.....[1]

[Total: 17]

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8 Fig. 8.1 shows a structure found in the wall of the small intestine.

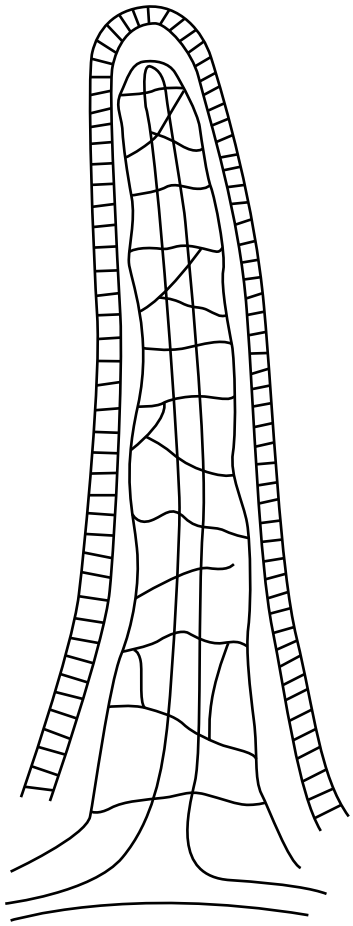


Fig. 8.1

(a) (i) Name the structure shown in Fig. 8.1.

.....[1]

(ii) State **one** function of this structure.

.....

.....[1]

(b) Table 8.1 contains information about the digestion of the three main types of food.

Fill in the spaces to complete Table 8.1.

Table 8.1

food type	enzyme involved in digestion	products of digestion
starch		simple sugar
fat		
protein	protease	

[4]

(c) The products of protein digestion are carried away to the liver.

State **two** ways in which the liver may deal with these products of protein digestion.

1 .....

.....

2 .....

.....

[2]

[Total: 8]

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