



Answer ALL questions.

1 For each of the questions (a) to (j), choose an answer **A**, **B**, **C** or **D** and put a cross in the box . Mark only one answer for each question. If you change your mind about an answer, put a line through the box and then mark your new answer with a cross .

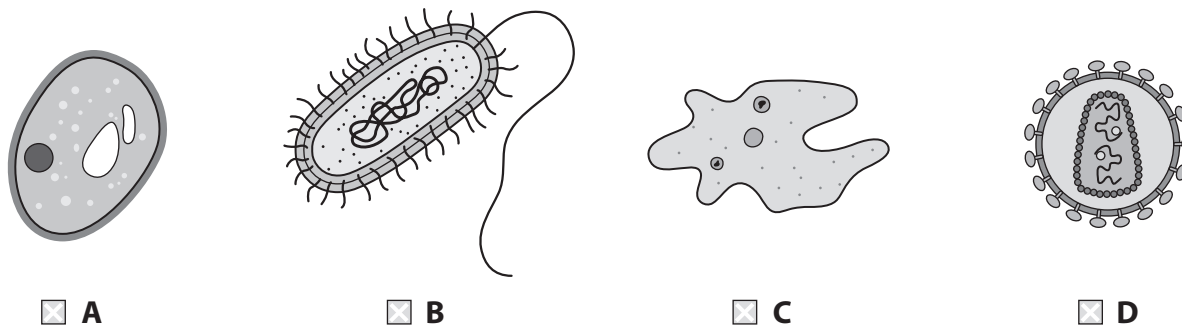
(a) Which organ provides the site for gas exchange between a pregnant woman and her growing fetus?

(1)

- A** placenta
 B umbilical cord
 C uterus
 D cervix

(b) Which diagram shows a bacterial cell?

(1)



(c) Which hormones can be found in the contraceptive pill?

(1)

- A** oestrogen and FSH
 B FSH and progesterone
 C progesterone and oestrogen
 D LH and oestrogen

(d) Which gas is the main cause of acid rain?

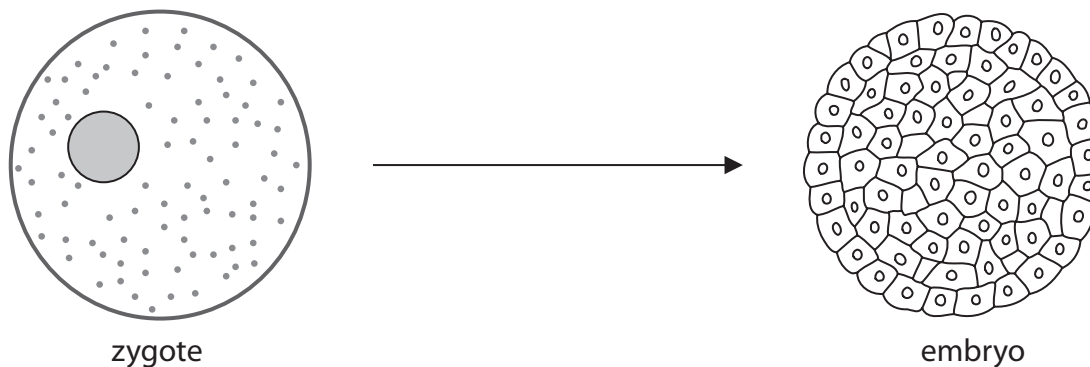
(1)

- A** carbon monoxide
 B chlorofluorocarbons (CFCs)
 C sulphur dioxide
 D methane



(e) Which word describes the process shown in the diagram?

(1)



- A** fertilisation
- B** mitosis
- C** inheritance
- D** meiosis

(f) Bacteria are destroyed by drugs known as

(1)

- A** antibodies
- B** antibiotics
- C** antigens
- D** vaccines

(g) What name is given to the genetic make-up of an individual?

(1)

- A** recessive
- B** phenotype
- C** codominance
- D** genotype

(h) The name of the blood vessel that delivers blood to the kidneys is the

(1)

- A** hepatic vein
- B** hepatic artery
- C** renal vein
- D** renal artery





- (i) Which row of the table describes the action of the intercostal muscles and the diaphragm when breathing out?

(1)

| | Intercostal muscles | Diaphragm |
|-----------------------------------|---------------------|-----------|
| <input type="checkbox"/> A | contract | relaxes |
| <input type="checkbox"/> B | relax | relaxes |
| <input type="checkbox"/> C | contract | contracts |
| <input type="checkbox"/> D | relax | contracts |

- (j) Anaerobic respiration is different from aerobic respiration because it

(1)

- A** releases energy
- B** requires oxygen
- C** uses glucose
- D** produces lactic acid

(Total for Question 1 = 10 marks)

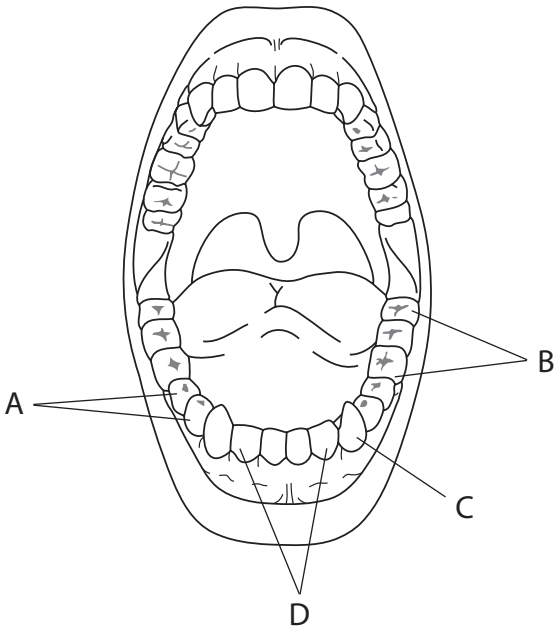


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2 The diagram shows the arrangement of teeth in the mouth of an adult.



(a) (i) Which of the teeth are designed to grip and tear food? (1)

- A
- B
- C
- D

(ii) Describe how teeth A and B help with the digestion of food in the mouth. (4)

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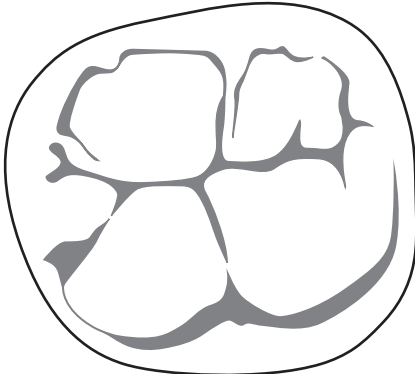
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(b) The diagram shows the top surface of a tooth found at the back of the mouth.



Suggest why teeth of this type are more likely to decay than other teeth.

(4)

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(c) Name a mineral ion needed to maintain strong, healthy teeth.

(1)

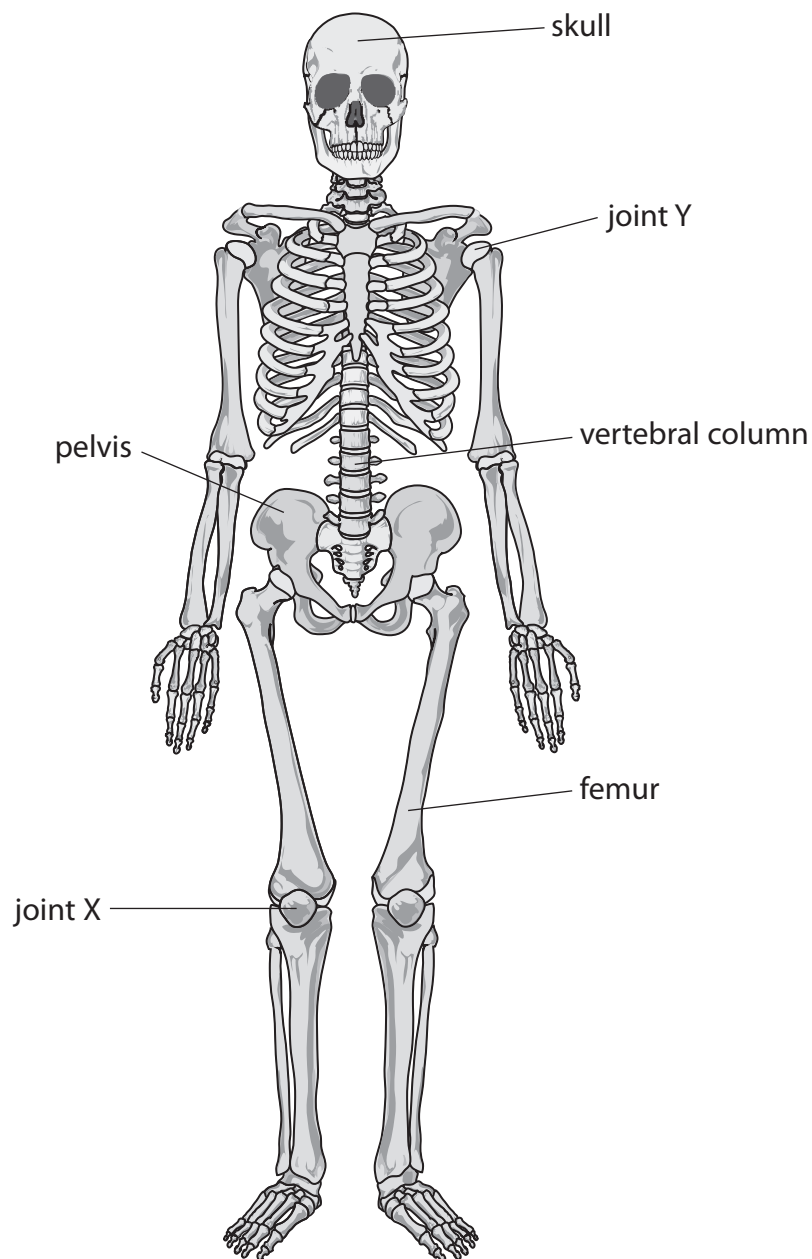
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(Total for Question 2 = 10 marks)





3 (a) The diagram shows a human skeleton.



(i) Name the type of joint shown by joint X in the diagram.

(1)



(ii) Explain how the structure of joint Y allows it to bring about movement.

(4)

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(iii) Place one tick (✓) in each row to show whether the structures form part of the axial or appendicular skeleton.

(3)

| Structure | Axial skeleton | Appendicular skeleton |
|------------------|----------------|-----------------------|
| vertebral column | | |
| femur | | |
| skull | | |
| pelvis | | |





(b) The passage describes the role of bones and muscles in movement.
Use words from the box to complete the passage.
You may use each word once, more than once or not at all.

(7)

| | | | | |
|--------------|-----------|--------------|-----------|-----------|
| involuntary | relaxes | mitochondria | contracts | |
| antagonistic | pushed | ligaments | pulled | ribosomes |
| muscles | voluntary | tendons | | |

Bones are moved by muscles. These muscles are

attached to bones by and they work

in pairs. When one muscle in the

pair the other

and bones are in a particular direction. Muscle cells

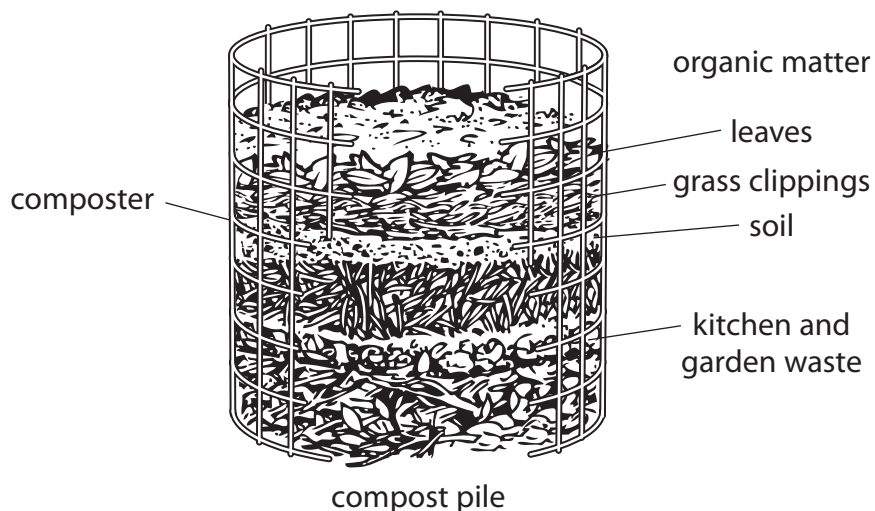
contain many which release energy for movement.

(Total for Question 3 = 15 marks)





5 Gardeners use compost to fertilise their soil.
The diagram shows a composter, where organic matter is broken down by aerobic bacteria to produce compost.



(a) (i) The bacteria that break down organic matter are non-pathogenic.

Non-pathogenic bacteria

(1)

- A do not cause disease
- B cause disease
- C prevent disease
- D cure disease

(ii) Explain why bacteria break down organic matter more quickly in summer than in winter.

(2)

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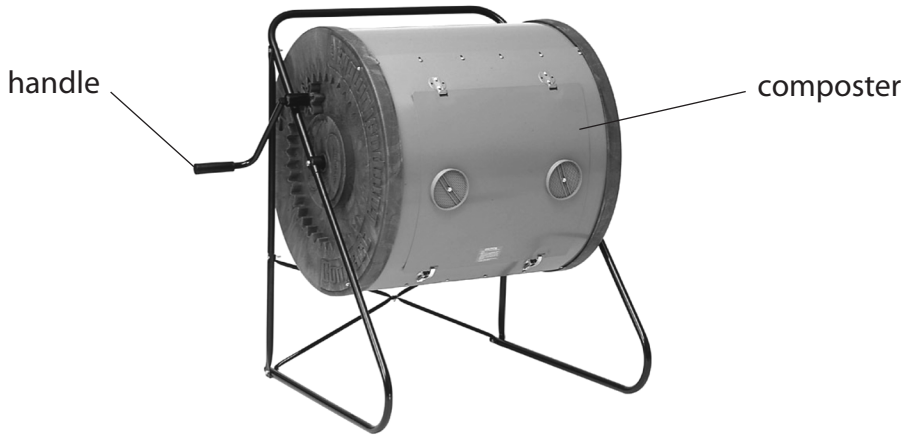
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(iii) This diagram shows a different type of composter. Every few days the gardener turns the handle to rotate the composter.



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Suggest why rotating the composter helps to break down the organic matter more quickly.

(3)

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(iv) Once the organic matter in a composter has been broken down by the bacteria, the fertiliser produced can be spread over the soil.

Suggest why fertiliser is useful to gardeners.

(2)

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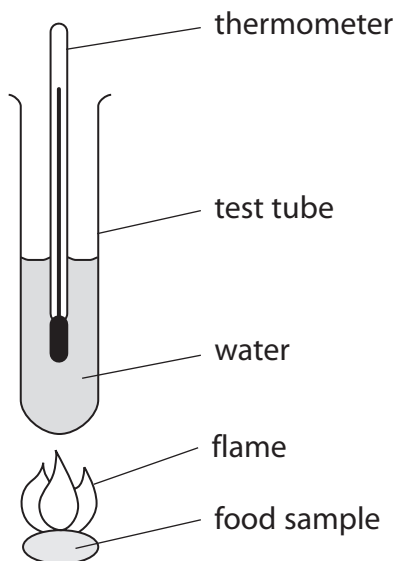
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6 This apparatus is used to investigate the amount of energy available in food.



(a) (i) Describe how the apparatus can be used to investigate the energy available in different foods.

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(ii) A student uses this apparatus to compare the amount of energy available in two different foods.

What variable should she control to obtain valid results?

(1)

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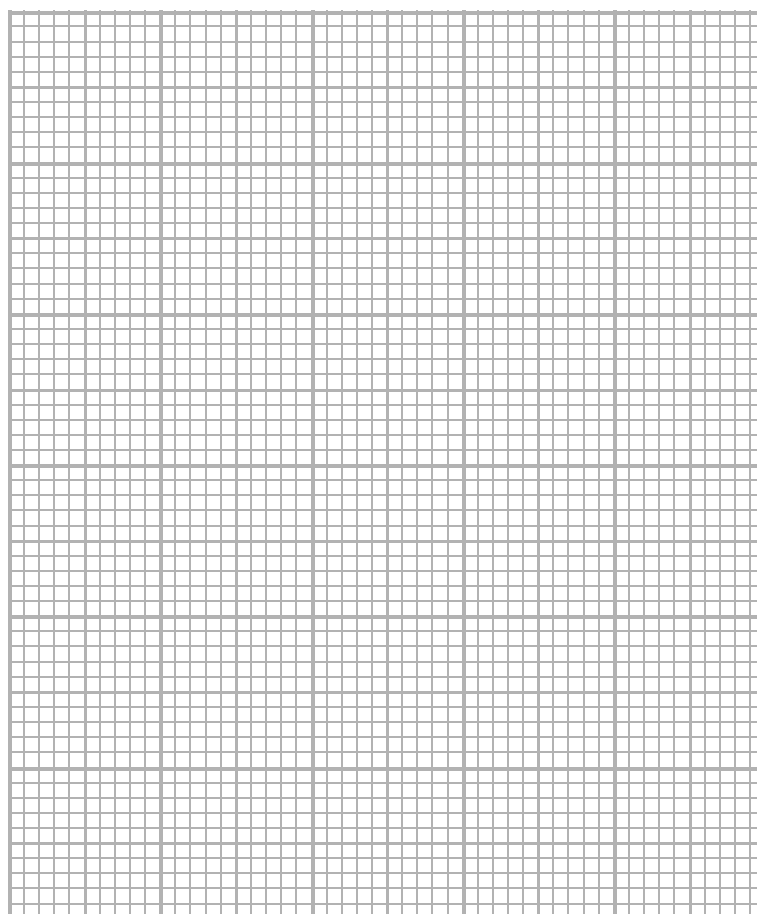
(b) The amount of energy available is measured in kilojoules (kJ).

The table shows the amount of energy available per 10 g of different foods.

| Food type | Energy available per 10 grams of food (kJ) |
|-----------|--|
| broccoli | 10 |
| orange | 25 |
| bread | 50 |
| chicken | 120 |
| butter | 300 |

(i) Draw a bar graph to display the data from the table.

(5)



(ii) Suggest three reasons for the variation in the amount of energy available in the different foods.

(3)

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(c) Explain why the average daily energy requirement for teenage males is different from the requirement for males over 60 years of age.

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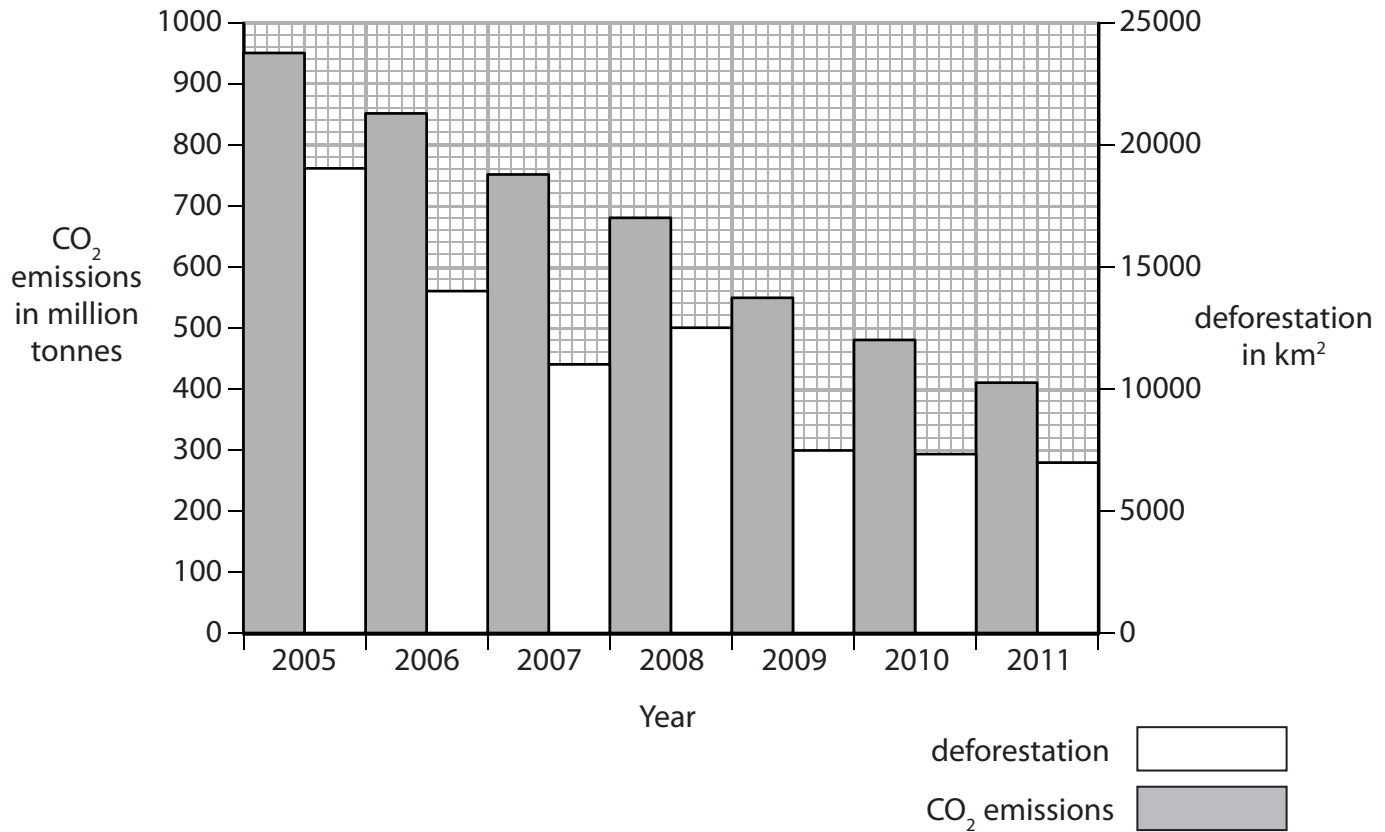
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(Total for Question 6 = 15 marks)



7 (a) The bar graph shows the levels of deforestation and carbon dioxide (CO₂) emissions each year in the Brazilian Amazon between 2005 and 2011.



(i) Calculate the difference in the level of deforestation in 2011 compared with the level in 2005.

(2)

difference = km²

(ii) Use the bar graph to compare the trends in deforestation and CO₂ emissions between 2005 and 2011.

(2)

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(b) (i) Describe how deforestation can lead to a greater imbalance of oxygen and carbon dioxide in the atmosphere.

(2)

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(ii) Describe how deforestation leads to soil erosion.

(3)

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(c) Excess carbon dioxide in the atmosphere can lead to global warming.
Describe the consequences of global warming.

(3)

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(d) Eutrophication is another environmental problem.

Describe how eutrophication might occur in some lakes.

(2)

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(Total for Question 7 = 14 marks)

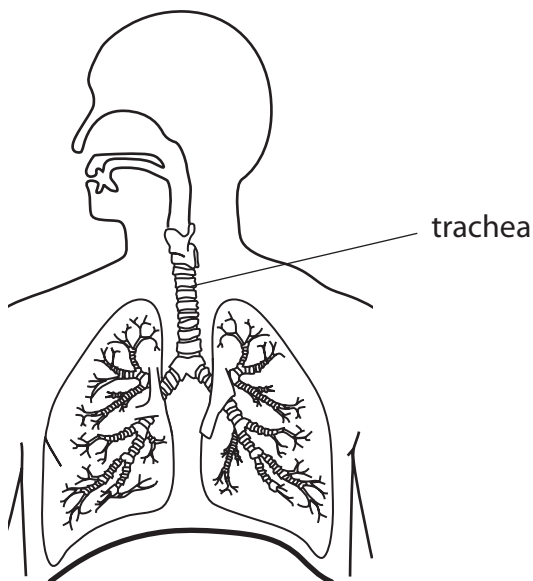


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8 The diagram shows the human respiratory system.



(a) Ciliated cells are found in the trachea.

(i) Draw a diagram of a ciliated cell.

Label the cilia, the cell membrane and the nucleus.

(4)

(ii) The smoke from cigarettes can prevent the normal functioning of cilia. Explain the effect that this could have on the health of a person who smokes cigarettes.

(3)

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(b) (i) Cigarette smoke contains substances that are harmful to the body.

Draw a straight line from each substance to its harmful effect on the body.

(2)

Substance

Effect on the body

tar

nicotine

slows down responses

raises blood pressure

prevents gas exchange

decreases heart rate

causes lung cancer

(ii) Explain why the birth weight of babies born to mothers who smoke tends to be lower than those born to mothers who are non-smokers.

(3)

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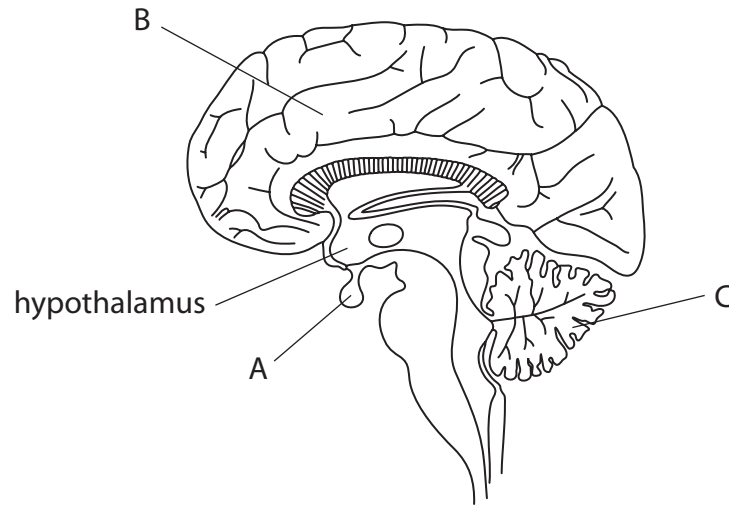
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(Total for Question 8 = 12 marks)





9 The diagram shows a side-view of the human brain.



(a) (i) Name the parts of the brain labelled A, B and C.

(3)

A.....

B.....

C.....

(ii) Which of these parts link the senses with the muscles that cause voluntary movement?

(1)

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(c) Describe the role of the hypothalamus in controlling body temperature.

(3)

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(Total for Question 9 = 14 marks)

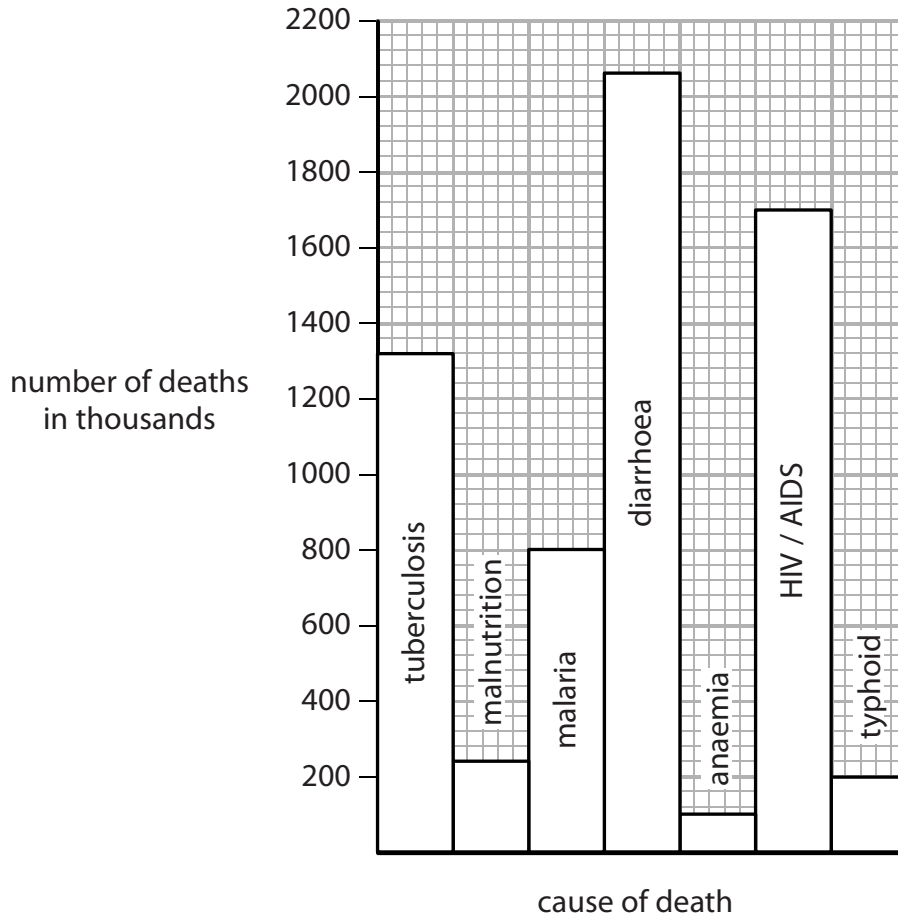


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10 Nutritional diseases are caused by an inadequate diet and communicable diseases are those that can be transmitted from one person to another.

The bar graph shows the number of people, in thousands, that died from certain nutritional and communicable diseases in 2008.



(a) In 2008, an estimated 15.6 million people died from all nutritional and communicable diseases.

Calculate the percentage of these deaths that were caused by malaria.

(3)

percentage =%



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