



# **KS3 Science**

## **Disease**

### **Question Paper**

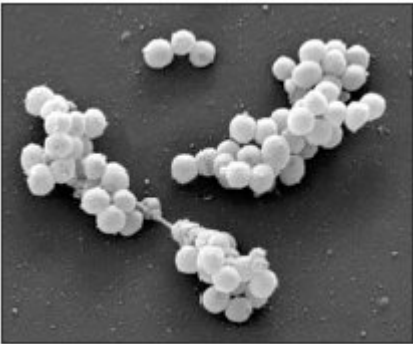
**Time available: 44 minutes**

**Marks available: 59 marks**

**[www.accesstuition.com](http://www.accesstuition.com)**

1.

The photograph below shows bacteria that have developed resistance to antibiotics. They are called MRSA bacteria.



(a) When MRSA bacteria reproduce, they pass on their resistance to antibiotics to the next generation.

What part of a cell passes on information?

.....

1 mark

(b) MRSA bacteria can cause serious infections in people who are ill in hospital. The bacteria can live on a healthy person's **skin** or in their **lungs** without causing any harm.

Use this information to fill in the table below.  
Suggest **two** ways MRSA bacteria can be spread from person to person.  
Suggest how the spread of the bacteria can be prevented for each method.

	method of spread	method of prevention
1		
2		

2 marks

(c) People can be vaccinated against some diseases caused by bacteria or viruses.

Describe how vaccination prevents a person getting a disease.

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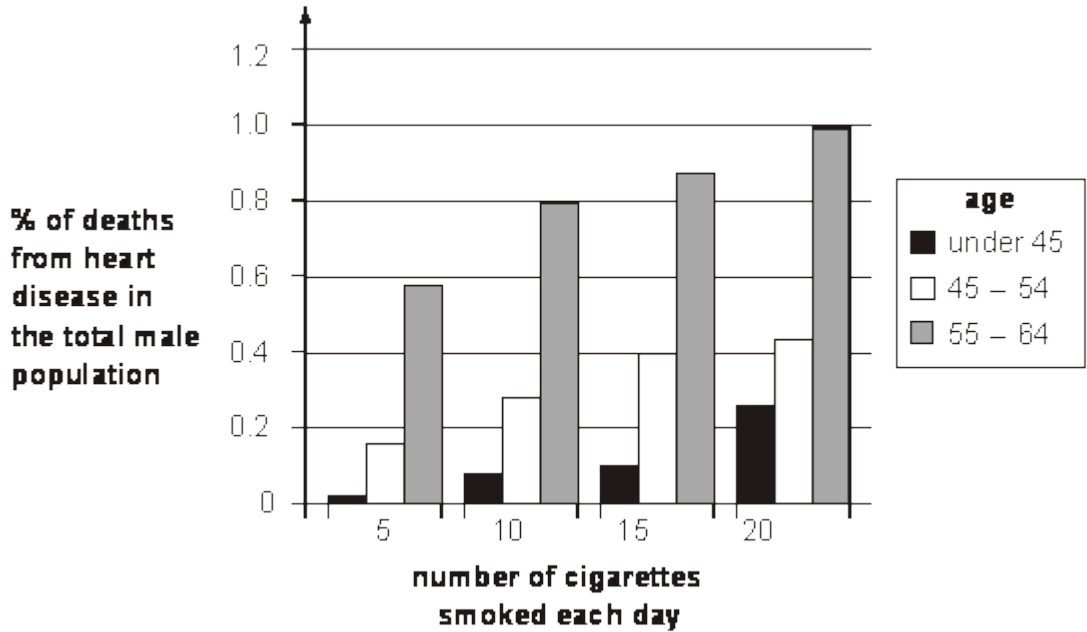
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3 marks  
maximum 6 marks

2.

The bar chart below shows how the number of cigarettes smoked is linked to the percentage of deaths from heart disease in the total male population.



(a) Use the information in the bar chart to write **two** conclusions about the relationship between smoking and the number of male deaths from heart disease.

1. ....

.....

2. ....

.....

2 marks

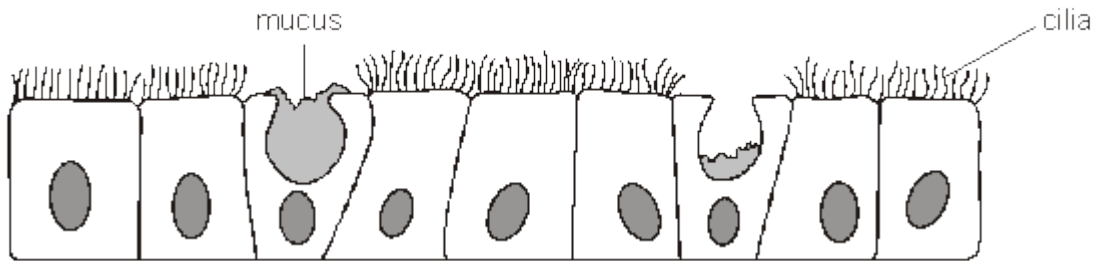
(b) Smoking can cause fat to be deposited in the arteries to the heart muscle.

Explain how this could prevent the heart muscle from working properly.

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.....  
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.....

3 marks

(c) The drawing below shows part of the lining of the airway leading into the lungs.



(i) Describe how mucus and cilia help to keep the airway free of dust and bacteria.

mucus .....

.....

cilia .....

.....

2 marks

(ii) Cigarette smoke contains tar.

What effect does tar have on the cilia?

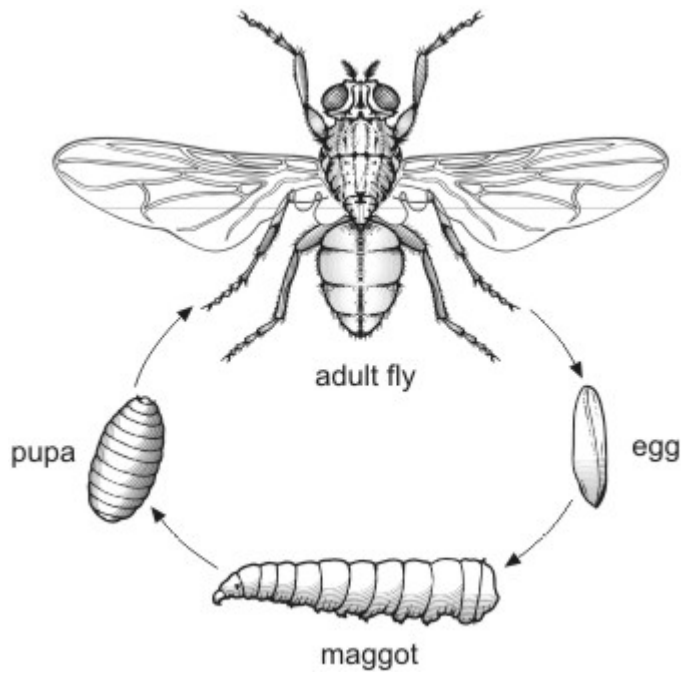
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1 mark  
maximum 8 marks

3.

The life cycle of the housefly is shown below.



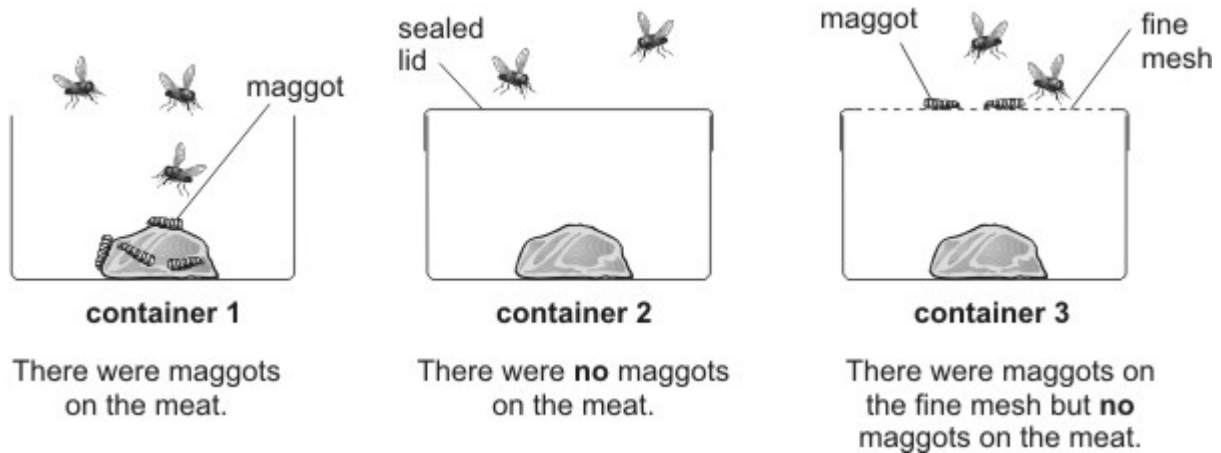
*not to scale*

Before the seventeenth century, people believed that maggots found on rotting meat came either from the meat **or** from the air and **not** from eggs of the housefly.

In 1668, a doctor named Francesco Redi placed some meat into three separate containers:

- container 1, left open to the air
- container 2, sealed with a lid
- container 3, covered with a fine mesh.

He left the containers for several days in a room containing adult houseflies. His results are shown below.



(a) Look at the drawings and read the sentences beneath them.

(i) How do Redi's results show that maggots do **not** come from rotting meat?

.....  
.....

1 mark

(ii) How do Redi's results show that maggots do **not** come from the air?

.....  
.....

1 mark

(b) The maggots that hatched on the meat in container 1 could complete their life cycle.

Explain why the maggots that hatched on the mesh on container 3 could **not** complete their life cycle.

.....  
.....

1 mark

(c) Give **two** reasons why meat should be kept in a refrigerator.

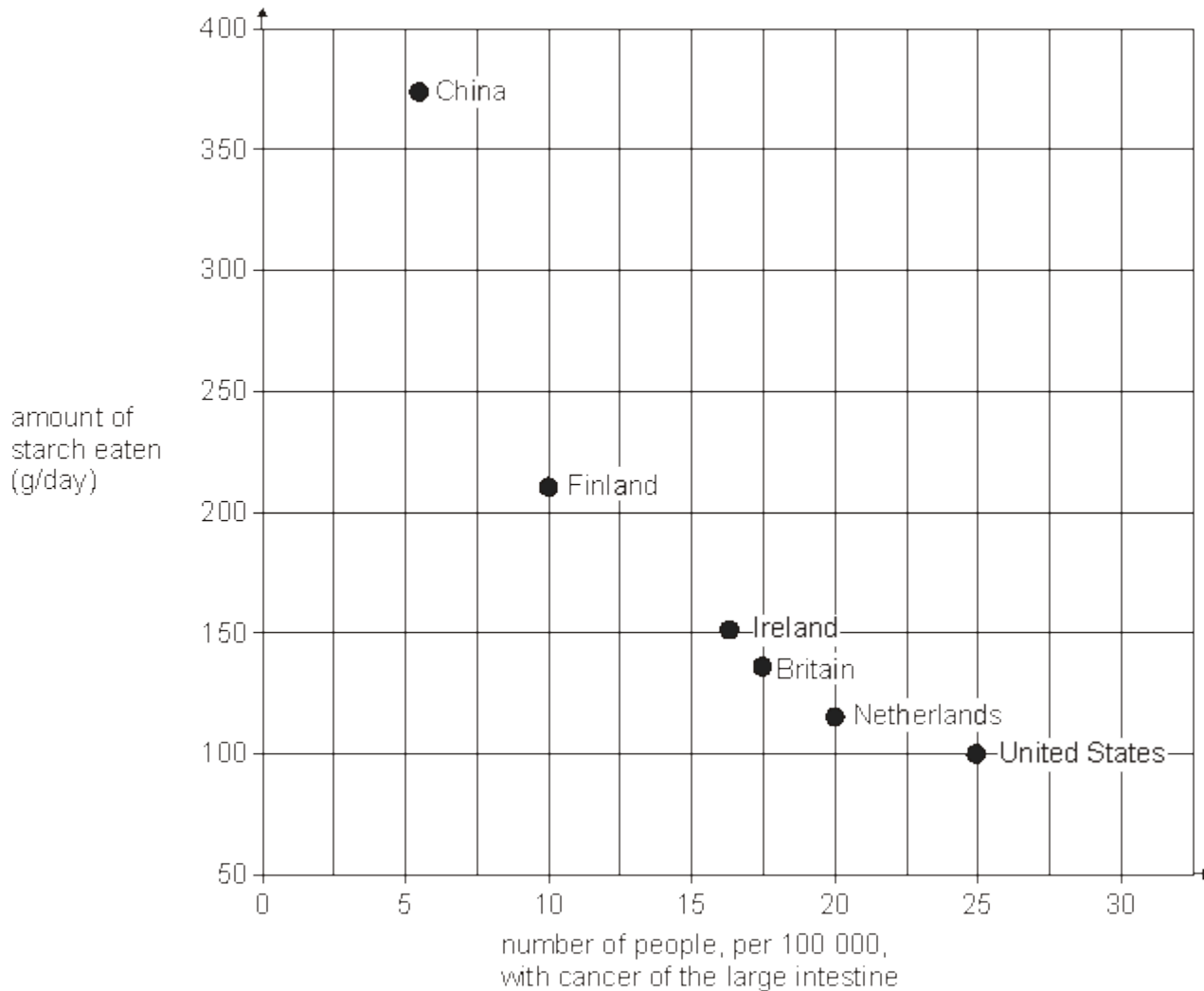
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2 marks  
maximum 5 marks

4.

People in different countries eat different amounts of starch. A scientist compared the amount of starch that people ate with the number of people with cancer of the large intestine.

The scatter graph below shows her results.



Look at the scatter graph.

(a) (i) Which country had the greatest proportion of people with cancer of the large intestine?

.....

1 mark

(ii) What conclusion could you come to about the effect of eating starch on getting cancer of the large intestine?

.....  
.....

1 mark

(b) (i) Starch is a carbohydrate.

Which **two** of the following foods are good sources of starch?  
Tick the **two** correct boxes.

bread	<input type="checkbox"/>	cheese	<input type="checkbox"/>
chicken	<input type="checkbox"/>	tomatoes	<input type="checkbox"/>
fish	<input type="checkbox"/>	pasta	<input type="checkbox"/>

2 marks

(ii) What other type of nutrient, needed as part of a balanced diet, keeps the intestine working well and prevents constipation?  
Tick the correct box.

fat	fibre	minerals	protein	vitamins
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 mark  
maximum 5 marks

5.

(a) Carbon monoxide, nicotine and tar get into the lungs when a person smokes.

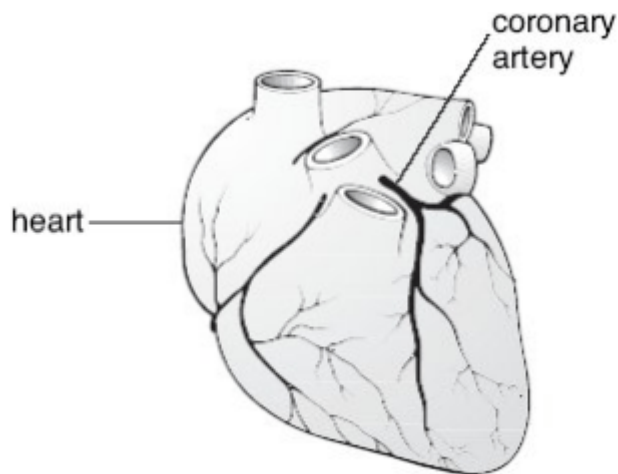
Draw a line from each substance to the effect of the substance on the body.  
Draw only **three** lines.

substance	effect of the substance
<input type="text" value="carbon monoxide"/>	<input type="text" value="causes addiction to smoking"/>
<input type="text" value="nicotine"/>	<input type="text" value="causes influenza (flu)"/>
<input type="text" value="tar"/>	<input type="text" value="causes lung cancer"/>
	<input type="text" value="causes red blood cells to carry less oxygen"/>

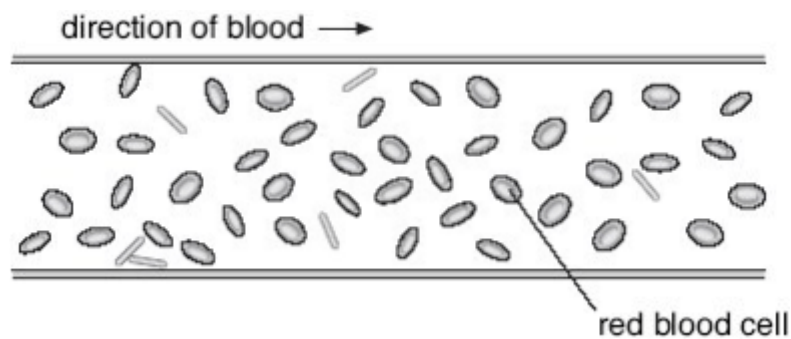
3 marks



- (b) The coronary arteries carry blood to the heart muscle.  
The drawing below shows the heart and coronary arteries.

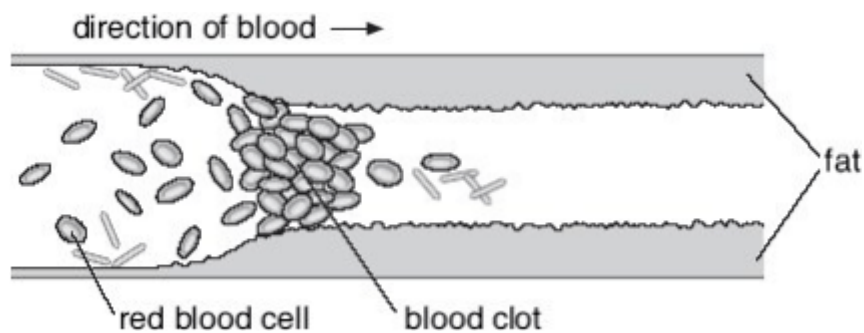


- (i) Diagram 1 shows a section through a coronary artery.



**diagram 1**

Smoking can cause damage to the coronary artery.  
Diagram 2 shows a section through part of a damaged artery.



**diagram 2**

*not to scale*

Look at diagram 2. A blood clot has formed.

Give **one** other change in the coronary artery.

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.....

1 mark

(ii) Respiration takes place in the muscle cells of the heart.

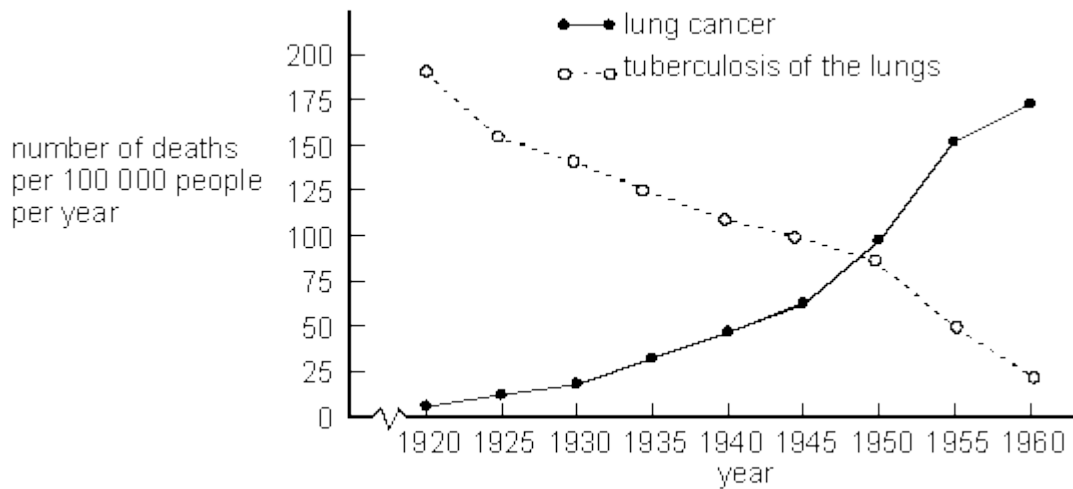
Explain why a blood clot in the coronary artery prevents these cells respiring normally.

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.....  
.....

2 marks  
maximum 6 marks

6.

(a) The graphs show the number of deaths from lung cancer and from tuberculosis of the lungs, in England and Wales, between 1920 and 1960.



(Data obtained from Key Science Biology, Applin; published by Stanley Thornes 1994)

(i) Between which two dates on the graph did the number of deaths from lung cancer rise fastest?

..... and .....

1 mark

(ii) Lung cancer may be caused by cigarette smoking.

What substance in cigarette smoke causes lung cancer?

.....

1 mark

(b) The number of deaths from tuberculosis of the lungs went down because of better medical treatment and preventive medicine.

What type of treatment is given to young people nowadays to prevent them from getting tuberculosis?

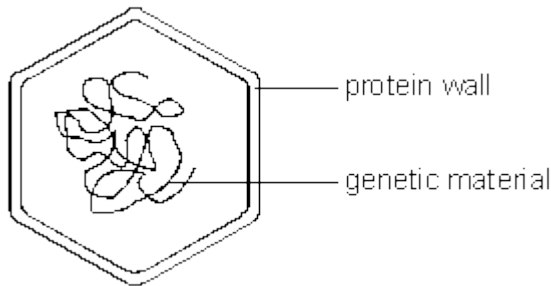
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1 mark  
Maximum 3 marks

**7.**

Viruses have a very simple structure as shown below. They have no nucleus.



Viruses only reproduce inside living cells. Unlike bacteria, viruses are **not** affected by medicines called antibiotics.

(a) Describe how vaccines can help the body's natural defences against viruses.

.....  
.....  
.....

2 marks

(b) Some viruses are able to change their genetic material frequently. Each change produces a virus with different protein molecules in the protein wall. Explain why a vaccine which worked against the old virus may **not** work against the new types.

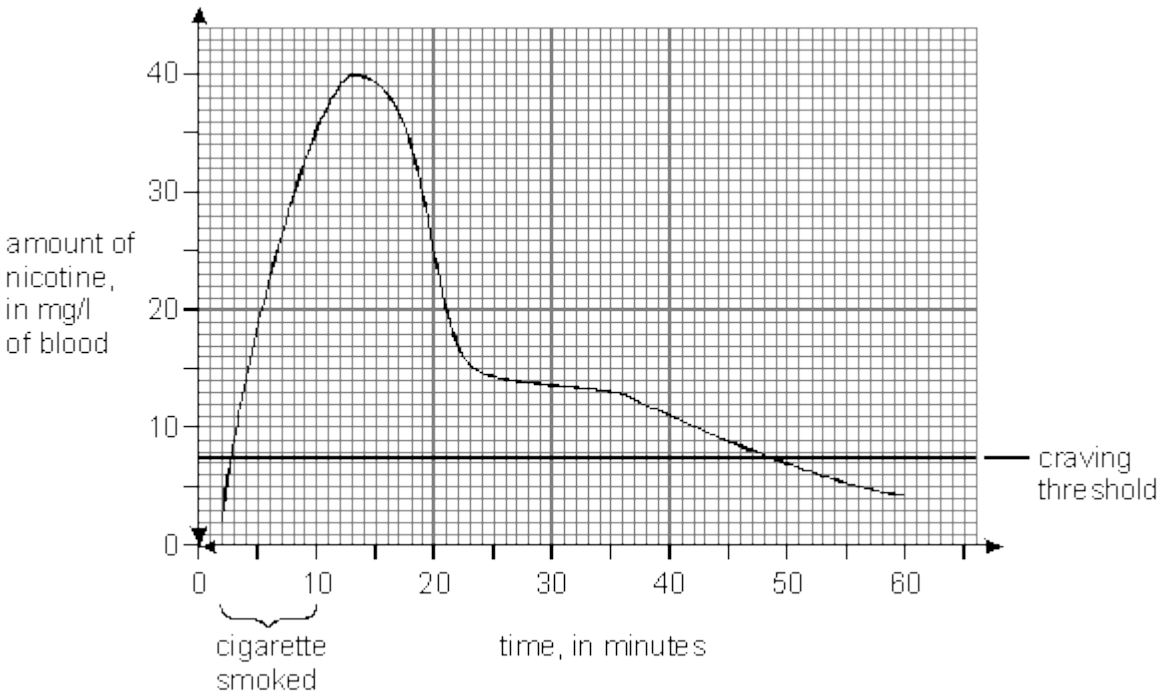
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1 mark  
Maximum 3 marks

8.

Wesley wants to give up smoking but finds it difficult.

- (a) The graph shows the level of nicotine in Wesley's blood after he smokes a cigarette. The craving threshold is the amount of nicotine he needs in his blood to stop him wanting a cigarette.



- (i) Use the graph to calculate how often Wesley needs to smoke a cigarette to keep the nicotine level above the craving threshold.

.....

1 mark

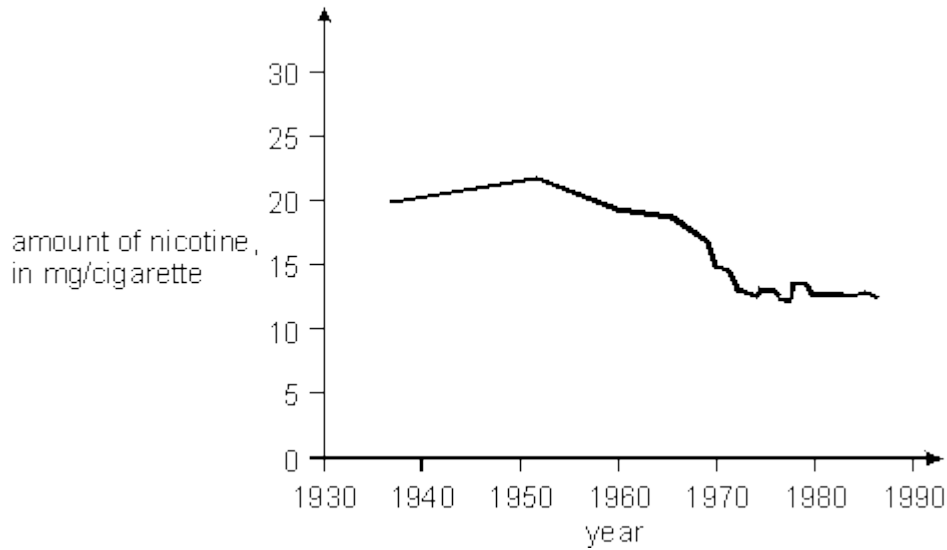
- (ii) Wesley continues to smoke often. His craving threshold goes up. Explain why this happens.

.....

.....

1 mark

- (b) The graph below shows how the amount of nicotine in cigarettes changed between 1930 and 1990.



Predict **one** consequence of reducing the amount of nicotine in cigarettes  
Give the reason for your answer.

.....  
.....  
.....  
.....

2 marks

- (c) Cigarette smoke contains carbon monoxide. If a pregnant woman inhales cigarette smoke, some of the red blood cells will combine strongly with carbon monoxide instead of oxygen.

If a pregnant woman smokes, how could this harm the foetus?

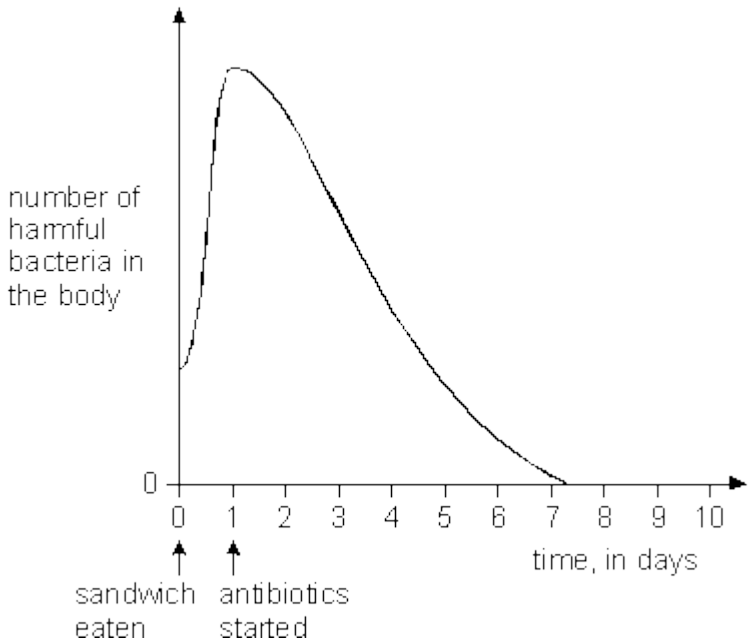
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1 mark  
Maximum 5 marks

9.

One evening Jenny and Leah ate chicken sandwiches which had been in their school bags all day. There were harmful bacteria in the food. The next day both girls became very ill. Their doctor gave them antibiotics to take for eight days.

The graph represents how antibiotics affect the number of bacteria in the body.



(a) Use the graph to explain why the girls did **not** become ill until the day after eating the sandwiches.

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.....

1 mark

(b) After taking the antibiotics for eight days Jenny was completely better. Explain why she got better.

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1 mark

(c) Leah should have taken the antibiotics for eight days. She felt much better after five days and stopped taking the antibiotics. Two days later she felt very ill again. Use the graph to help you explain why Leah became ill again.

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.....  
.....

2 marks

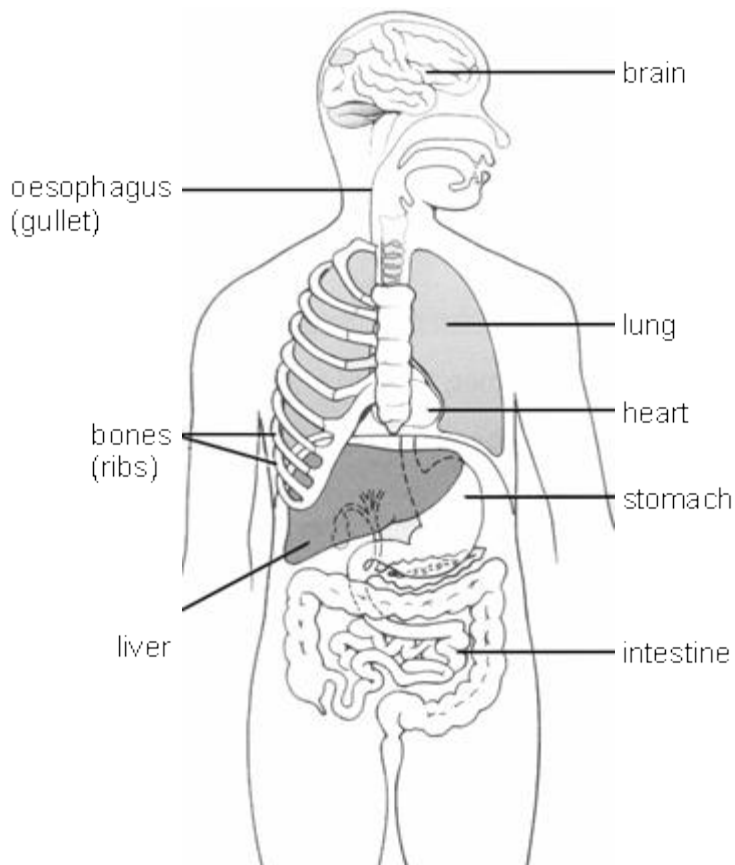
- (d) Food will keep longer if it is placed in a refrigerator at 2°C.  
Refrigeration does **not** kill bacteria.  
What effect does the low temperature have on bacteria?

.....  
.....

1 mark  
Maximum 5 marks

**10.**

The diagram shows some of the organs of the human body.



- (a) Give the names of **two** labelled parts where food is digested.

..... and .....

1 mark

- (b) Why do we need to chew our food and mix it with saliva?

.....  
.....  
.....

2 marks

(c) (i) Draw **one** line from each bad habit to the organ it harms.

<b>bad habit</b>	<b>organ</b>
drinking too much alcohol	liver
<b>not</b> eating enough fibre	lung
smoking cigarettes	ribs
	intestine

3 marks

(ii) Which organ in the list below can be harmed if we eat too much fat?  
Tick the correct box.

brain		heart	
lung		ribs	

1 mark  
Maximum 7 marks

**11.**

Cholera is a disease caused by bacteria. These bacteria produce a poison. The poison prevents the large intestine from absorbing water from the food passing through it. People with cholera can lose more than a litre of water per hour.

(a) Give **one** function of water in the body.

.....  
.....

1 mark



- (b) People can be injected with a vaccine against cholera. The vaccine contains a tiny amount of the cholera poison and **not** the cholera bacteria. As a result, people become immune to cholera.

Describe how vaccination makes a person immune to cholera.

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.....  
.....

2 marks

- (c) The cholera poison makes the skin permeable. A new method of vaccinating against cholera is to put a small amount of the poison, mixed with other vaccines, on a plaster. The plaster is left on the skin for a day. The vaccines pass through the skin and the person becomes immune to cholera and to other diseases.

- (i) Why should only a tiny amount of the poison be used?

.....  
.....

1 mark

- (ii) Suggest **one** advantage of vaccinating people in this way.

.....  
.....

1 mark

Maximum 5 marks