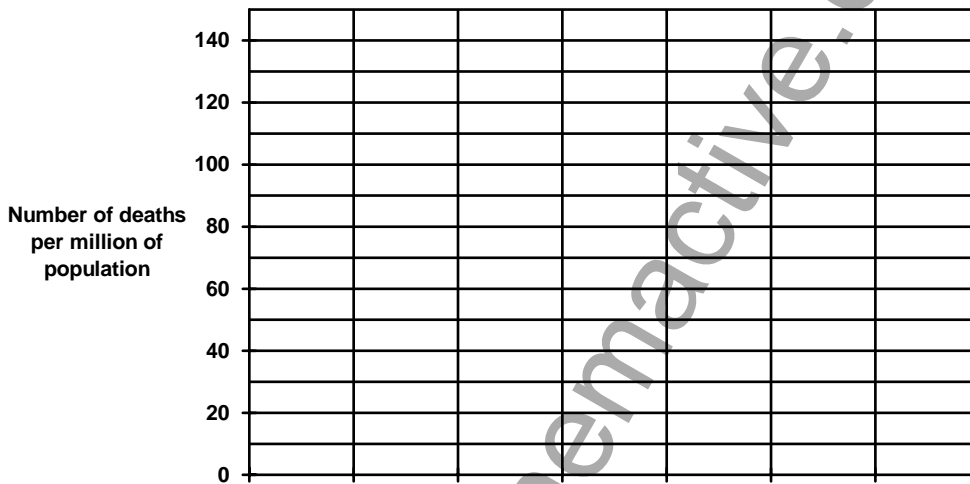


The table shows the number of deaths from lung cancer in 6 different countries.

Country	Number of deaths from lung cancer (per million of the population)
USA	130
England	90
Italy	75
Holland	60
Portugal	45
Spain	80

(a) On the grid, draw a bar chart of these figures.

[3]



(b) In which country would you expect cigarette smoking to be the highest.

..... [1]

(c) The population of Portugal is 35 million.  
Calculate the total number of deaths from lung cancer in Portugal.

.....  
..... [2]

Low Demand Questions

QUESTIONSHEET 2

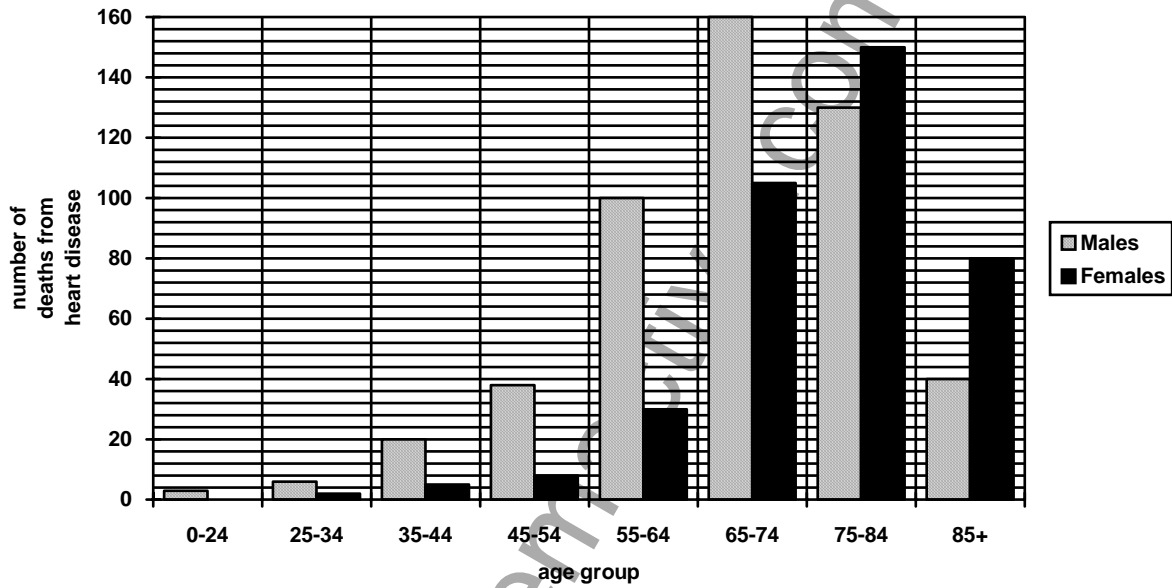
(a) Suggest three ways a person can reduce the risk of heart disease.

.....

.....

..... [3]

The graph shows the number of deaths from heart disease in one town.



(b) (i) How many men aged 55 - 64 died of heart disease?

..... [1]

(ii) How many women aged 65 - 74 died of heart disease?

..... [1]

(iii) What was the total number of deaths from heart disease in the 85+ age group?

..... [1]

(iv) What fraction of the deaths in the 85+ age group were women?

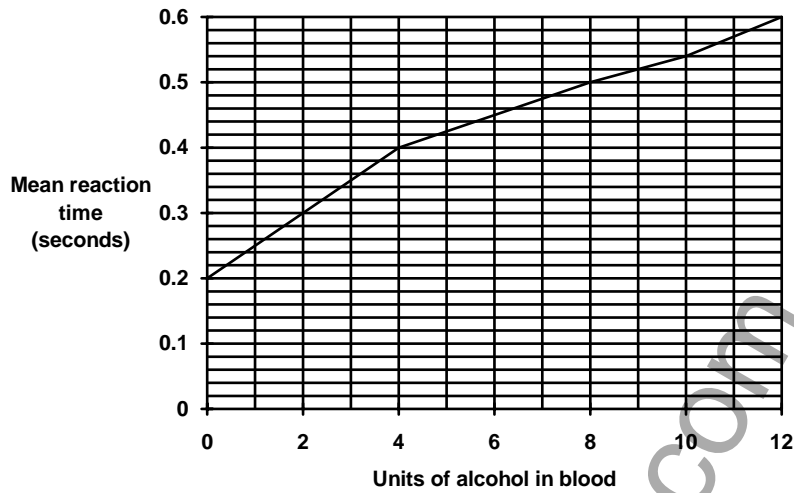
..... [1]

(c) Describe the relationship between age and deaths from heart disease in men.

.....

..... [2]

The graph shows the effect of different amounts of alcohol on the mean reaction time of a group of people.



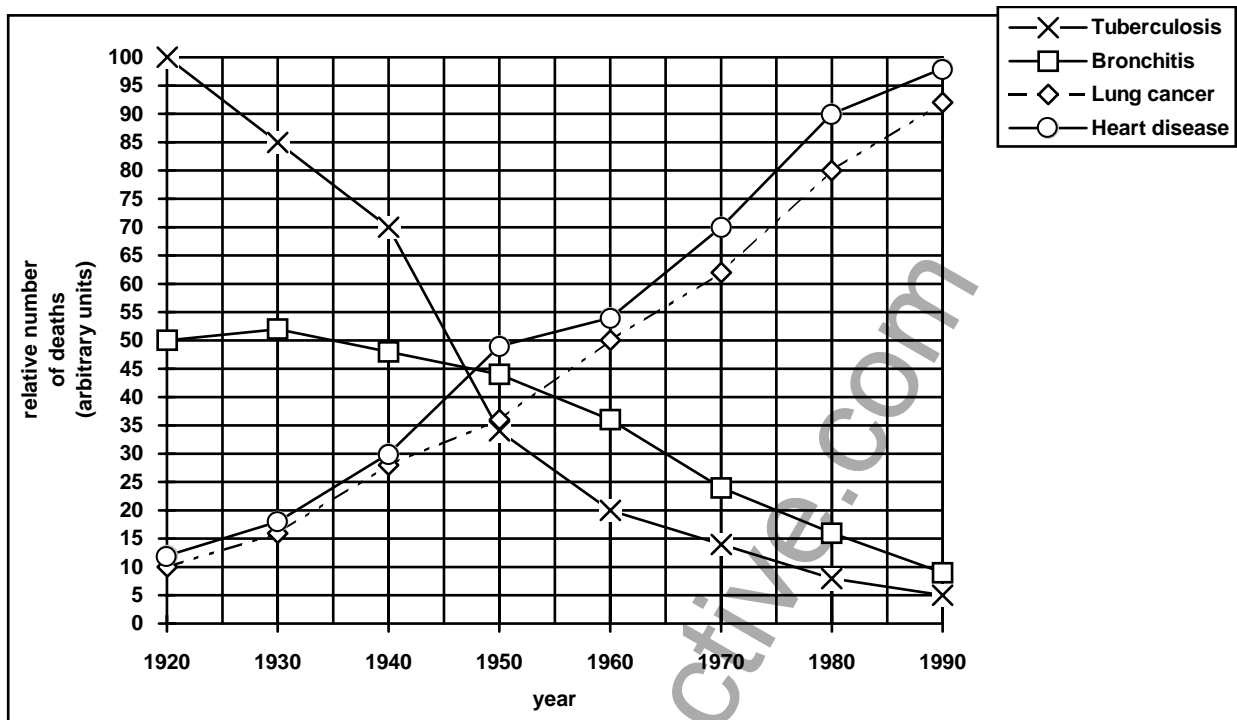
(a) What is the normal mean reaction time?  
..... [1]

(b) Calculate the change in the mean reaction time when the amount of alcohol increases from 2 to 6 units.  
.....  
.....  
.....  
..... [2]

(c) What is the relationship between reaction time and the amount of alcohol in the blood?  
.....  
..... [1]

(d) Use the information in the graph to explain why it is dangerous to drink and drive.  
.....  
.....  
..... [3]

The graph shows the relative numbers of deaths from several diseases over the last 70 years



- (a) What was the relative number of deaths from tuberculosis
- (i) in 1940?  
 ..... [1]
- (ii) in 1990?  
 ..... [1]
- (iii) Suggest a reason for this change.  
 ..... [1]
- (b) What do the trends in the relative number of deaths from heart disease and lung cancer have in common?  
 ..... [1]
- (c) In which year did the number of deaths from lung cancer first exceed the number of deaths from tuberculosis?  
 ..... [1]
- (d) What do tuberculosis and bronchitis have in common?  
 ..... [1]

Medium Demand Questions

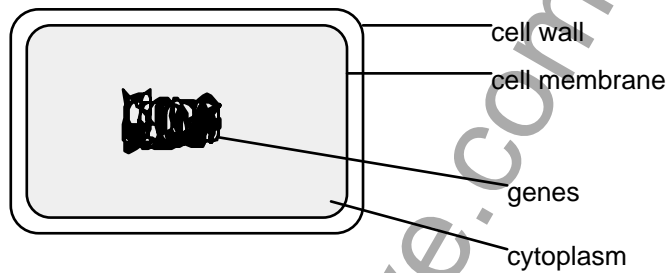
QUESTIONSHEET 5

Disease can be caused by microbes such as bacteria.

- (a) Name two other types of microbes which can cause disease.

.....  
 ..... [2]

The diagram shows the structure of a bacterial cell.



- (b) Use the information in the diagram to write a description of a bacterial cell.

.....  
 .....  
 .....  
 ..... [4]

- (c) Explain how microbes cause disease.

.....  
 ..... [2]

The body has a several ways of preventing microbes entering the body.

- (d) Complete the table by writing in the name of the correct organ or structure. [3]

How the organ prevents the entry of microbes	Name of organ or structure
Produces clots to seal wounds	
Acts as a barrier	
Produces sticky mucus to trap microbes	

Medium Demand Questions

QUESTIONSHEET 6

Shortage of vitamins and minerals may cause deficiency diseases.

(a) Name the mineral or vitamin lacking in the diet when a person develops

(i) rickets

..... [1]

(ii) scurvy

..... [1]

(b) State the symptoms of

(i) rickets

..... [2]

(ii) scurvy

..... [2]

Read the following passage.

**Anaemia**

Anaemia is a deficiency in the amount of the pigment haemoglobin in the blood.

There are three main causes of anaemia -

1. Loss of blood through severe bleeding.
2. Disease of the bone marrow where the red cells are produced.
3. A lack of iron in the diet which is essential for the formation of haemoglobin.

Anaemia is a very common condition and surveys have shown that about 5% of women are anaemic while up to 30% have no iron reserves. The condition is less common in men.

The symptoms of anaemia may be very mild depending on the degree of shortage of iron but typically the patient will be pale, tired and short of breath when exerting themselves.

(c) (i) Give two symptoms of anaemia.

..... [2]

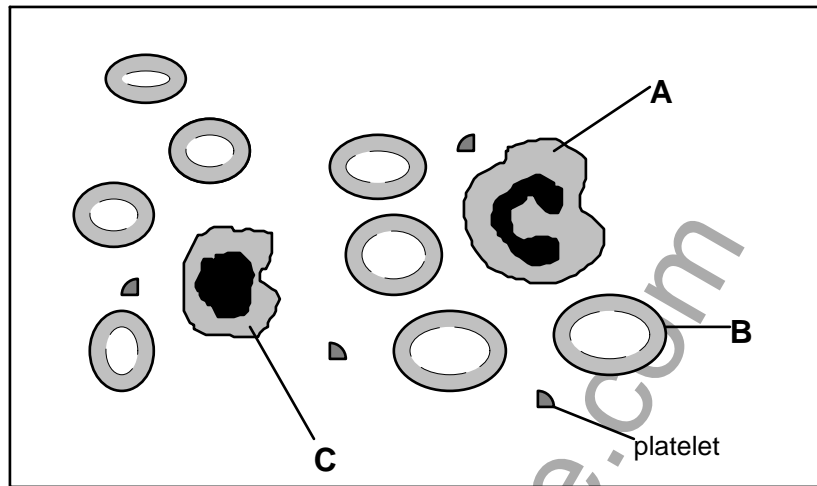
(ii) Explain why anaemia is more common in women than men.

..... [2]

(iii) Explain why people with anaemia are usually tired and short of breath

..... [2]

The diagram shows a sample of blood.



(a) Name the cells labelled A and B.

.....  
..... [2]

(b) Which of the three types of cell, A, B or C produces antibodies?

..... [1]

(c) How do antibodies help to prevent infection?

..... [1]

(d) Some types of blood cell use a process called phagocytosis to help protect the body from infection. Explain how phagocytosis protects the body from infection.

.....  
..... [2]

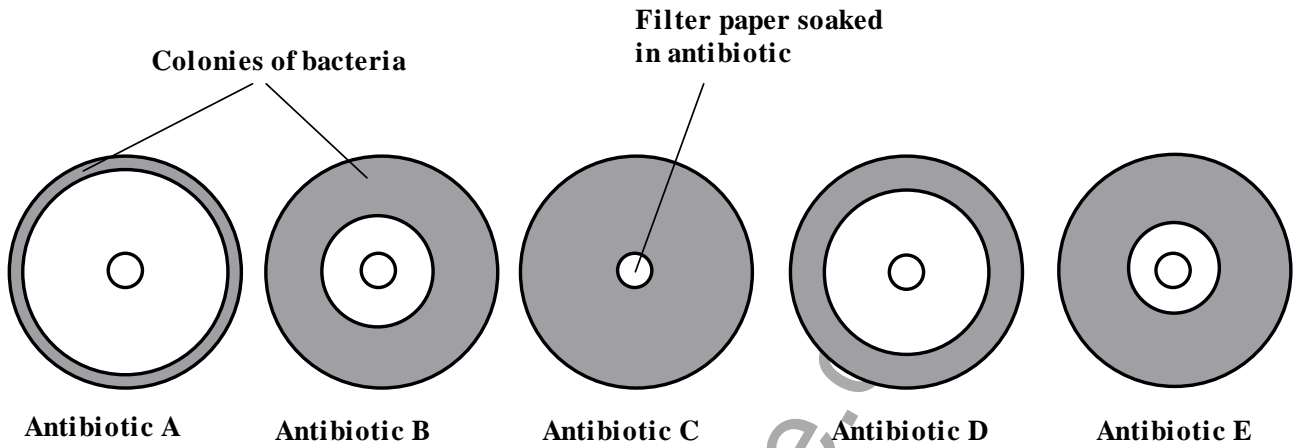
(e) What part do platelets play in preventing infection?

.....  
..... [2]

Medium Demand Questions

QUESTIONSHEET 8

An investigation was carried out to find out which of 5 antibiotics was the most effective. Five culture plates of the same bacterium were grown. Discs of filter paper soaked in the same strength of a different antibiotic was placed on each plate. The plates were incubated for 2 days. The diagrams show the results.



- (a) Which antibiotic is
- (i) most effective against the bacteria?  
 ..... [1]
- (ii) least effective against the bacteria?  
 ..... [1]
- (b) What causes the clear area around the filter paper?  
 .....  
 ..... [2]
- (c) The bacterium used in this investigation causes food poisoning. Describe how you could find the lowest strength of antibiotic to use against the bacteria which cause food poisoning.  
 .....  
 .....  
 .....  
 .....  
 ..... [5]



Study the following table

Name of disease	Type of causative organism	Method of spread	Method of prevention or treatment
Poliomyelitis	virus	through air and water	immunisation
Measles	virus	through the air	immunisation
Chickenpox	virus	through the air	immunisation
Tetanus	bacterium	through infected cuts	immunisation
Blood poisoning	bacterium	through infected cuts	antibiotics
AIDS	virus	contaminated body fluids, sexual intercourse	no treatment available
Tuberculosis	bacterium	through the air	immunisation
Pneumonia	bacterium	through the air	antibiotics
Diphtheria	bacterium	through the air	immunisation
Food poisoning	bacterium	contaminated food	antibiotics

- (a) Which disease is caused by a virus and spreads through water?  
 ..... [1]
- (b) Which bacterial disease is spread through contaminated food?  
 ..... [1]
- (c) What do the diseases which are treated with antibiotics have in common?  
 ..... [1]
- (d) Tuberculosis can affect a number of body organs but commonly affects the lungs.  
 Describe how the disease spreads from one person to another.  
 .....  
 .....  
 ..... [3]

Read the following passage.

### Drugs and drug abuse

Drug abuse is commonly described as the use of drugs which leads to either physical, mental, economic or social harm to the user or to other people who may be affected by the user's behaviour.

The term is commonly associated with the mis-use of illegal drugs such as heroin, LSD, cocaine and barbiturates but it applies equally to drugs such as tobacco and alcohol and drugs obtained by prescription.

Dependence on drugs falls into two categories -

1. Psychological dependence is an emotional state of craving for a drug whose presence in the body has a desired effect or whose absence has an undesired effect. Most people are very mildly dependent on the caffeine in tea or coffee. Dependence on cannabis falls into this category.

2. Physical dependence is a condition where the body undergoes chemical changes as a result of taking the drug and deprivation of the drug causes physical symptoms called withdrawal symptoms. In the case of heroin, an addict who is deprived of the drug will within a few hours develop severe abdominal pains, sweating and muscular tremors. In some cases, the symptoms can be fatal. The dangers to the health of the addict range from the danger of an overdose to diseases such as AIDS and blood poisoning transmitted by infected needles which are often shared. Addicts have a high death rate from liver disease and damage to the kidneys and brains are common.

- (a) Name three illegal drugs named in the passage.

.....  
.....  
..... [3]

- (b) Explain why the body becomes physically dependent on a drug.

..... [1]

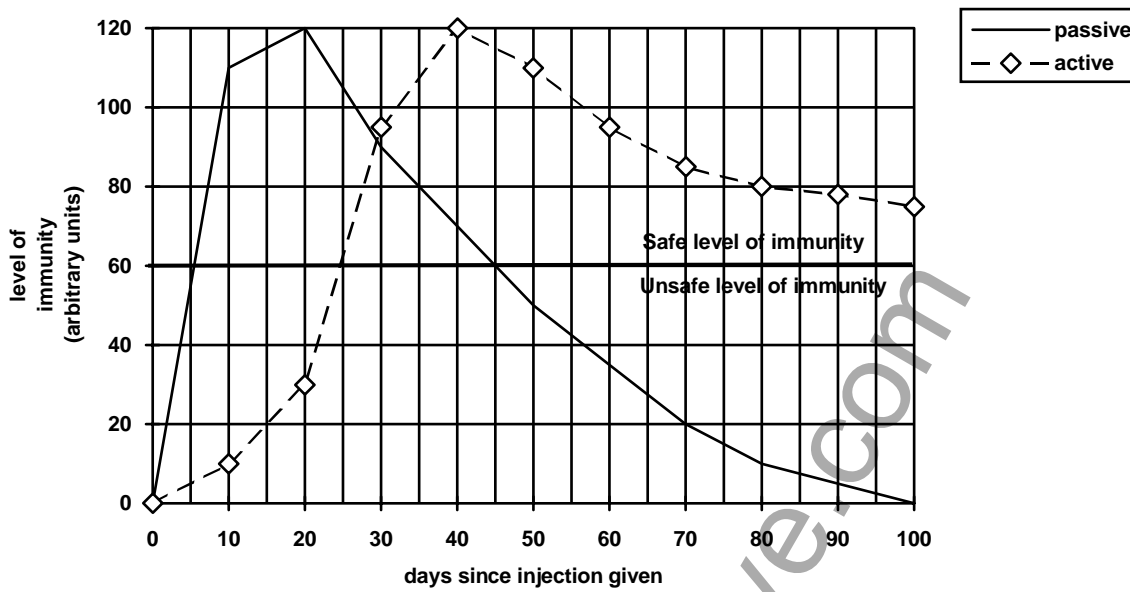
- (c) Name two withdrawal symptoms given in the passage.

.....  
..... [2]

- (d) Suggest how drug abuse can lead to social or economic harm to the addict.

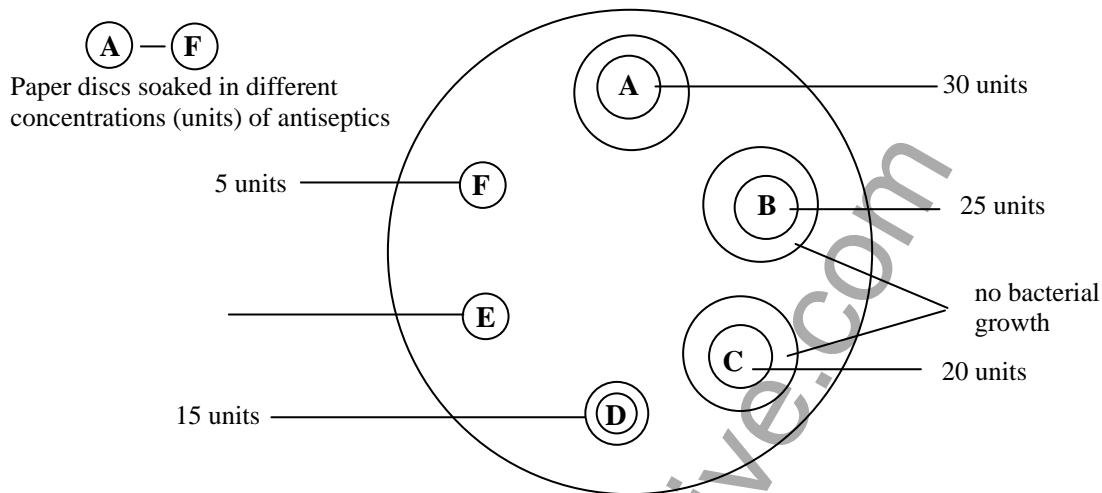
.....  
..... [2]

The graph shows two methods by which immunity to a disease can be brought about.



- (a) A safe level of immunity is given at 60 arbitrary units.  
How does it take for each method to give a safe level of immunity?
- (i) Passive method  
..... [1]
- (ii) Active method  
..... [1]
- (b) Which method loses its effect most quickly?  
..... [1]
- (c) How long after the injection does it take for the passive method to reach a peak?  
..... [1]
- (d) (i) Which method would be most suitable for a person who had been in close contact with an infected person?  
..... [1]
- (ii) Give a reason for your answer.  
..... [1]
- (e) How is passive immunity given?  
..... [1]

Bacteria living in plaque produce acids that dissolve the enamel of teeth. These bacteria were grown on a nutrient agar plate and used to test a new antiseptic mouthwash. The diagram shows the results of testing different concentrations of this antiseptic mouthwash on plaque bacteria.



- (a) (i) Which concentration of antiseptic would you recommend the manufacturer to use? Explain your answer.

concentration:

..... [1]

explanation:

..... [1]

- (ii) Suggest how an antiseptic mouthwash could help to prevent tooth decay.

..... [2]

- (iii) Some mouthwashes contain an alkali. Suggest why this may help to prevent tooth decay.

..... [1]

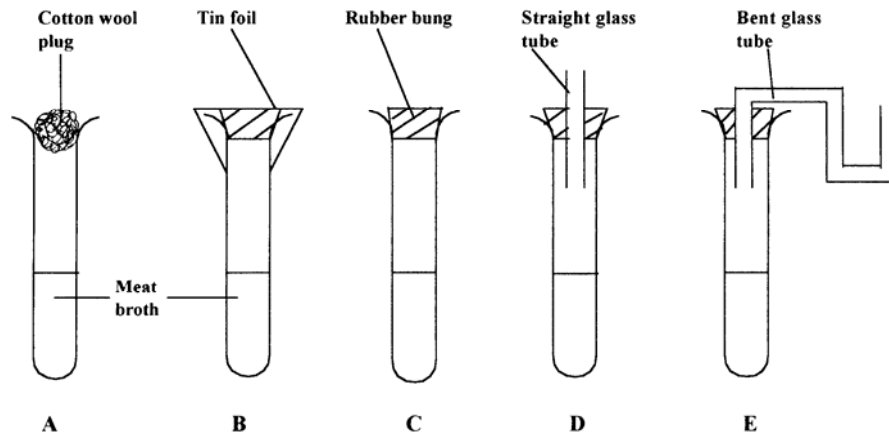
- (b) To help prevent tooth decay people are advised to brush their teeth at least once each day and use a toothpaste containing fluoride. Explain the reasons for this advice.

..... [3]

High Demand Questions

QUESTIONSHEET 13

An investigation was carried out to find out how quickly food can spoil. Equal amounts of meat broth were placed in to five boiling tubes which were then sealed and treated as shown in the diagram.



Treatment	None	Sterilised	Sterilised	Sterilised	Sterilised
Storage conditions	25°C in lab.	25°C in lab	25°C in lab	25°C in lab	25°C in lab

(a) After three days the meat broth in some of the tubes became cloudy. What caused the cloudiness?

..... [1]

(b)(i) Which **one** of the tubes went cloudy first?

..... [1]

(ii) Give a reason for your answer.

..... [2]

(c) The meat broth in two of the tubes did not go cloudy after three days.

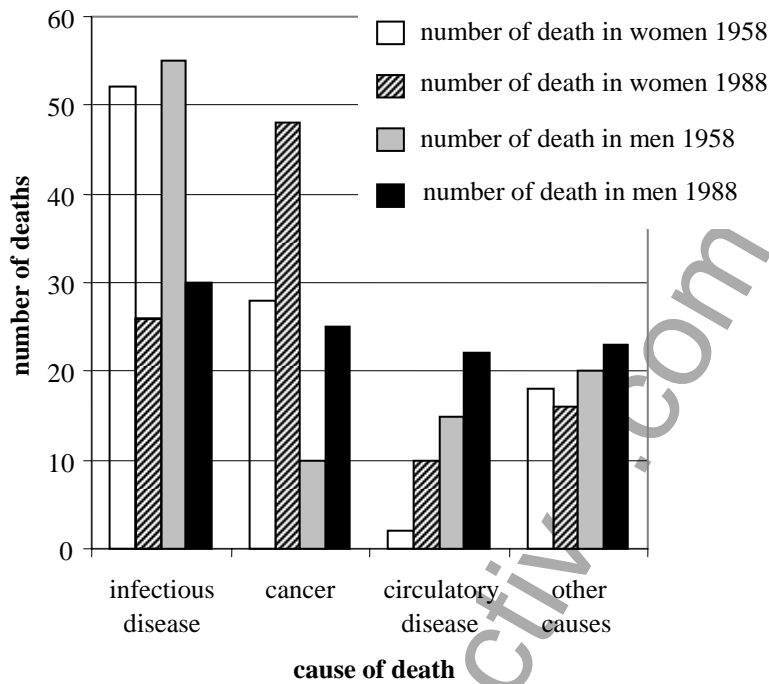
(i) Which tubes did not go cloudy?

..... [2]

(ii) Give a reason why each tube did not go cloudy.

..... [2]

The bar chart shows information in a publicity leaflet produced by an insurance company. It shows the causes of death in 100 women and 100 men in 1958 and 1988.



- (a) What was the major cause of death in:
- (i) women in 1958?  
..... [1]
  - (ii) women in 1988?  
..... [1]
- (b) How is the pattern of causes of death different in 1988 from that in 1958?
- 1. .... [1]
  - 2. .... [1]
  - 3. .... [1]
- (c) Suggest and explain a reason for the changes in cause of death between 1958 and 1988 from:
- (i) infectious disease;  
.....  
.....  
..... [2]

QUESTIONSHEET 14 CONTINUED

(ii) cancer;

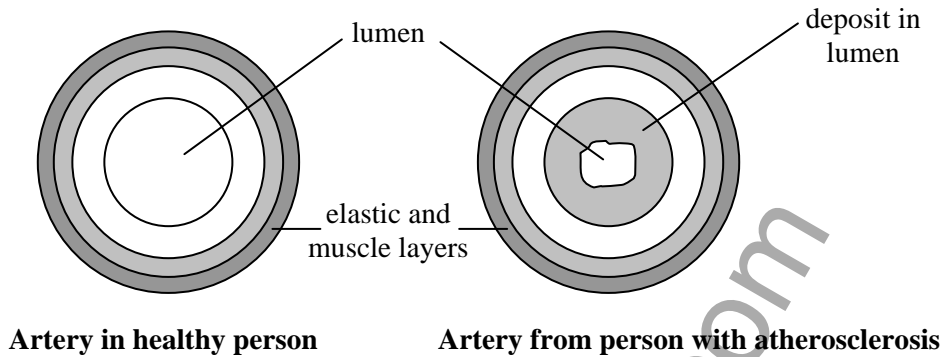
.....  
.....  
..... [2]

(iii) heart disease;

.....  
.....  
..... [2]

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The diagram shows a cross-section of an artery from a healthy person and from a person suffering from atherosclerosis.



- (a) Give two differences between the normal artery and the artery from the person with atherosclerosis.

.....  
 ..... [2]

- (b)(i) How would the blood in the artery from the person with atherosclerosis be affected?

..... [1]

- (ii) Give a reason for this.

..... [1]

- (c) The coronary arteries supply the heart muscle with blood.  
 Explain how the functioning of the heart would be affected if atherosclerosis affected the coronary arteries.

.....  
 .....  
 .....  
 ..... [4]



## High Demand Questions

## QUESTIONSHEET 16

(a) (i) Name the type of organism which causes cholera.

..... [1]

(ii) How is this organism spread from person to person?

..... [1]

(b) One of the symptoms of cholera includes almost non-stop severe diarrhoea.  
Fluid loss can be as much as 20 litres per day.

(i) Explain how cholera may cause death in 24 hours.

..... [1]

(ii) Explain why the transfusion of saline (salt and water) solution is used to treat cholera.

..... [1]

(iii) Why are people suffering with cholera given antibiotics?

..... [1]

(c) Explain why AIDS cannot be treated by antibiotics.

..... [1]

(d) When antibiotics are prescribed people are given the following advice.  
Suggest one reason for each piece of advice.

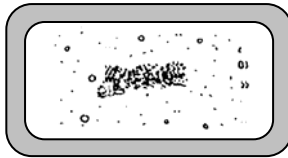
(i) Take only the recommended dose.

..... [1]

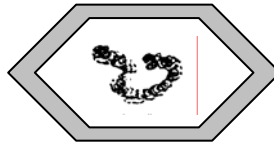
(ii) Complete the course of treatment.

..... [1]

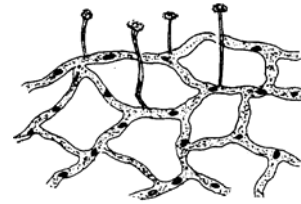
The diagram shows three types of microbe.



Bacterium



Virus



Fungus

(a) Which of these microbes

- (i) causes influenza? ..... [1]
- (ii) can be destroyed using antibiotics? ..... [1]
- (iii) can only live and reproduce inside living cells? ..... [1]
- (iv) is used to produce a vaccine against tuberculosis? ..... [1]
- (v) have structures called hyphae? ..... [1]
- (vi) is used to produce a vaccine against hepatitis? ..... [1]

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## High Demand Questions

## QUESTIONSHEET 18

(a) The list gives five methods of producing vaccines against microbial diseases.

1. Using the killed organism.
2. Using a live non-virulent strain of the organism.
3. Separating antigens from the organism and using the antigens as a vaccine.
4. Using a genetically engineered organism to mass produce a vaccine.
5. Chemically changing a toxin molecule so that it is no longer toxic but resembles the toxin antigenically.

Use the numbers 1-5 to match the method of producing the vaccine to the disease for which it is used.

- (i) Hepatitis B ..... [1]
- (ii) Whooping cough ..... [1]
- (iii) Influenza ..... [1]
- (iv) Tuberculosis ..... [1]
- (v) Diphtheria ..... [1]

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## High Demand Questions

## QUESTIONSHEET 19

- (a) State
- two**
- ways in which food may become unfit to eat.

.....  
 ..... [2]

- (b) Untreated milk contains large numbers of bacteria which use oxygen.
- 
- Resazurin is an indicator which changes colour as the oxygen concentration changes.

**Blue**       $\longrightarrow$       **Pink**       $\longrightarrow$       **Colourless**  
**High concentration of oxygen**       $\longrightarrow$       **Low concentration of oxygen**

In an investigation resazurin was used to test the keeping qualities of three types of milk, **A**, **B** and **C**.  
 1cm<sup>3</sup> of resazurin was added to 10cm<sup>3</sup> of each sample of milk.  
 The samples were sealed and left at 25°C for one hour.  
 The table shows the results of the investigation.

Time / minutes	Colour of milk samples with resazurin		
	A	B	C
0	Blue	Blue	Blue
60	Pink	Blue	Colourless

- (i) Suggest
- one**
- reason for sealing the samples.

..... [1]

- (ii) Explain what happened in milk sample C to turn the resazurin colourless.

.....  
 ..... [3]

- (iii) The three types of milk which were tested are listed below. Identify each, using
- one**
- letter, A, B, or C.

Untreated (raw) milk \_\_\_\_\_ Pasteurised milk \_\_\_\_\_ Sterilised milk [1]

- (c) For each of the following state how it helps to preserve food.

- (i) vacuum packing.

..... [1]

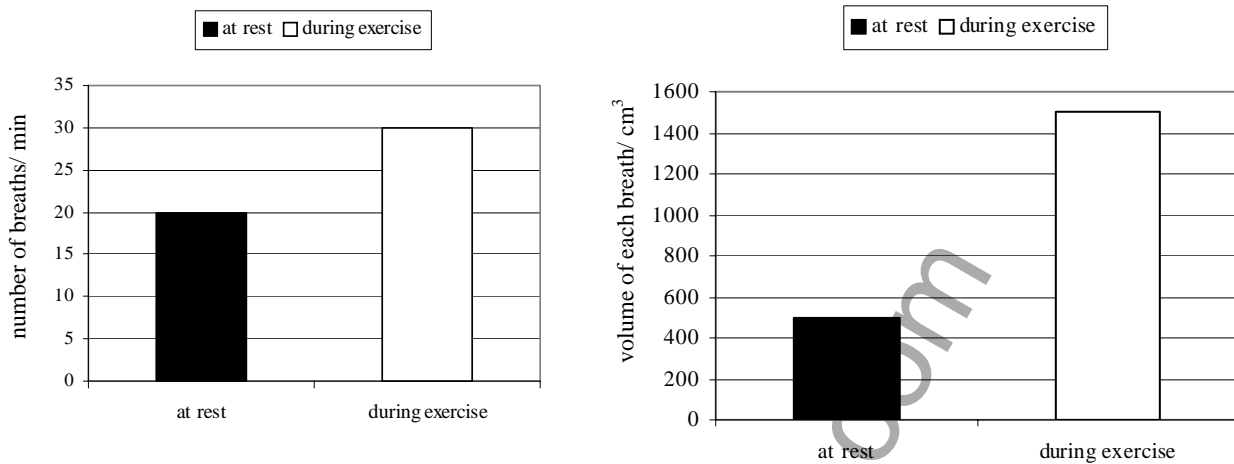
- (ii) dehydration.

..... [1]

- (iii) canning.

..... [1]

The bar chart shows the results of an investigation into the effects of exercise on a person's breathing.



- (a) (i) The total volume of air entering the lungs while the person was at rest was 10 000cm<sup>3</sup>. Calculate the total volume of air entering the lungs per minute during exercise. Show your working.

[2]

- (ii) What is the importance to the body of the increased air entering and leaving the lungs during exercise?

.....  
 ..... [2]

- (b) The table shows some information about four people and the effects of the same amount of exercise on their breathing

Person	number of breaths/ min.		Volume of each breath/ cm <sup>3</sup>	
	at rest	during exercise	at rest	during exercise
A. Never exercises. Drives to work. Main hobby is watching television.	22	38	400	1150
B. Plays golf once a week. Travels by train to work. Main hobby is gardening.	20	30	500	1500
C. Plays badminton twice a week. Walks to work. Main hobby is hill walking.	18	24	550	1600
D. Plays football once a week and trains twice a week. Cycles to work. Main hobby is dancing.	16	20	600	1850

(Continued...)

QUESTIONSHEET 20 CONTINUED

- (i) Use the information about these people to describe **three** ways in which regular exercise effects the breathing of people during rest and during standard exercise.

.....

.....

..... [3]

- (ii) Suggest why people who exercise are less likely to suffer from respiratory diseases.

.....

..... [1]

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