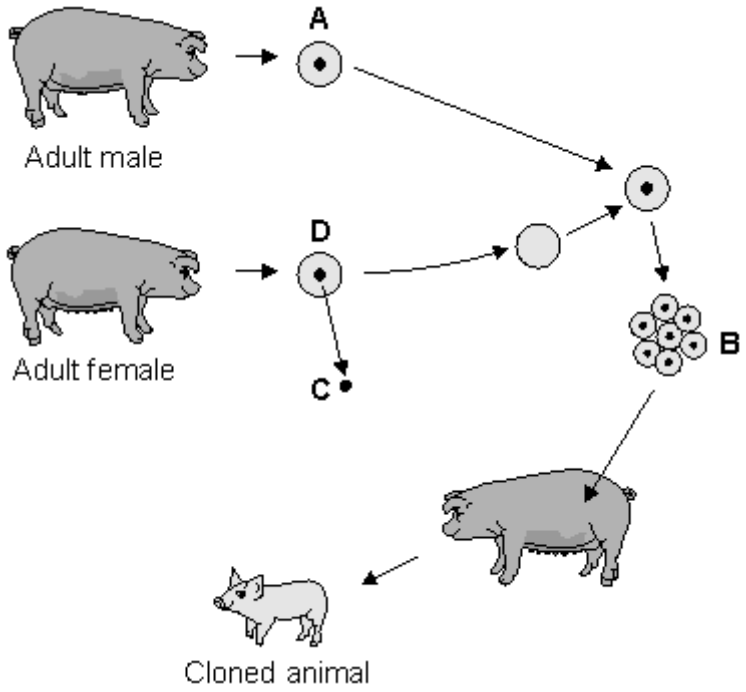
Q1. (a) The diagram shows how pigs can be cloned.



For each question write the correct letter in the box.

Which structure, **A**, **B**, **C** or **D** is:

(i) an egg cell ☐ **(1)**

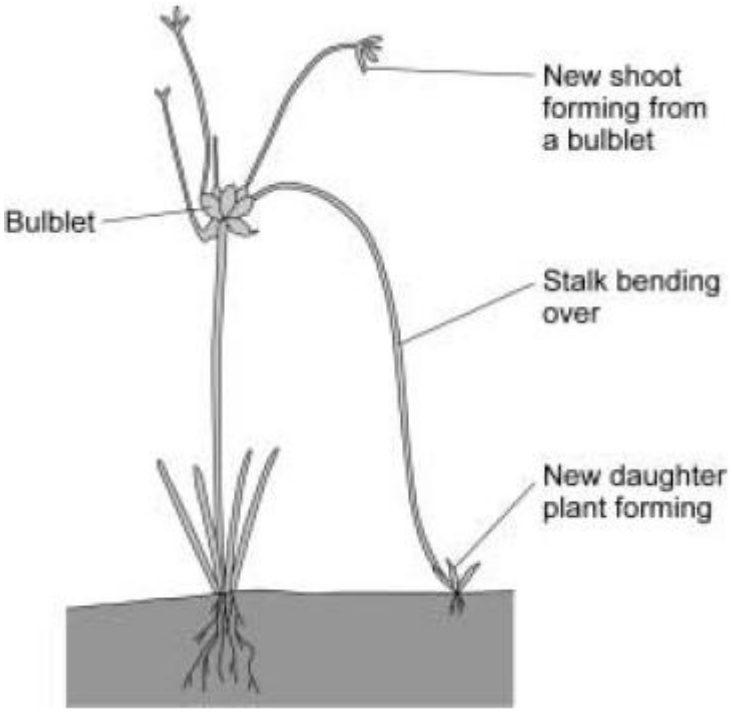
(ii) a nucleus ☐ **(1)**

(iii) an embryo? ☐ **(1)**

(b) Walking onion plants grow a bunch of bulblets (tiny bulbs).

The bulblets start to grow and the stalks bend over with the weight of the new growth.

This makes the onion plant seem to walk across the garden.



Producing plants in this way is called asexual reproduction.

Use words from the box to complete the following sentences.

chromosome	**clone**	**gamete**	**gene**	**parent**

Asexual reproduction needs only one ..... .

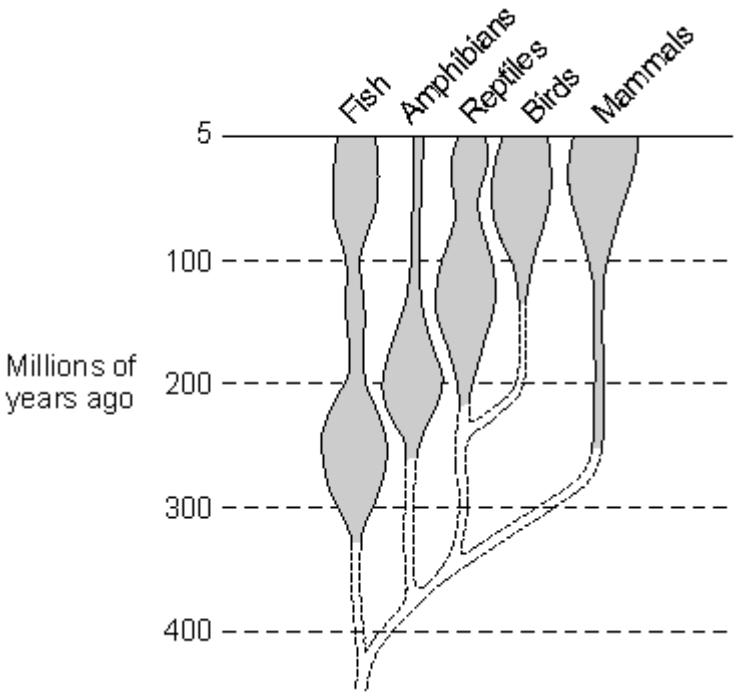
Asexual reproduction does not involve production of a ..... .

The daughter plant is called a ..... .

(3)
(Total 6 marks)

Q2. The diagram shows how the number of species in different vertebrate groups changed between 400 million years ago and 5 million years ago.

The wider a block is, the more species there are.



(a) Which group had most species 200 million years ago?

.....

(1)

(b) To which group are birds most closely related?

.....

(1)

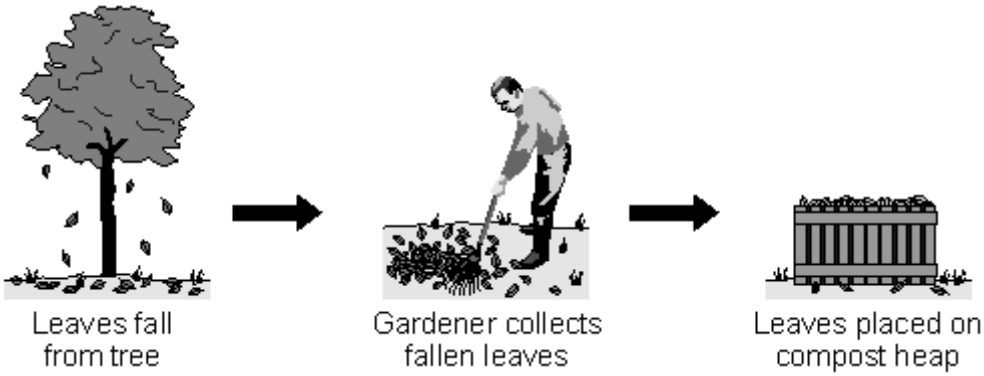
(c) Complete the following sentence.

A study of fossils gives evidence for the theory of .....

(1)

(Total 3 marks)

Q3. Gardeners often collect fallen leaves in autumn and place them on compost heaps.



(a) Over the next year the leaves decay.

Which living things cause leaves to decay?

.....

.....

(1)

(b) The leaves decay more quickly in summer than in winter.

Give **one** reason why.

.....

.....

(1)

(c) The compost heap has holes in its sides to allow gases to enter.

Which gas is needed for decay?

.....

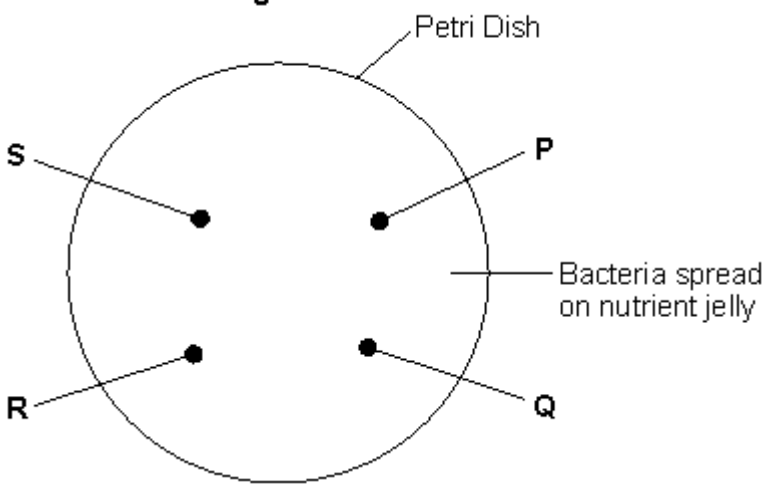
.....

(1)
(Total 3 marks)

Q4. Students investigated how well antibacterial mouthwashes worked.
They tested four different mouthwashes, **P**, **Q**, **R** and **S**.

- They spread bacteria on nutrient jelly in a Petri dish.
- They soaked identical discs of filter paper in mouthwashes **P**, **Q**, **R** or **S**.
- They placed the discs on the growing bacteria as shown in **Diagram 1**.
- They covered the Petri dish.
- They incubated the Petri dish for two days.

Diagram 1



(a) The nutrient jelly was heated to 120 °C before being poured into the Petri dish.

Why is this necessary?

Tick (✓) **one** box.

Statement	Tick (✓)
To make bacteria grow more quickly.	
To kill microorganisms.	
To make the nutrients dissolve.	

(1)

(b) What is the maximum temperature at which bacteria should be incubated in a school laboratory?

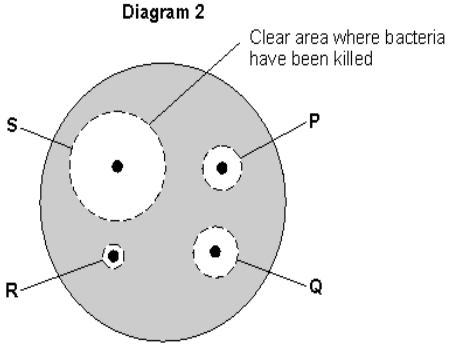
Tick (✓) **one** box.

Temperature	Tick (✓)
15 °C	
25 °C	
37 °C	

(1)

(c) **Diagram 2** shows the appearance of the Petri dish after two days.

Diagram 2



Which mouthwash, **P, Q, R** or **S** kills most bacteria? ☐

Give **one** reason for your answer.

.....

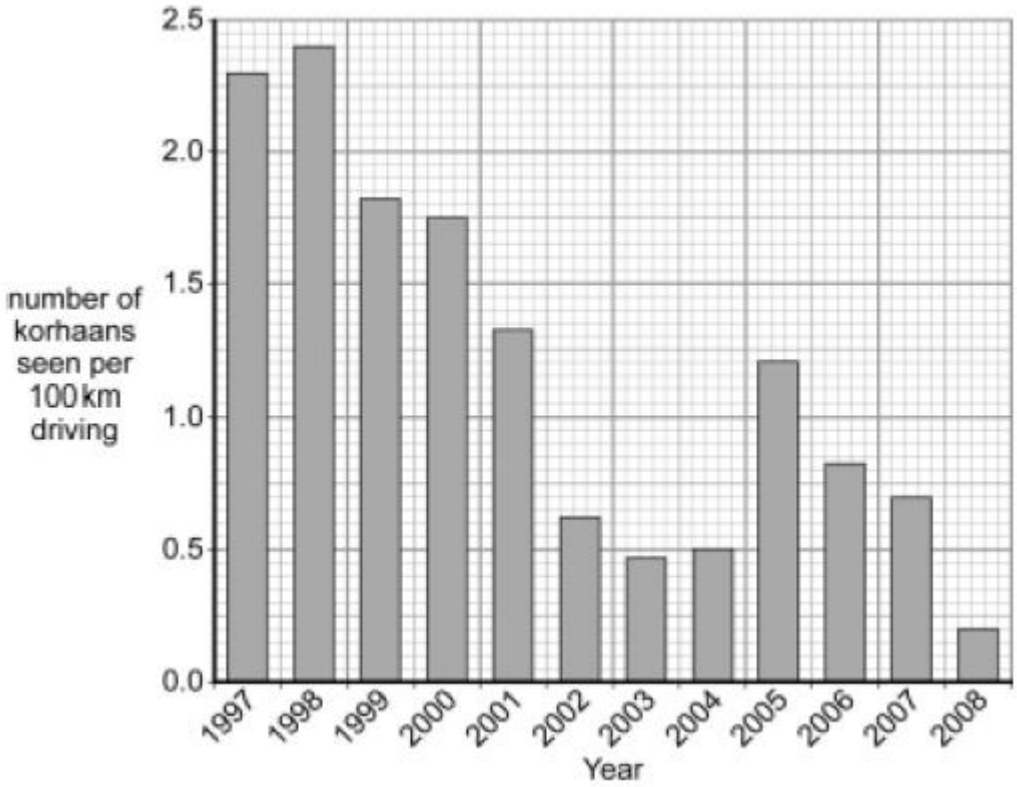
.....

(2)
(Total 4 marks)

Q5. The photograph shows a bird called the korhaan. Korhaans live in South Africa.

Thinkstock.com

- Scientists have studied changes in the numbers of korhaans since 1997.
- The scientists asked volunteer drivers to record the number of korhaans they see for every 100 km they drive on particular roads.
- The bar chart shows changes in the numbers of korhaans seen by the volunteers between the start of 1997 and the end of 2008.



Data from *Birds and Environmental Change: building an early warning system in South Africa* © South African National Biodiversity Institute

(a) This method of counting korhaans could have led to an inaccurate estimate of the number of korhaans.

Explain how.

.....

.....

.....

.....

(2)

(b) Which statement best describes the change in the number of korhaans between 1997 and 2008?

Tick (✓) **one** box.

Statement	Tick (✓)
There was a steady fall in the number of korhaans.	
The number of korhaans went up and down, but there was an overall fall in numbers.	
The number of korhaans went up and down, and there was no overall trend.	

(1)

(c) Korhaans live only amongst tall vegetation in areas of the country where there are few people.

Which is the most likely explanation for the change in the numbers of korhaans between 1997 and 2008?

Tick (✓) **one** box.

Statement	Tick (✓)
Many korhaans have been killed by cars.	
Many korhaans have been killed by people for food.	
The habitat of the korhaans is disappearing.	

(1)
(Total 4 marks)

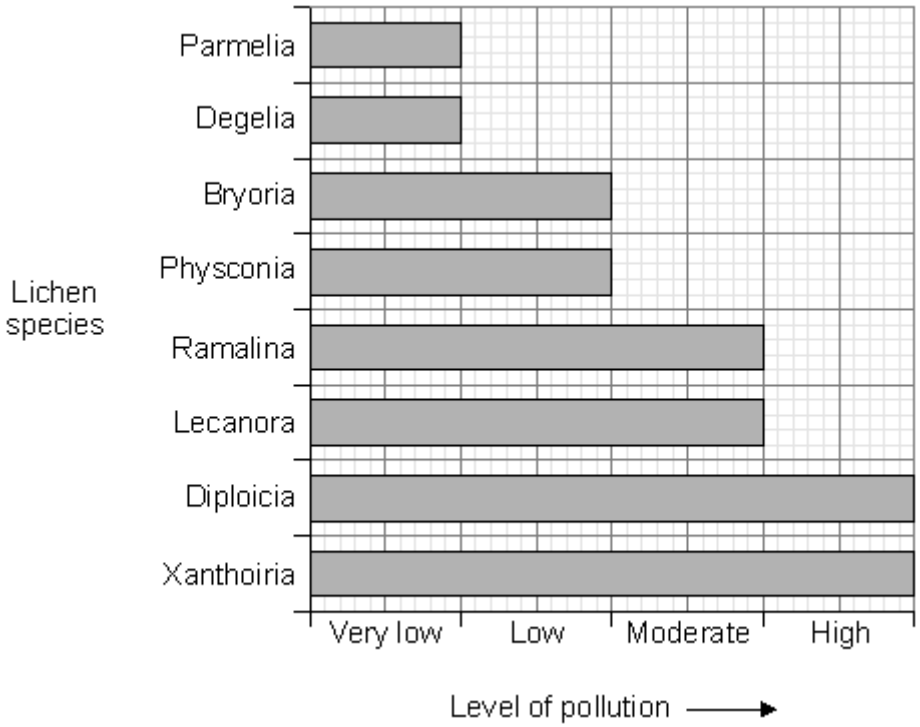
Q6. Lichens are pollution indicators.

(a) Complete the following sentence.

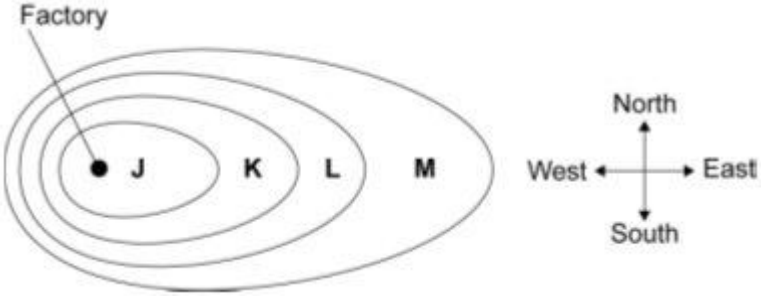
Lichens are indicators of the gas .....

(1)

The chart shows how much pollution different lichens can tolerate.



(b) The diagram shows the areas, **J**, **K**, **L** and **M**, in which different lichen species grew around a factory. The factory burns coal.



(i) In which direction does the wind blow the pollution from the factory?

Tick (✓) **one** box.

Wind direction	Tick (✓)
From the factory towards the north	
From the factory towards the east	
From the factory towards the south	
From the factory towards the west	

(1)

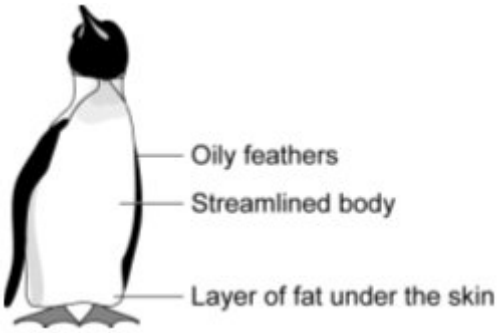
(ii) Which row in the table shows a correct distribution of lichens?

Tick (✓) **one** row.

Lichen in area J	Lichen in area K	Lichen in area L	Lichen in area M	Tick (✓)
Xanthoria	Diploicia	Parmelia	Ramalina	
Degelia	Bryoria	Lecanora	Xanthoria	
Xanthoria	Lecanora	Bryoria	Parmelia	

(1)
(Total 3 marks)

Q7. Emperor penguins have adaptations that help them to survive in very cold antarctic conditions.



Emperor penguins catch fish in the sea.

Use this information and information from the drawing to explain how the Emperor penguin is adapted to survive in the antarctic.

.....

.....

.....

.....

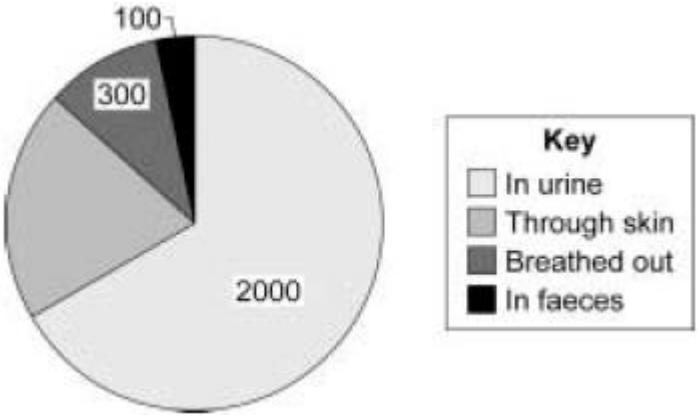
.....

.....

.....

(Total 3 marks)

Q8. Water is lost from the body in several ways.
The pie chart shows the volume of water lost, in cm^3, by a man on a cold day.



(a) (i) The total volume of water lost by the man was 3000 cm^3.

How much water was lost through the skin?

Volume of water lost through skin ..... cm^3

(1)

(ii) The same man lost 1200 cm^3 of water through the skin on a warm day.

Give **one** reason for the different volumes of water lost on the two days.

.....

.....

(1)

(b) To maintain water balance in the body, the total volume of water taken in must equal the total volume of water lost.
Give **two** ways this is achieved on a hot day, when compared to a cold day.
Tick (✓) **two** boxes.

The volume of water in the urine decreases. ☐

The volume of water in the faeces increases. ☐

The volume of water taken as food or drink increases. ☐

The volume of water breathed out decreases. ☐

(2)
(Total 4 marks)

Q9. Dr Semmelweiss collected data about the number of deaths in the two maternity wards in the hospital where he worked.

- From 1833 to 1838 there were the same number of doctors and midwives delivering babies in both **Ward 1** and **Ward 2.**
- From 1839 to 1847 medical students and doctors delivered babies in **Ward 1**; midwives delivered babies in **Ward 2**.

Dr Semmelweiss also noticed that doctors often came straight from examining dead bodies to the delivery ward.

The table shows the number of patients and the number of deaths in the two wards.

Years	Ward	Number of patients	Number of deaths	Death rate as deaths per 1000 patients
1833–1838	Ward 1	23 509	1505	64.0
	Ward 2	13 097	731	55.8
1839–1847	Ward 1	20 204	1989	98.4
	Ward 2	17 791	691	

(a) (i) Use the formula

$$\textbf{death rate} = \frac{\textbf{number of deaths} \times \textbf{1000}}{\textbf{number of patients}}$$

to calculate the death rate for **Ward 2** in the years 1839 - 1847.

.....

.....

Death rate = ... deaths per thousand

(2)

(ii) Suggest a hypothesis for the difference in the death rates on **Ward 1** and **Ward 2** in the years 1839 - 1847.

.....

.....

.....

.....

(2)

(b) Antibiotics are now used in hospitals.

What is an antibiotic, and what does it do?

.....

.....

.....

(2)

(c) MRSA is causing problems in hospitals.

Give **one** reason why.

.....

.....

(1)

(d) How can the work of Semmelweiss help to reduce the problems caused by MRSA?

.....

.....

(1)

(Total 8 marks)

Q10. The photograph shows a girl waiting to cross a road.

© Lionel Lassman

(a) Name **two** different sense organs she would use to detect when it is safe to cross the road.

1 .....

2 .....

(2)

(b) Which sense organ contains receptors that help the girl to keep her balance?

.....

(1)

(c) (i) Complete the sentence.

A car driver automatically brakes if a child dashes out into the road.

This is called a ..... action.

(1)

(ii) Draw a ring around the correct answer to complete the sentence.

In the nervous system, information passes along cells called	effectors neurones synapses	.

(1)
(Total 5 marks)

Q11. Animals have adaptations that enable them to survive.

(a) The photograph shows an echidna.

The echidna has pointed spines on its back.

Explain how these spines might help the echidna to survive.

.....

.....

.....

.....

.....

(2)

(b) The photograph shows a caterpillar.

© S.J. Krasemann / Peter Arnold / Still Pictures

Explain how the caterpillar's appearance might help it to survive.

.....

.....

.....

.....

.....

(2)

(c) Draw a ring around the correct answer to complete each sentence.

(i) Evolution can be explained by a theory called

genetic engineering

mutation

natural selection

.

(1)

(ii) This theory was suggested by a scientist called Charles [Darwin / Lamarck / Semmelweiss].

(1)

(iii) This scientist said that all living things have evolved from [monkeys / dinosaurs / simple life forms].

(1)

(d) Many religious people oppose the theory of evolution.

Give **one** reason why.

.....

.....

(1)

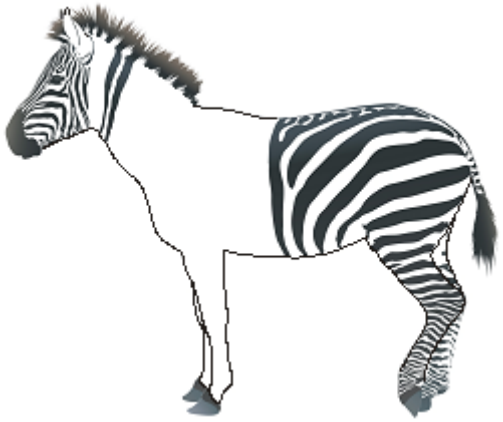
(Total 8 marks)

Q12. The photographs show a zorse and its parents, a zebra and a horse.

Horse

Zebra

Zorse



(a) Draw a ring around the correct answer to complete the sentence.

The zorse was produced by	cloning asexual reproduction sexual reproduction	.

(1)

(b) Explain the appearance of the zorse.

Use **both** words from the box in your explanation.

gametes	**genes**

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(3)
(Total 4 marks)

Q13. In-vitro fertilisation (IVF) is used to help infertile women to have babies.

The table gives statistics from one clinic that gives IVF treatment.

	Age of women given IVF treatment			
	Under 35 years	35 – 37 years	38 – 39 years	40 – 42 years
Number of women treated	425	208	106	53
Number of single births	90	44	17	1
Number of sets of twins	24	8	4	1
Number of sets of triplets	1	0	0	0

Use data from the table to help you to answer these questions.

(a) How many of the women aged 38 – 39 had babies?

.....

.....

(1)

(b) What proportion of the treated women aged 35 – 37 had twins?

.....

.....

(1)

(c) For which age group was IVF treatment most successful?

.....

.....

(1)

(d) Give **two** disadvantages of IVF treatment.

1 .....

.....

.....

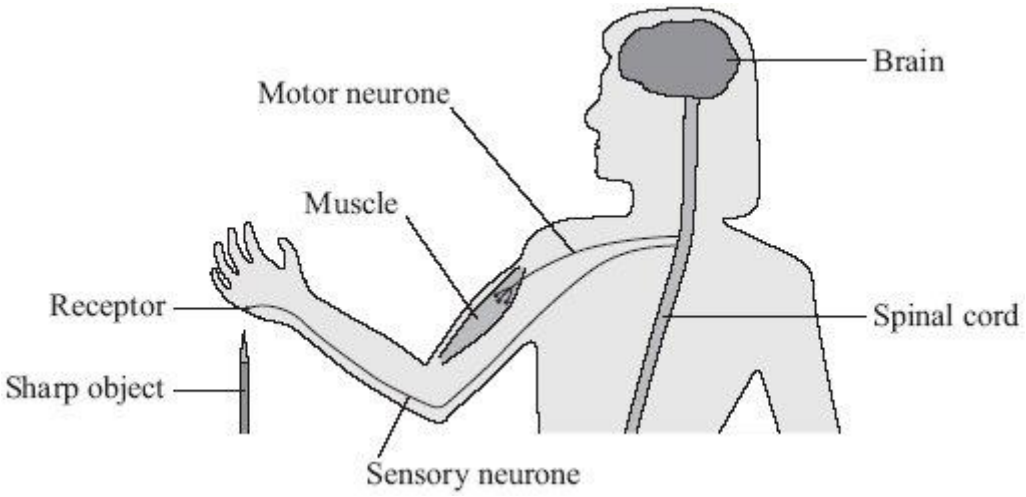
2 .....

.....

.....

(2)
(Total 5 marks)

Q14. A student accidentally touches a sharp object.
Her hand is immediately pulled away from the object.
The diagram shows the structures involved in this response.



(a) Use the correct word or phrase **from the diagram** to complete each sentence.

(i) The stimulus is detected by the .....

(1)

(ii) Impulses travel to the central nervous system along a

cell called a .....

(1)

(iii) Impulses travel from the central nervous system to the effector

along a cell called a .....

(1)

(iv) The hand is pulled away from the sharp object by the

.....

(1)

(b) Where in the body are there cells sensitive to:

(i) light .....

(1)

(ii) sound .....

(1)

(iii) changes in position?.....

(1)

(Total 7 marks)

Q15. Some organisms are in danger of extinction.

The photograph shows an African elephant feeding on tree leaves.

(a) Read the information about elephants and humans in Africa.

- The African elephant is the largest land animal.
- The African elephant feeds on lots of leaves.
- Adult African elephants have no natural predators.
- Elephants are killed by poachers for their ivory tusks.
- African elephants live for about 70 years.
- Most African elephants live in large herds.
- Land available to elephants is disappearing rapidly.

The African elephant is now extinct in many parts of Africa.

Use information from the list to give **three** reasons why.

1 .....

.....

2 .....

.....

3 .....

.....

(3)

(b) Organisms that are in danger of extinction can be cloned.

List A gives the names of three different cloning techniques.

List B gives information about these techniques.

Draw a line from each technique in **List A** to the correct information about it in **List B**.

List A Technique	List B Information
	Small groups of cells from parts of a plant are grown on a special jelly.
Adult cell cloning	
	Cells from a developing animal are separated before they become specialised and then placed into host mothers.
Embryo transplanting	
	Genes are cut out from chromosomes and inserted into other organisms.
Tissue culture	
	A nucleus is removed from an unfertilised egg cell. The nucleus from a body cell is inserted into the egg cell. An electric shock causes the egg to start to divide.

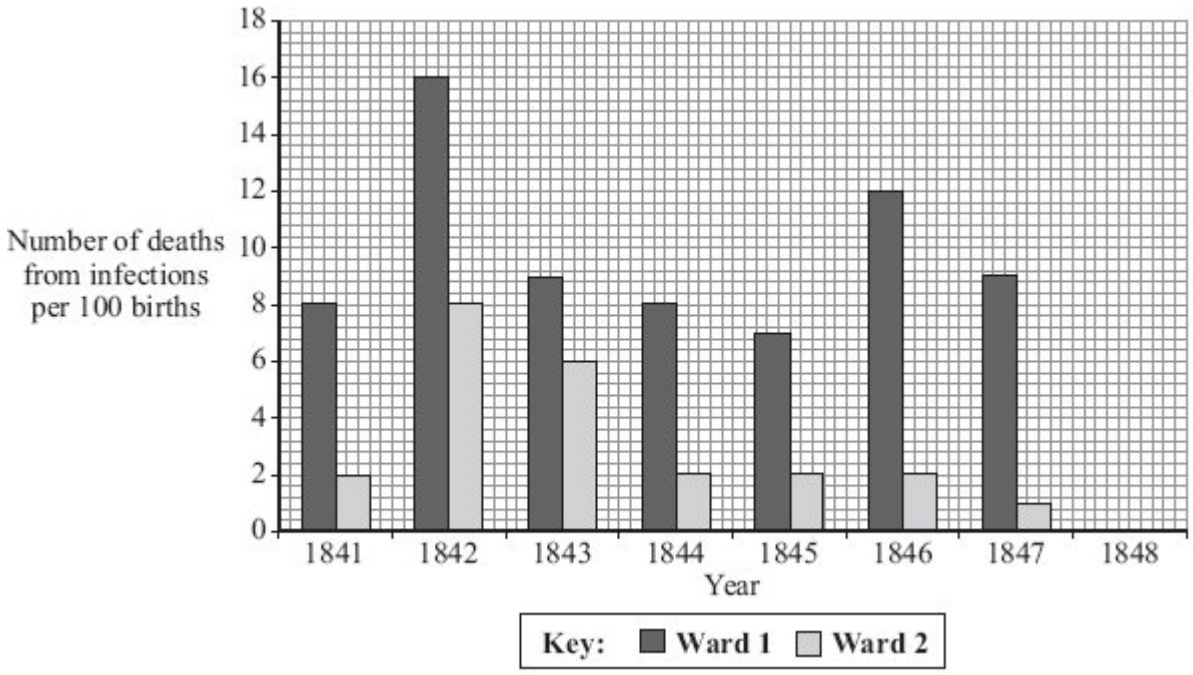
(3)
(Total 6 marks)

Q16. In the 19th century, Dr Semmelweiss investigated infection in a hospital.

He compared the number of deaths of mothers on two maternity wards.

- On **Ward 1**, babies were delivered mainly by doctors. These doctors worked on many different wards in the hospital.
- On **Ward 2**, babies were delivered by midwives. The midwives did **not** work on other wards.

The bar chart shows the results of his investigations.



(a) (i) 600 mothers gave birth on **Ward 2** in 1845.

How many mothers died from infections on **Ward 2** in 1845?

Show clearly how you work out your answer.

.....

.....

Number of mothers who died .....

(2)

(ii) Which was the safer ward on which to have a baby?

Draw a ring around your answer. **Ward 1** / **Ward 2**.

Using data from the bar chart, give a reason for your answer.

.....

.....

(1)

(b) In January 1848, Dr Semmelweiss asked all doctors to wash their hands before delivering babies.

The table shows the number of deaths on the two wards in 1848.

Ward	Number of deaths from infections per 100 births
Ward 1	3
Ward 2	1

(i) Plot this data on the bar chart above.

(1)

(ii) What was the effect on the death rate on **Ward 1** of doctors washing their hands before delivering babies?

.....

.....

(1)

(iii) Suggest an explanation for this effect.

.....

.....

(1)

(Total 6 marks)

Q17. (a) Microorganisms can be grown on agar jelly in a Petri dish.

List A gives three actions used when growing microorganisms.
List B gives four possible effects of these actions.

Draw a straight line from each action in **List A** to its effect in **List B**.

List A – Action	List B – Effect
	To reduce the growth of pathogens
The agar jelly is heated at 120 °C for 30 minutes	
	To kill unwanted microorganisms
Make sure the temperature for growing the microorganisms is no higher than 25 °C	
	To prevent microorganisms from the air getting into the Petri dish
The lid of the Petri dish is held on with tape	
	To prevent oxygen entering the Petri dish

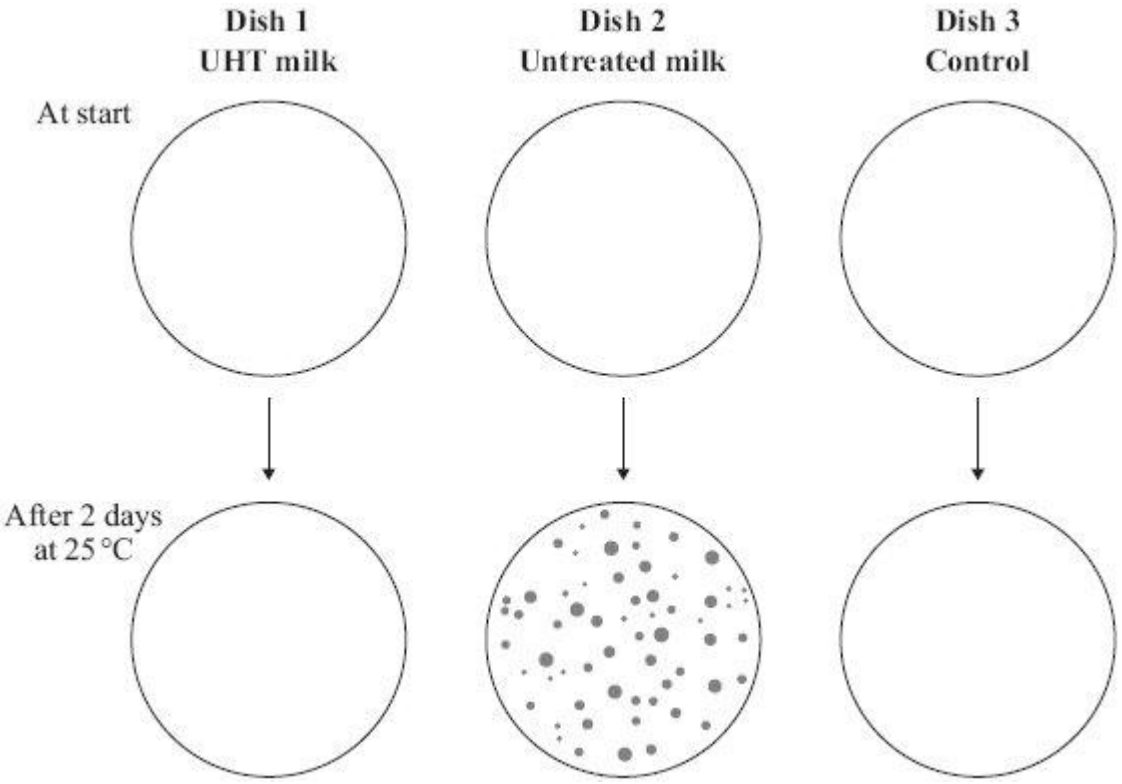
(3)

(b) UHT milk is milk that has been heated to 135 °C, then cooled.

In an investigation, three sterile Petri dishes containing sterile agar jelly were set up as follows.

- UHT milk was added to dish **1**.
- Untreated milk was added to dish **2**.
- Dish **3** was left unopened as a control.
- The dishes were kept at 25 °C for two days.

The results are shown in the diagram below.



(i) Describe the difference in appearance between dishes **1** and **2** after two days.

.....

.....

(1)

(ii) Give **one** reason for this difference.

.....

.....

(1)

(iii) There was no change in the appearance of dish **3** after two days.

Give **one** reason why.

.....

.....

(1)

(Total 6 marks)

Q18. The drawing shows a poison-dart frog.

(a) The poison-dart frog moves mainly by jumping.

Use information from the drawing to suggest **one** way in which this frog is adapted for jumping.

.....

.....

(1)

(b) Use the information below to suggest how the poison-dart frog is adapted for survival.

- This poison-dart frog is bright blue in colour.
- Animals that eat poison-dart frogs become very sick.

.....

.....

(1)
(Total 2 marks)

Q19. (a) Use words from the box to complete the sentences about controlling conditions in our bodies.

kidneys	liver	lungs	skin

(i) When we breathe out, water leaves the .....

(1)

(ii) When we sweat, water leaves the body through the .....

(1)

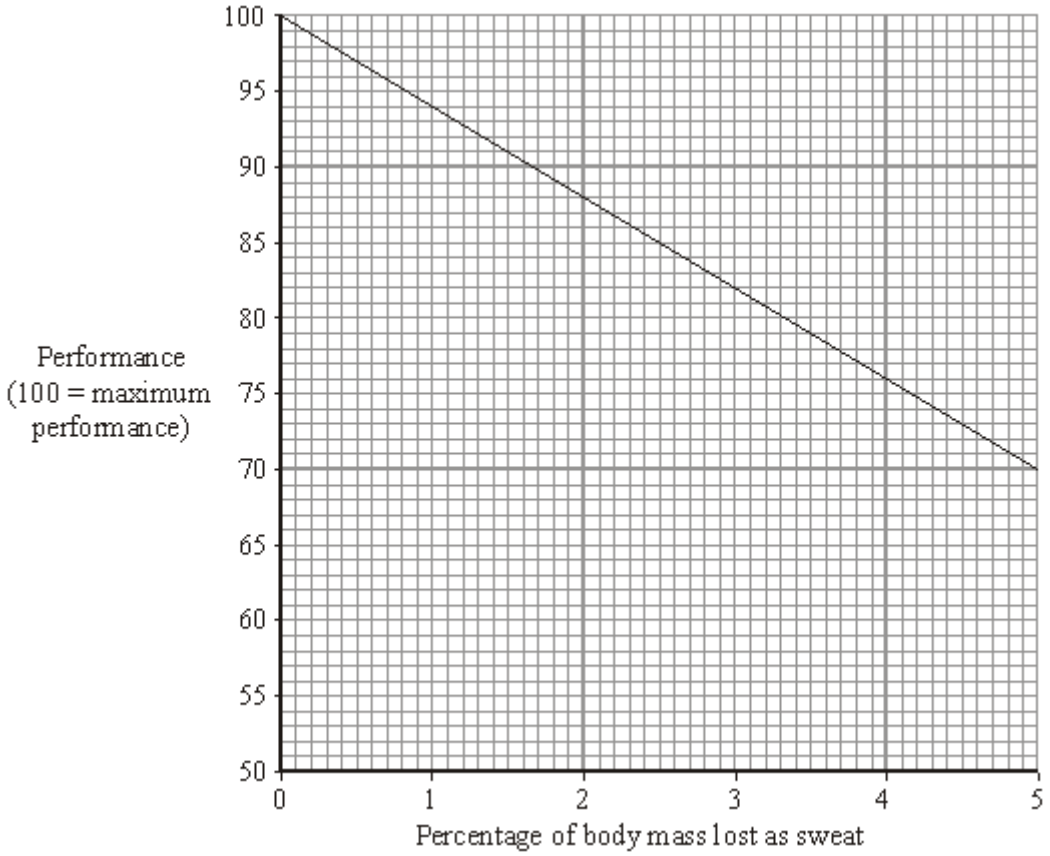
(iii) Excess water leaves the body in a liquid called urine.

Urine is produced by the .....

(1)

(b) We lose a lot of sweat during exercise. When this happens, we cannot perform as well as we could at the start of the exercise.

The graph shows the effect of losing sweat on the performance of an athlete.



(i) Describe the effect of losing sweat on performance.

.....

.....

(1)

(ii) How can athletes reduce this effect on performance?

.....

.....

(1)

(Total 5 marks)

Q20. Scientists have produced many different types of GM (genetically modified) food crops.

(a) Use words from the box to complete the sentence about genetic engineering.

clones	**chromosomes**	**embryos**	**genes**

GM crops are produced by cutting ..... out of the

..... of one plant and inserting them into the cells of a crop plant.

(2)

(b) Read the information about GM food crops.

- Herbicide-resistant GM crops produce higher yields.
- Scientists are uncertain about how eating GM food affects our health.
- Insect-resistant GM crops reduce the total use of pesticides.
- GM crops might breed naturally with wild plants.
- Seeds for GM crops can be bought from only one manufacturer.
- The numbers of bees will fall in areas where GM crops are grown.

Use this information to answer these questions.

(i) Give **two** reasons why some farmers are in favour of growing GM crops.

1 .....

.....

2 .....

.....

(2)

(ii) Give **two** reasons why many people are against the growing of GM crops.

1 .....

.....

2 .....

.....

(2)
(Total 6 marks)

Q21. Polio is a disease caused by a virus. In the UK, children are given polio vaccine to protect them against the disease.

(a) In the sentences below, draw a ring around the correct words in each box.

(i) It is difficult to kill the polio virus inside the body

because the virus	is not affected by drugs lives inside cells produces antitoxins

(1)

(ii) an	The vaccine contains	active infective inactive	form of the polio virus.

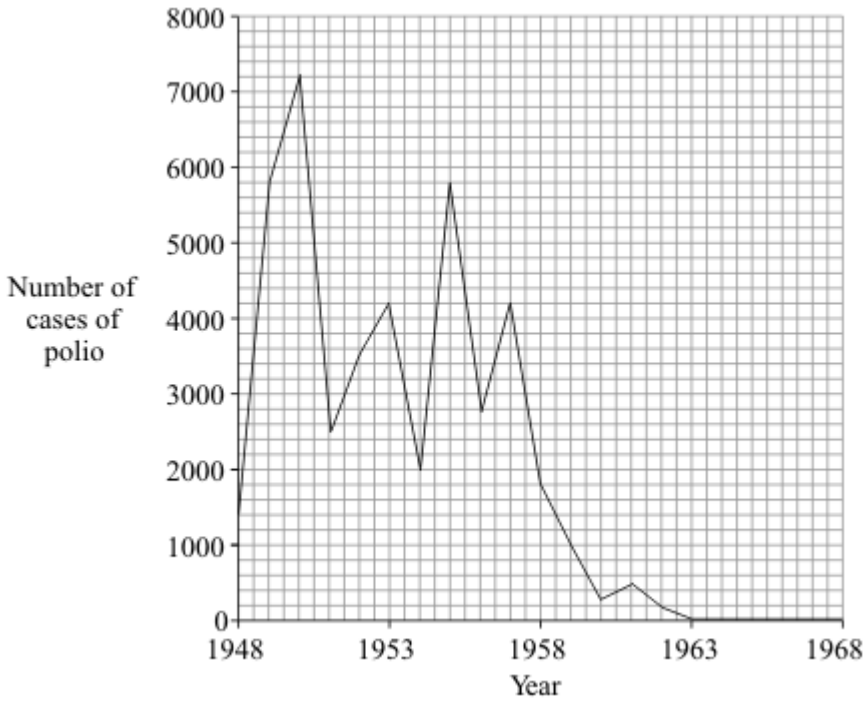
(1)

(iii) The vaccine stimulates the white blood cells to

produce	antibiotics antibodies drugs	which destroy the virus.

(1)

(b) The graph shows the number of cases of polio in the UK between 1948 and 1968.



(i) In which year was the number of cases of polio highest?

.....

(1)

(ii) Polio vaccination was first used in the UK in 1955.

How many years did it take for the number of cases of polio to fall to zero?

.....

(1)

(iii) There have been no cases of polio in the UK for many years. But children are still vaccinated against the disease.

Suggest **one** reason for this.

.....

.....

(1)

(Total 6 marks)

Q22. Copper compounds are found in water that has drained through ash from power stations. Invertebrate animals are used to monitor the concentration of copper compounds in water. First, scientists must find out which invertebrate animals can survive in a range of concentrations of copper compounds.

This is how the procedure is carried out.

- Solutions of different concentrations of a copper compound are prepared.
- Batches of fifty of each of five different invertebrate species, **A**, **B**, **C**, **D** and **E**, are placed in separate containers of each solution.
- After a while, the number of each type of invertebrate which survive at each concentration is counted.

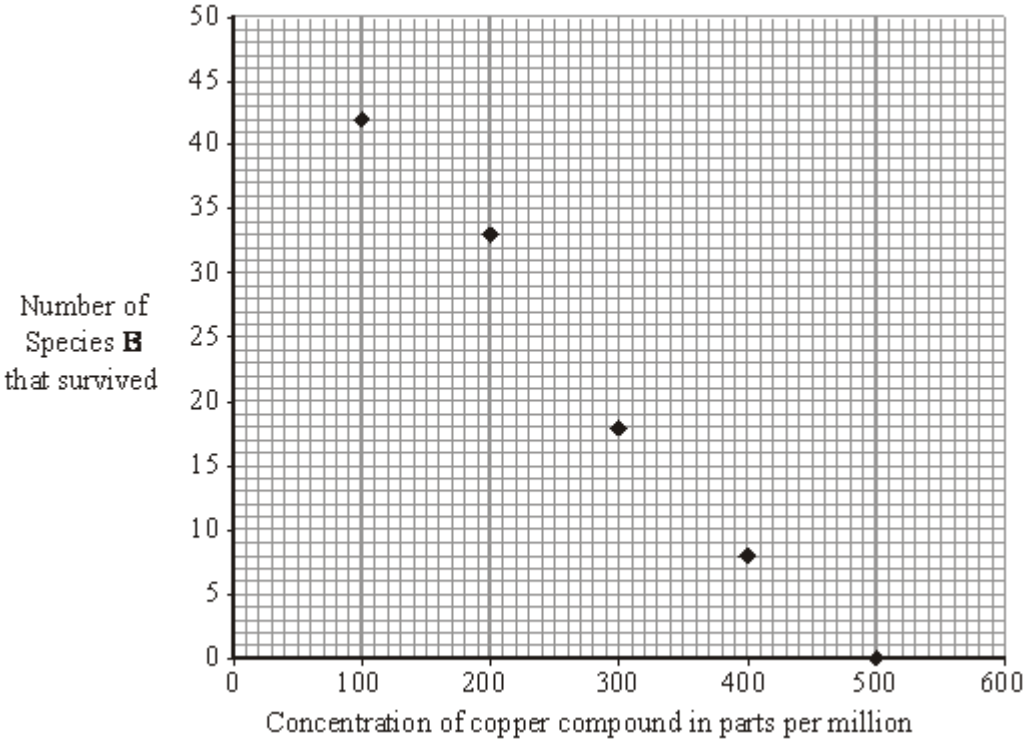
(a) Give **two** variables that should be controlled in this investigation so that the results are valid.

1 .....

2 .....

(2)

(b) The graph below shows the results for species **B**.

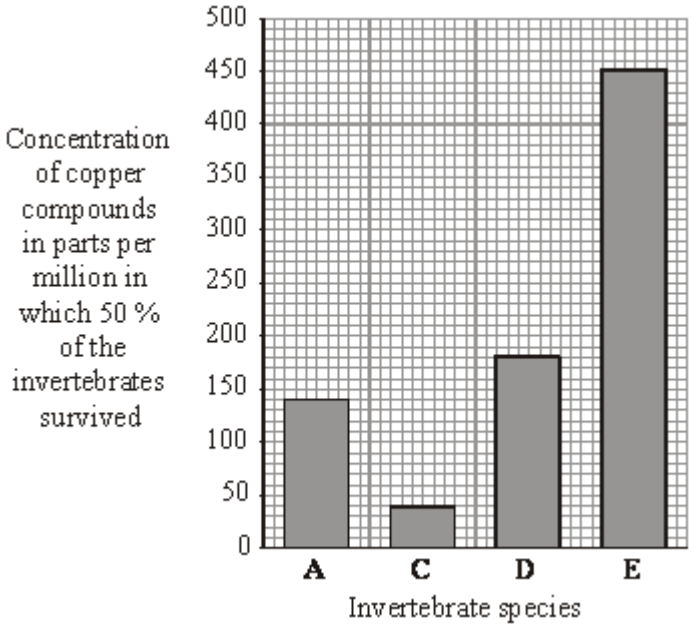


Use the graph to find the concentration of copper compounds in which 50% of Species **B** survived. To obtain full marks you must show clearly on the graph how you obtained your answer.

Concentration ..... parts per million

(2)

(c) The graph below shows the results of the tests on the other four invertebrate species.



(i) Which species, **A**, **C**, **D** or **E**, is most sensitive to the concentration of copper in the water?

.....

Give the reason for your answer.

.....

.....

(1)

(ii) It is often more convenient to use invertebrates rather than a chemical test to monitor water for copper.

Suggest **one** explanation for this.

.....

.....

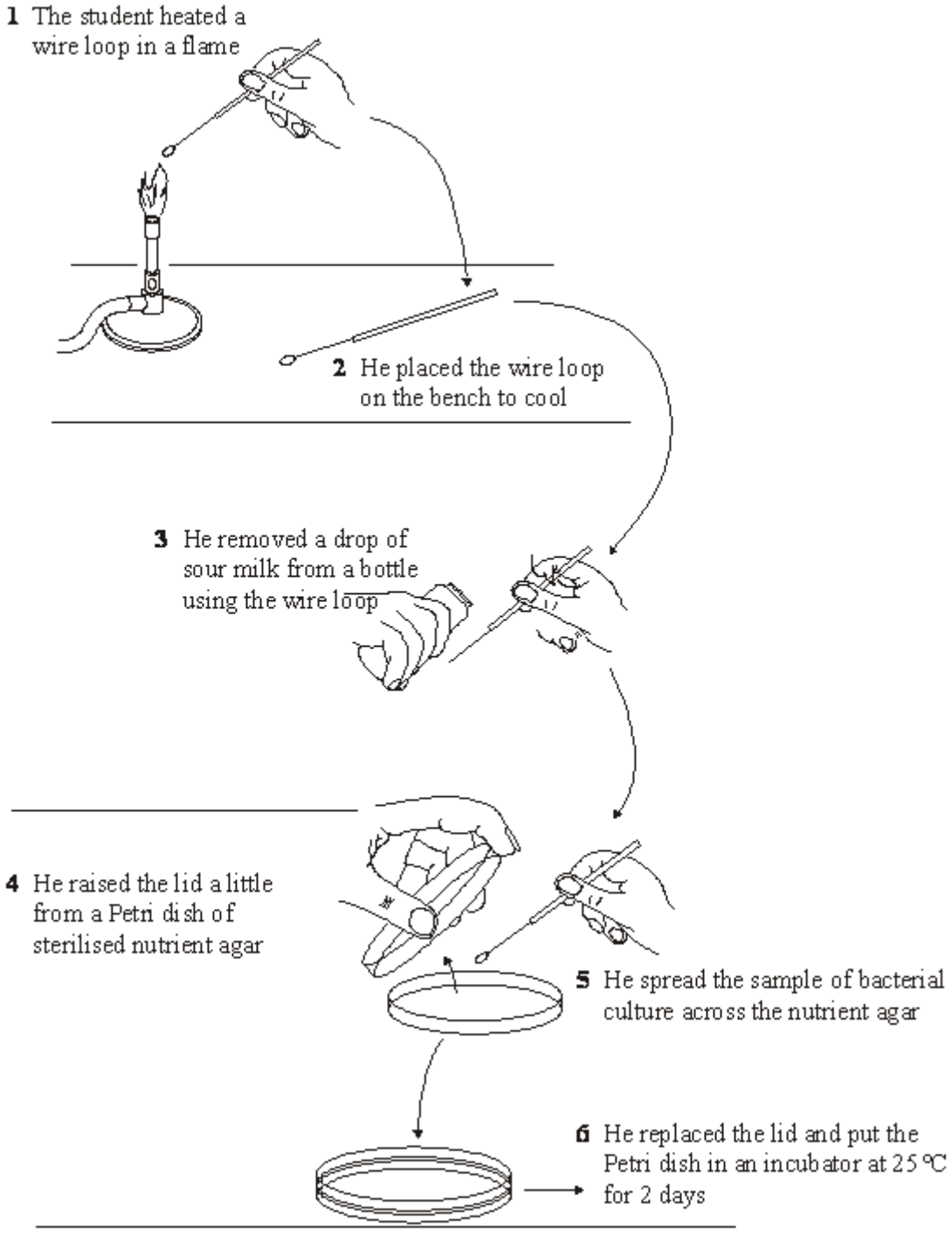
.....

.....

(2)

(Total 7 marks)

Q23. The diagram shows how a student transferred some sour milk from a bottle to a Petri dish of nutrient agar.



List A gives four actions carried out by the student.
List B gives five possible effects of these actions.

Draw a straight line from each action in List **A** to its effect in List **B**.
Draw only **one** line from each action.

List A – Action	List B – Effect
Heating loop in flame	Risk of contamination with bacteria increased
Placing loop on bench to cool	Risk of bacteria entering decreased
Only lifting lid of petri dish a little	Kills bacteria
Placing petri dish in incubator at 25°C rather than 35°C	Prevents air entering
	Risk of growth of pathogens decreased

(Total 4 marks)

Q24. The drawing shows a group of people in a café.

(a) Use words from the box to answer the questions.

brain	eye	nose	skin	tongue

Which organ contains receptors that allow a person to:

(i) read the newspaper .....

(1)

(ii) smell the coffee .....

(1)

(iii) feel how hot the cup is .....

(1)

(iv) taste the coffee? .....

(1)

(c) A cigarette manufacturer increased the amount of nicotine in cigarettes by 11% between 1997 and 2006. The manufacturer did not tell the public about this change.

(i) Suggest **one** reason why the manufacturer increased the amount of nicotine in the cigarettes.

.....

.....

(1)

(ii) Suggest **one** reason why the manufacturer did not tell the public about the change.

.....

.....

(1)

(Total 6 marks)

Q25. The drawing shows a kangaroo rat.

This rat lives in hot, dry deserts.

(a) Explain how each of the following features helps the kangaroo rat to survive in a hot, dry desert.

(i) It does not produce urine.

.....

.....

(1)

(ii) It lives in a burrow during the day, but comes out at night to search for food.

.....

.....

(1)

(iii) Its feet and its tail each have a large surface area.

.....

.....

(1)

(b) The kangaroo rat does **not** sweat.

Explain why **not** sweating could be dangerous for the animal.

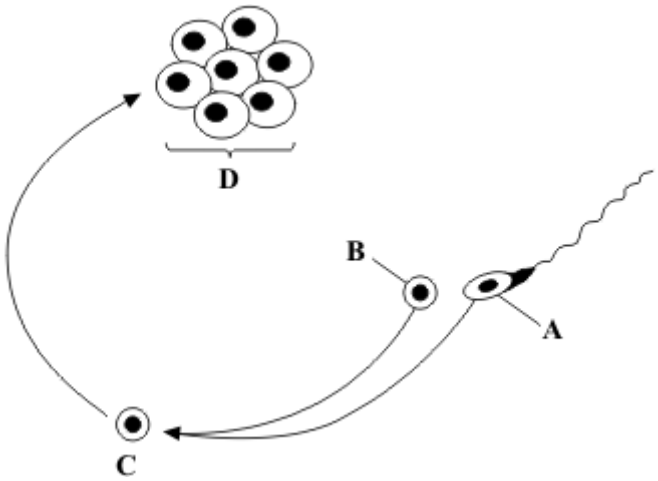
.....

.....

(1)

(Total 4 marks)

Q26. The diagram shows some of the stages in IVF (in-vitro fertilisation).



(a) Use words from the box to name structures **A, B, C** and **D.**

egg **embryo** **fertilised** **egg** **ovary** **sperm**

Structure **A** .....

Structure **B** .....

Structure **C** .....

Structure **D** .....

(4)

(b) What do the doctors do next with structure **D**?

.....

.....

.....

.....

(2)

(c) The table gives statistics for an IVF clinic.

	Age of women treated			
	Below 35 years	**35-37 years**	**38-39 years**	**40-42 years**
Number of women treated	414	207	106	53
Number of women who produced one baby	90	43	17	1
Number of women who produced twins	24	8	4	1
Number of women who produced triplets	1	0	0	0

(i) About what proportion of the treated women aged 35 − 37 produced one or more babies?

Draw a ring around your answer.

one quarter **one third** **half**

(1)

(ii) IVF treatment is not given by this clinic to women over 42 years of age.

Use data from the table to explain why.

.....

.....

.....

.....

.....

(2)

(iii) The committee which regulates IVF treatment now advises that only one embryo is used in each treatment.

Suggest **one** reason for this.

.....

.....

(1)
(Total 10 marks)

Q27. The diagram shows an evolutionary tree for a group of animals called primates.

The names of extinct animals are printed in italics *e.g. Nycticeboides*.

The drawings show animals that are alive today.

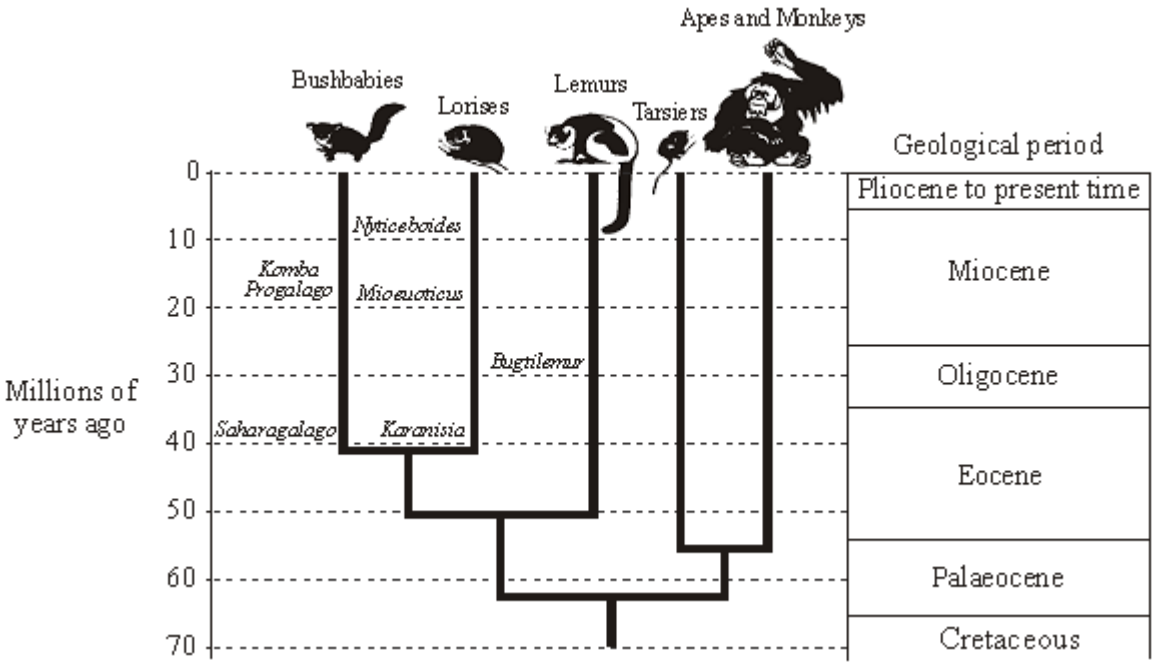


Illustration by Lucrezia Beerli-Bieler

(a) (i) How many million years ago did *Karanisia* first appear?

..... millions of years ago.

(1)

(ii) During which geological period did the Apes and Monkeys begin to evolve?

.....

(1)

(iii) Which group of primates alive today are the closest relatives of the Lorises?

.....

(1)

(b) Darwin was the first scientist to state that humans and other primates had common

ancestors.

Many people were against Darwin's ideas at that time.

Give **two** reasons why they were against his ideas.

1 .....

.....

2 .....

.....

(2)

(Total 5 marks)

Q28. Pathogens can enter the body and cause disease.

(a) (i) Name **one** type of medicine which kills bacteria in the body.

.....

(1)

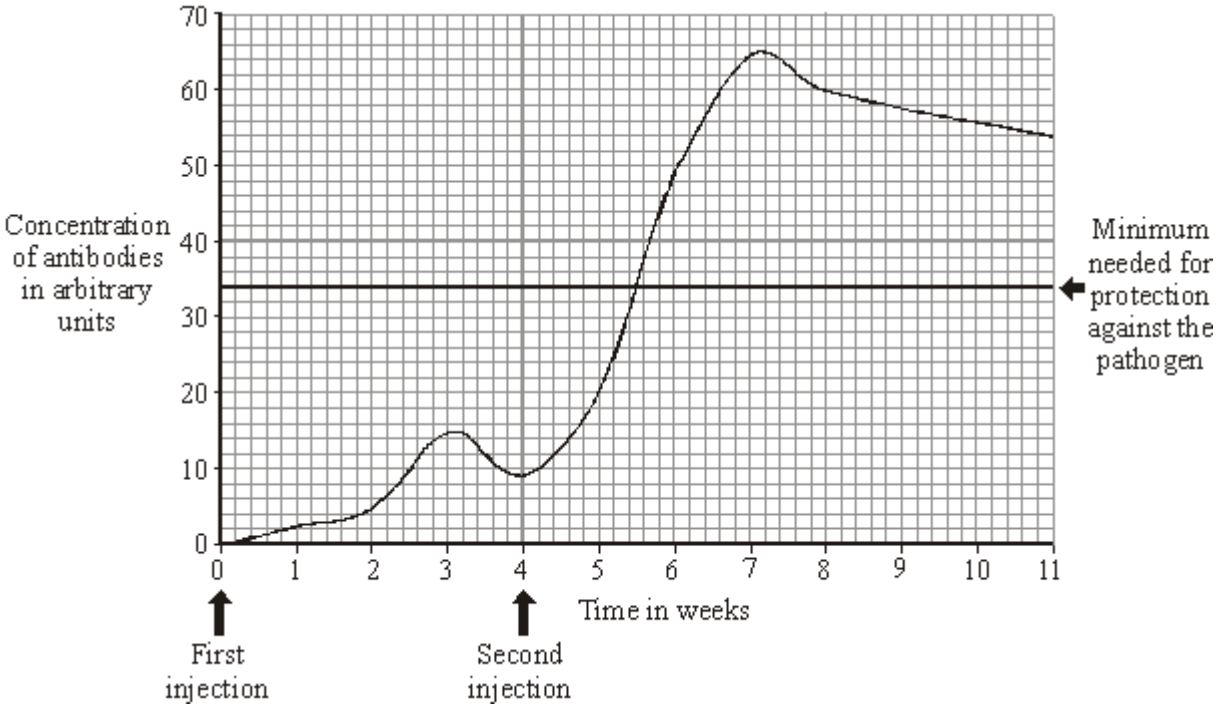
(ii) Name **one** type of medicine which helps to relieve the symptoms of infectious disease.

.....

(1)

(b) Vaccination protects us from pathogens.

The graph shows the concentration of antibodies in the blood of a person after two injections of vaccine given four weeks apart.



(i) How long after the first injection did it take for the concentration of antibodies to reach the minimum level for protection against the pathogen?

..... weeks

(1)

(ii) Describe what happened to the concentration of antibodies in the blood from week 0 to week 7.

.....

.....

.....

.....

.....

.....

.....

(3)

(iii) Would you expect the concentration of antibodies to stay above the level needed for protection against the pathogen over the next ten years?

Draw a ring around your answer. **Yes / No**

Give a reason for your answer.

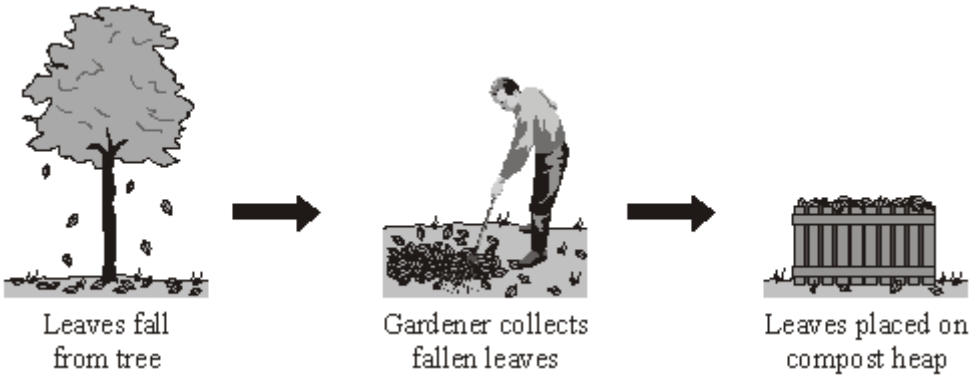
.....

.....

(1)

(Total 7 marks)

Q29. Gardeners often collect fallen leaves in autumn and place them on compost heaps.



(a) Over the next year the leaves decay.

Which living things cause leaves to decay?

.....

(1)

(b) The leaves decay more quickly in summer than in winter.

Give **one** reason why.

.....

.....

(1)

(c) The compost heap has holes in its sides to allow gases to enter.

Which gas is needed for decay?

Put a tick (✓) in the box next to your choice.

Carbon dioxide ☐

Nitrogen ☐

Oxygen ☐

(1)
(Total 3 marks)

Q30. The volume of water that the body loses must balance the volume of water that it gains.

Tables 1 and **2** show losses and gains of water by the body in one day.

Table 1
Losses of water by the body

Method	Volume in cm^3
breathing	300
sweating	600
faeces	
urine	100
Total	**2400**

Table 2
Gains of water by the body

Method	Volume in cm^3
drinking	1300
food	800
chemical reactions	300
Total	**2400**

(a) (i) Calculate the volume of urine lost by the body.

Show clearly how you work out your answer.

.....

.....

Volume of urine lost by the body = ... cm^3

(2)

(ii) What proportion of water gained by the body comes from food?

Put a tick (✓) in the box next to your choice.

$\frac{1}{4}$ ☐

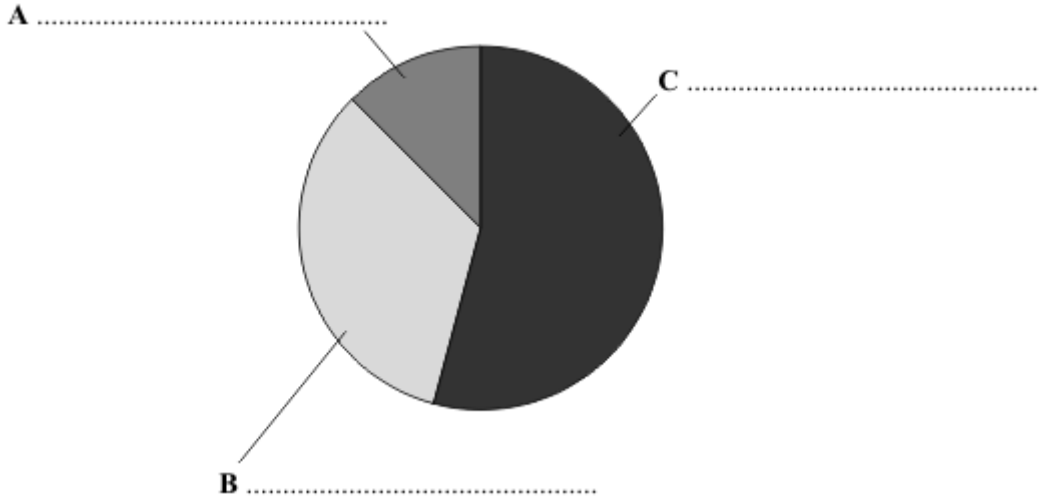
$\frac{1}{3}$ ☐

$\frac{1}{2}$ ☐

(1)

(b) One pupil decided to show the figures from **Table 2** as a pie chart.

Label sections **A**, **B** and **C** of the pie chart.



(1)

(c) How does sweating help the body?

.....

.....

(1)

(d) On a hotter day, the volumes of water lost and gained will be different.

What differences will there be?

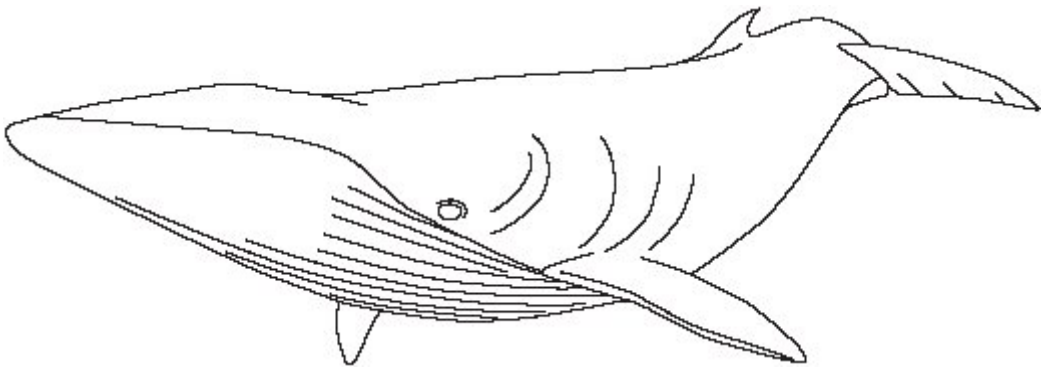
Tick (✓) **two** answers from the list.

More sweat produced	☐
More faeces produced	☐
More food eaten	☐
Less urine produced	☐
Less liquid drunk	☐

(2)
(Total 7 marks)

Q31. (a) **Figure 1** shows a minke whale. Whales live in the sea.

Figure 1



Write down **two** ways in which the body of the whale is adapted for swimming.

1 .....

.....

2 .....

.....

(2)

(b) **Figure 2** shows the skeleton of a minke whale.

Figure 2

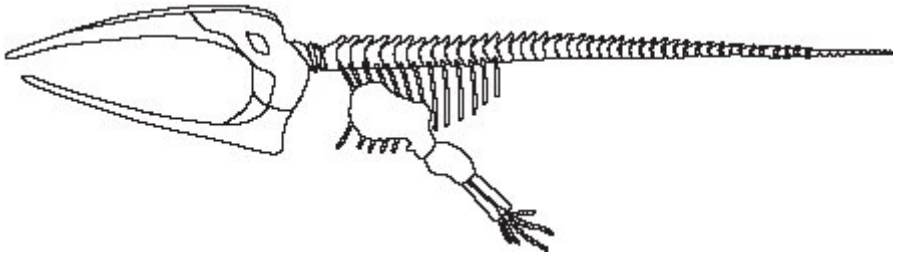
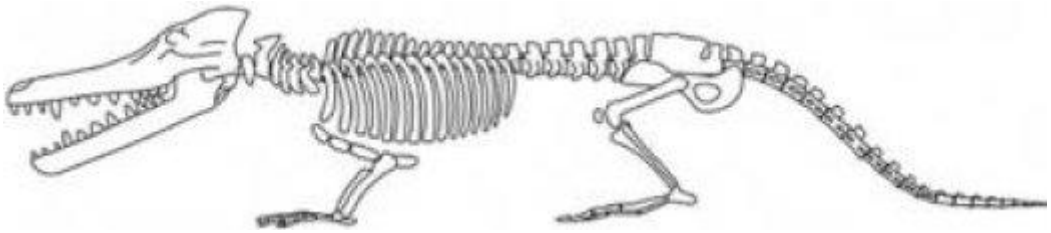


Figure 3 shows the fossil skeleton of an extinct whale.

Figure 3



Hans G Thewissen/ The Thewissen Lab

(i) Apart from size, give **two** differences between the skeleton of the minke whale and the fossil skeleton of the extinct whale.

1 .....

.....

2 .....

.....

(2)

(ii) In each of the sentences below, draw a ring around the correct answer.

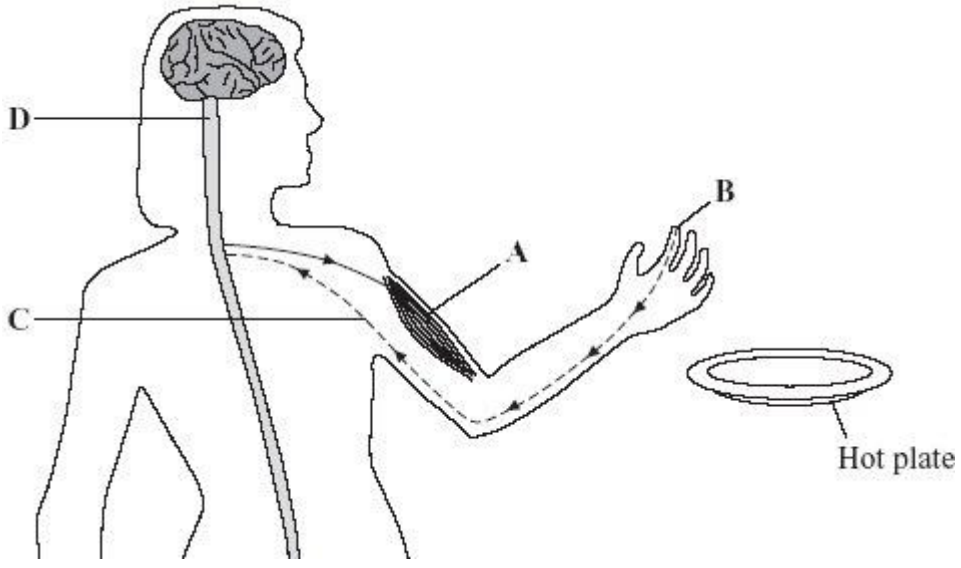
Life on Earth first developed more than three | billion / million / thousand | years ago.

Fossils | disprove / give evidence for / prove | the theory of evolution.

(2)
(Total 6 marks)

Q32. A girl picks up a hot plate. A reflex action causes her to drop it.

The diagram shows some of the structures involved in this reflex action.



Use words from the box to name the structures labelled **A**, **B**, **C** and **D**.

brain	**gland**	**muscle**	**neurone**	**receptor**	**spinal cord**

A .....

B .....

C .....

D .....

(Total 4 marks)

##

(a) Use words from the box to complete the sentences about curing disease.

antibiotics	**antibodies**	**antitoxins**	**painkillers**	**statins**

The substances made by white blood cells to kill pathogens are called.....

The substances made by white blood cells to counteract poisons produced by pathogens

are called .....

Medicines which kill bacteria are called .....

(3)

(b) The MMR vaccine protects people against three diseases.

Write down the names of **two** of these diseases.

1 .....

2 .....

(2)

(c) All vaccinations involve some risk.

The table shows the risk of developing harmful effects:

- from the disease if a child is **not** given the MMR vaccine;
- if a child **is** given the MMR vaccine.

Harmful effect	**Risk of getting the harmful effect from the disease (if not vaccinated)**	**Risk of getting the harmful effect from MMR vaccine**

Convulsions	1 in 200	1 in 1000
Meningitis	1 in 3000	Less than 1 in 1 000 000
Brain damage	1 in 8000	0

A mother is considering if she should have her child vaccinated with the MMR vaccine.

Use information from the table to persuade the mother that she should have her child vaccinated.

.....

.....

.....

.....

(2)

(d) The vaccine used to protect us from the Hepatitis B virus is produced by genetic engineering.

Yeast cells are used to produce the vaccine.

Use words from the box to complete the sentence.

chromosomes	**drugs**	**enzymes**	**genes**	**hormones**

To produce the vaccine ..... are used to cut out .....

from the Hepatitis B virus which are then inserted into the yeast cells.

(2)
(Total 9 marks)

Q34. *Obesity* is a factor that affects Coronary Heart Disease (CHD).

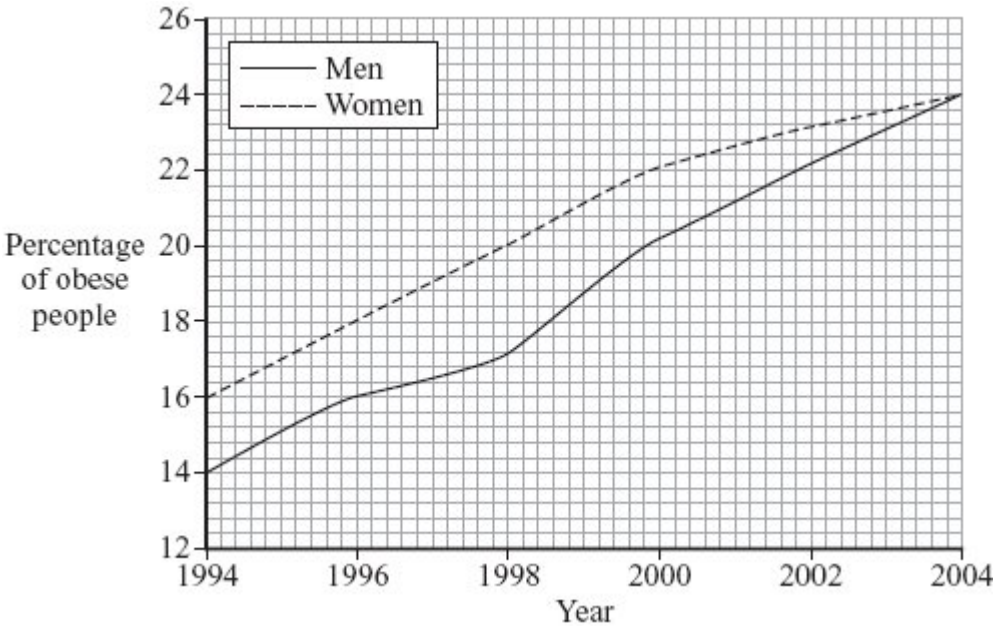
(a) What is meant by *obesity*?

.....

.....

(1)

(b) The graph shows how the percentages of obese men and women in the UK changed between 1994 and 2004.



(i) Describe how the percentage of obese women changed between 1994 and 2004.

.....

.....

.....

.....

(2)

(ii) The percentage of obese men changed between 1994 and 2004.

Suggest **two** reasons for this change.

1. .....

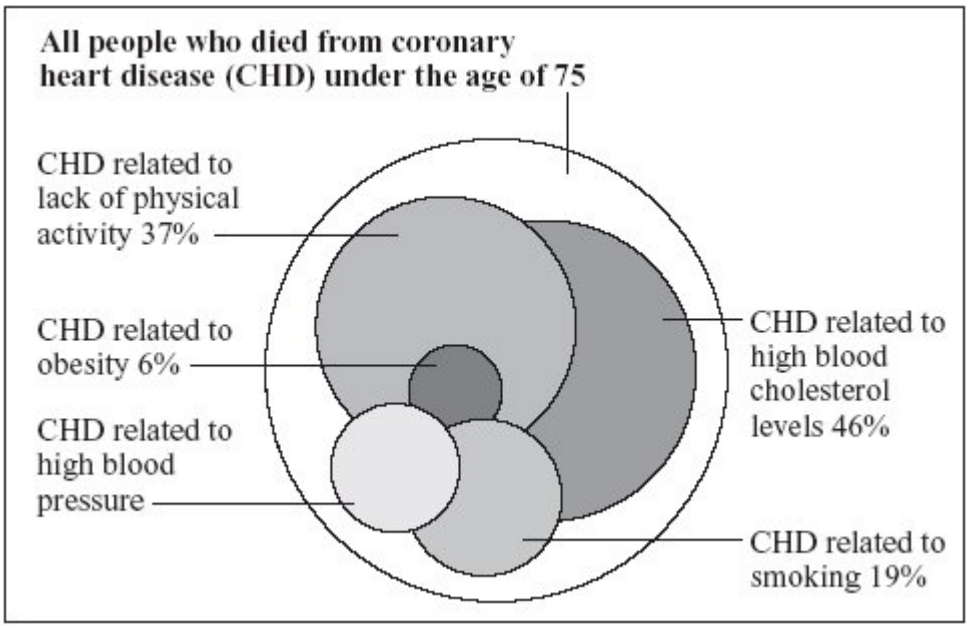
.....

2. .....

.....

(2)

(c) The chart below is published by the British Heart Foundation. It shows how death from CHD is related to a number of different factors.



copyright National Heart Forum

Each factor is represented by a circle.

The bigger the circle, the more people are affected by the factor.

(i) What is the main factor causing death from CHD?

.....

(1)

(ii) Estimate the percentage of deaths from CHD related to high blood pressure.

..... %

(1)

(iii) The data are shown as overlapping circles instead of a bar chart. The percentages of deaths related to the different factors add up to more than 100%.

What does this tell you about some of the people who died from CHD?

.....

.....

(1)

(Total 8 marks)

Q35. *Obesity* is a factor that affects Coronary Heart Disease (CHD).

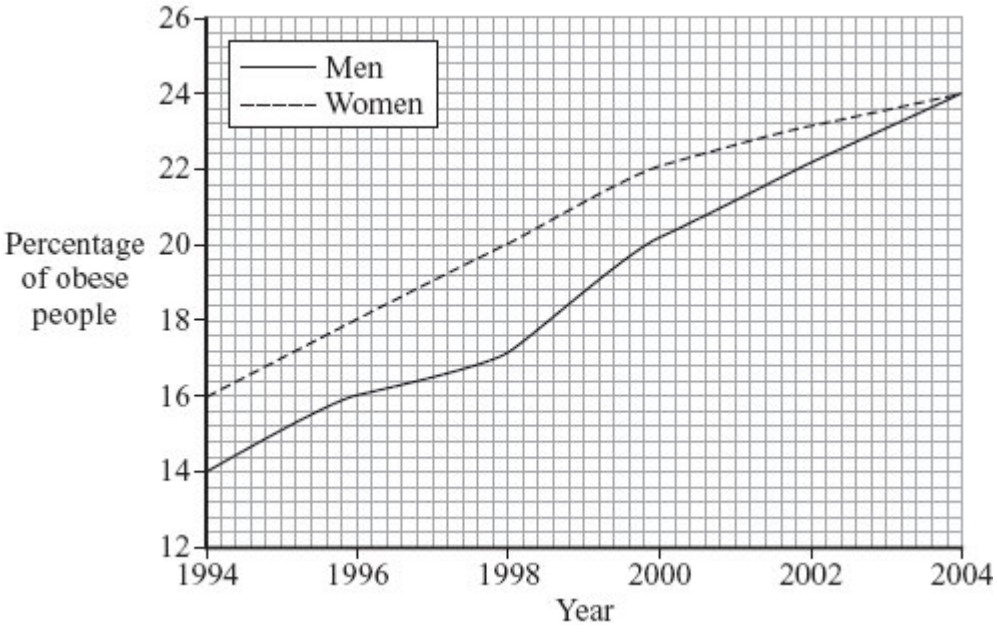
(a) What is meant by *obesity*?

.....

.....

(1)

(b) The graph shows how the percentages of obese men and women in the UK changed between 1994 and 2004.



(i) Describe how the percentage of obese women changed between 1994 and 2004.

.....

.....

.....

.....

(2)

(ii) The percentage of obese men changed between 1994 and 2004.

Suggest **two** reasons for this change.

1. .....

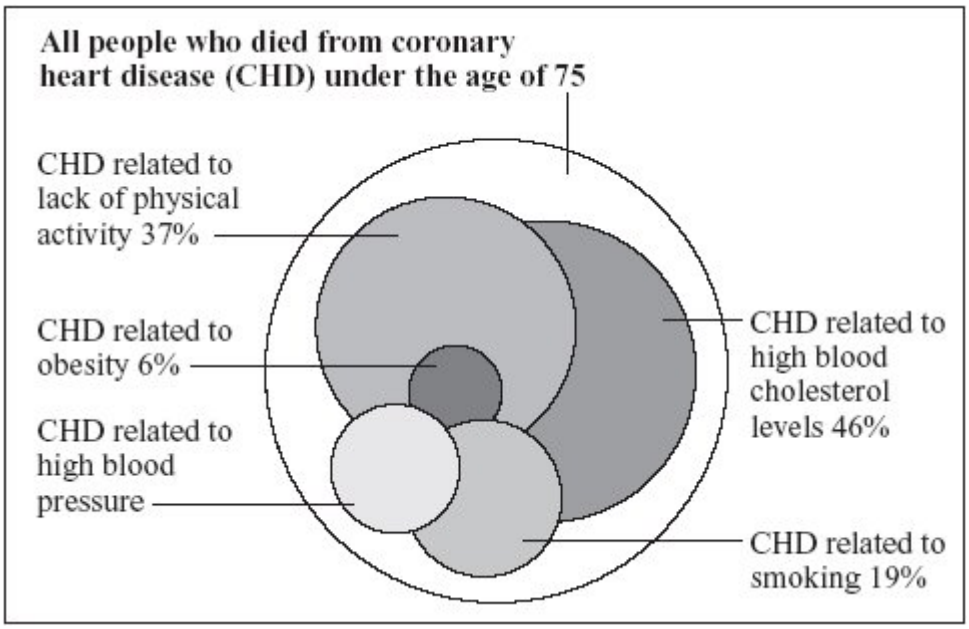
.....

2. .....

.....

(2)

(c) The chart below is published by the British Heart Foundation. It shows how death from CHD is related to a number of different factors.



copyright National Heart Forum

Each factor is represented by a circle.

The bigger the circle, the more people are affected by the factor.

(i) What is the main factor causing death from CHD?

.....

(1)

(ii) Estimate the percentage of deaths from CHD related to high blood pressure.

..... %

(1)

(iii) The data are shown as overlapping circles instead of a bar chart. The percentages of deaths related to the different factors add up to more than 100%.

What does this tell you about some of the people who died from CHD?

.....

.....

(1)

(Total 8 marks)