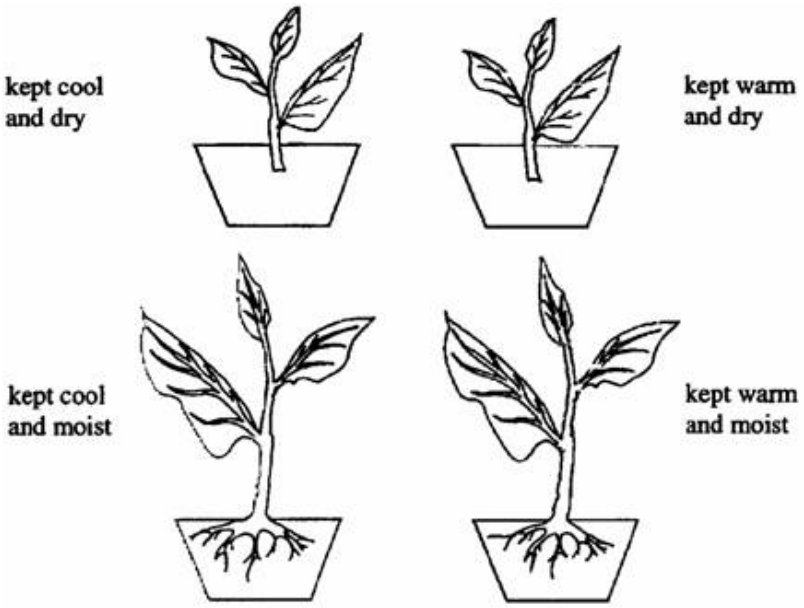
Q1. A gardener took four cuttings from the same plant and put them in compost.
He kept them in different conditions.
The diagrams show each cutting some time later.



(a) Use information from the diagrams to answer this part.

(i) The most important condition needed for cuttings to develop is that

they should be kept .....

(1)

(ii) Explain why you chose this condition.

.....

(2)

(b) Gardeners often grow new plants from cuttings instead of from seeds.
Give a reason for this.

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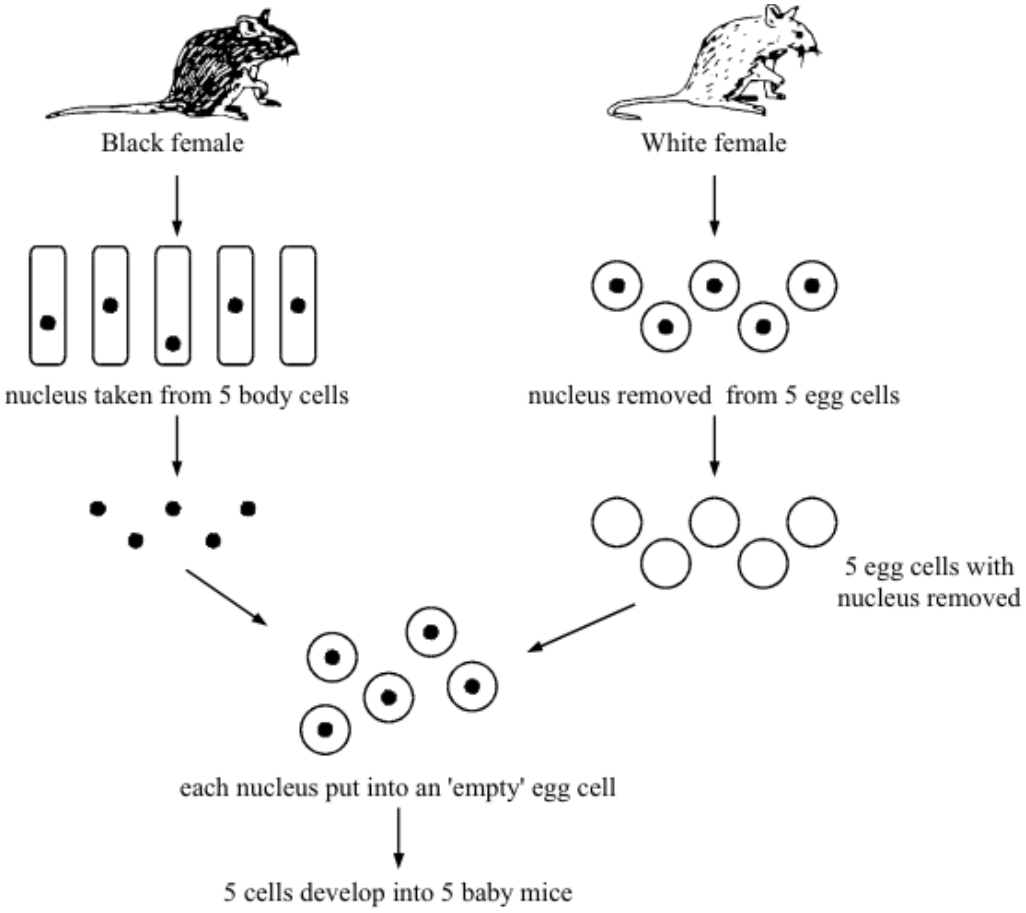
(1)
(Total 4 marks)

Q2. The diagram shows how you can breed mice without using male sex cells.



(a) (i) What type of reproduction is shown above?

.....

(1)

(ii) Which part of the nucleus carries the information to make a mouse black or white?

.....

(1)

(iii) Carefully describe how the baby mice

(A) compare with each other, ...

.....

(B) compare with the parent mice .....

.....

(3)

(b) Mice normally reproduce in a similar way to humans.

(i) Which organs in the white mouse released the five egg cells?

.....

(1)

(ii) What treatment could you give the white mouse to make her release more eggs?

.....

.....

(1)

(Total 7 marks)

Q3. Complete the sentences below.

Genes pass on ..... from parents to children.

The genes are passed on by the parents' reproductive cells.

The mothers' sex-cells are called ..... .

The fathers' sex-cells are called ..... .

Children are similar to their parents because .....

..... .

(Total 4 marks)

Q4. In some methods of reproduction, clones are made.

(a) Explain what is meant by a clone.

.....

.....

.....

.....

(2)

(b) *To gain full marks for this question you should write your ideas in good English. Put them into a sensible order and use the correct scientific words.*

Describe, in as much detail as you can, **one** way in which an embryo can be cloned.

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.....

.....

(3)

(Total 5 marks)

Q5. Read the passage about antibiotics.

People do not always agree about the use of antibiotics in food production.

If we put low doses of antibiotics in feed for animals such as cattle and sheep, it helps to produce high-quality, low-cost food. Antibiotics help to keep animals disease-free. They also help animals to grow. Animals get fatter quicker because they do not waste energy trying to overcome illness.

The use of antibiotics in livestock feed means that there is a higher risk of antibiotic-resistant bacteria developing. The rapid reproduction of bacteria means there is always a chance that a population of bacteria will develop which is antibiotic-resistant. These could be dangerous to human health.

(a) *To gain full marks for this question you should write your ideas in good English. Put them into a sensible order and use the correct scientific words.*

Explain how a population of antibiotic-resistant bacteria might develop from non-resistant bacteria.

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(3)

(b) Do you think that farmers should be allowed to put low doses of antibiotics in animal feed? Explain the reasons for your answer.

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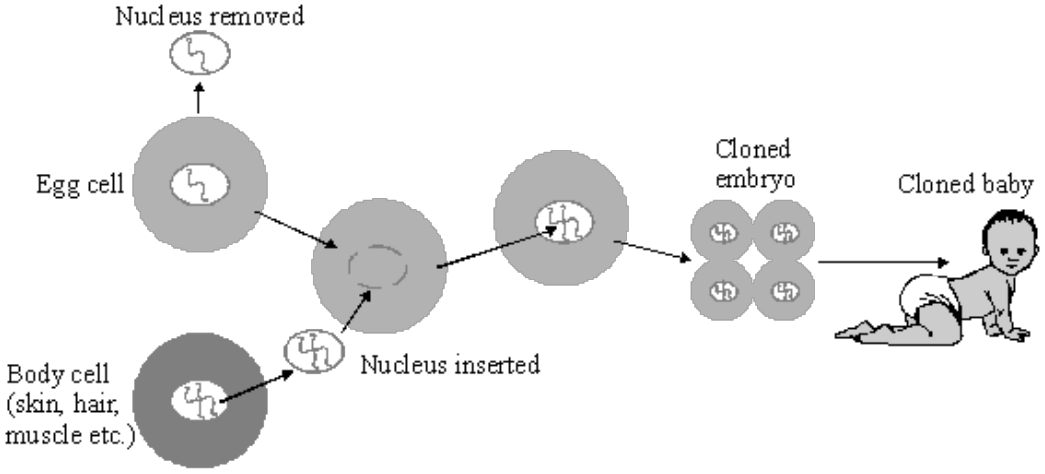
(2)

(Total 5 marks)

Q6. It is now possible to clone humans. The diagram shows one way in which this can be done.



(a) What type of reproduction is this?

.....

(1)

(b) Will the baby have the characteristics of the egg cell or the body cell?

.....

Explain the reason for your answer.

.....

.....

.....

.....

(2)

(c) The procedure in the diagram could be used to produce several cloned embryos.

Suggest how this might be done.

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.....

(1)

(Total 4 marks)

Q7. Busy lizzie plants produce flowers with many different colours.

A gardener wants to produce busy lizzie plants to fill a flower bed in her garden.
She decides to grow them from cuttings rather than seeds.

(a) Give **one** condition that she should supply to the new cuttings so that they grow well.

.....

(1)

Busy Lizzie plants can produce flowers which are white, pink or red.
A gardener wants to grow a display containing all three colours of flowers.

(b) Give **one** advantage and **one** disadvantage to the gardener of growing Busy Lizzie plants from cuttings rather than seeds.

Advantage .....

Disadvantage .....

(2)

(Total 3 marks)

Q8. A market gardener produces large numbers of attractive, large flowered geranium plants.

(a) Give two advantages to the gardener of producing geraniums from cuttings rather than from seeds.

1 .....

.....

2 .....

.....

(2)

(b) Gardeners often cover trays of cuttings with large polythene bags.

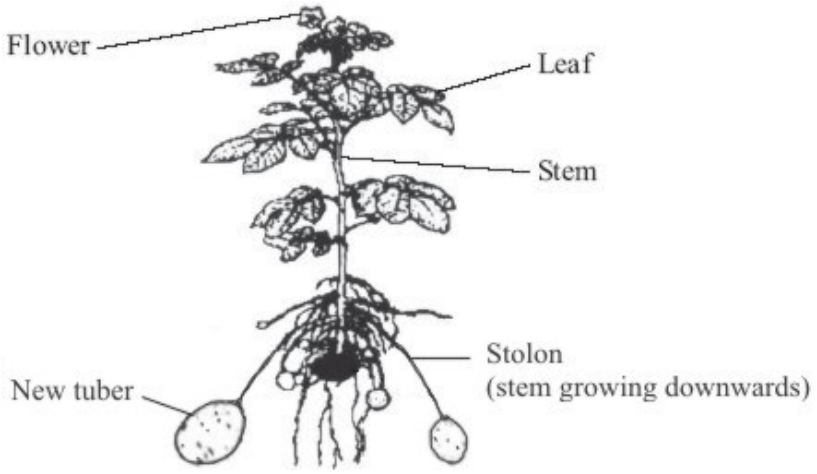
Suggest **one** advantage of this.

.....

.....

(1)
(Total 3 marks)

Q9. The drawing shows a potato plant producing new tubers (potatoes). Buds on the stem of the parent plant produce stolons. The new tubers are formed at the ends of the stolons (stems that grow downwards).



(a) Explain why the new tubers are genetically identical to each other.

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(2)

(b) Some of the tubers are used to produce potato plants. These new potato plants will not all grow to the same height.

Give **one** reason why.

.....

.....

(1)

(Total 3 marks)

Q10. The photograph shows a zorse.

By Kumana @ Wild Equines [CC-BY-2.0], via Wikimedia Commons

A zorse is a cross between a male zebra and a female horse.
The zorse has characteristics of both parents.

(a) The zorse was produced by *sexual reproduction.*

(i) What is *sexual reproduction?*

.....

.....

(1)

(ii) The zorse has characteristics of a zebra and a horse.

Why?

.....

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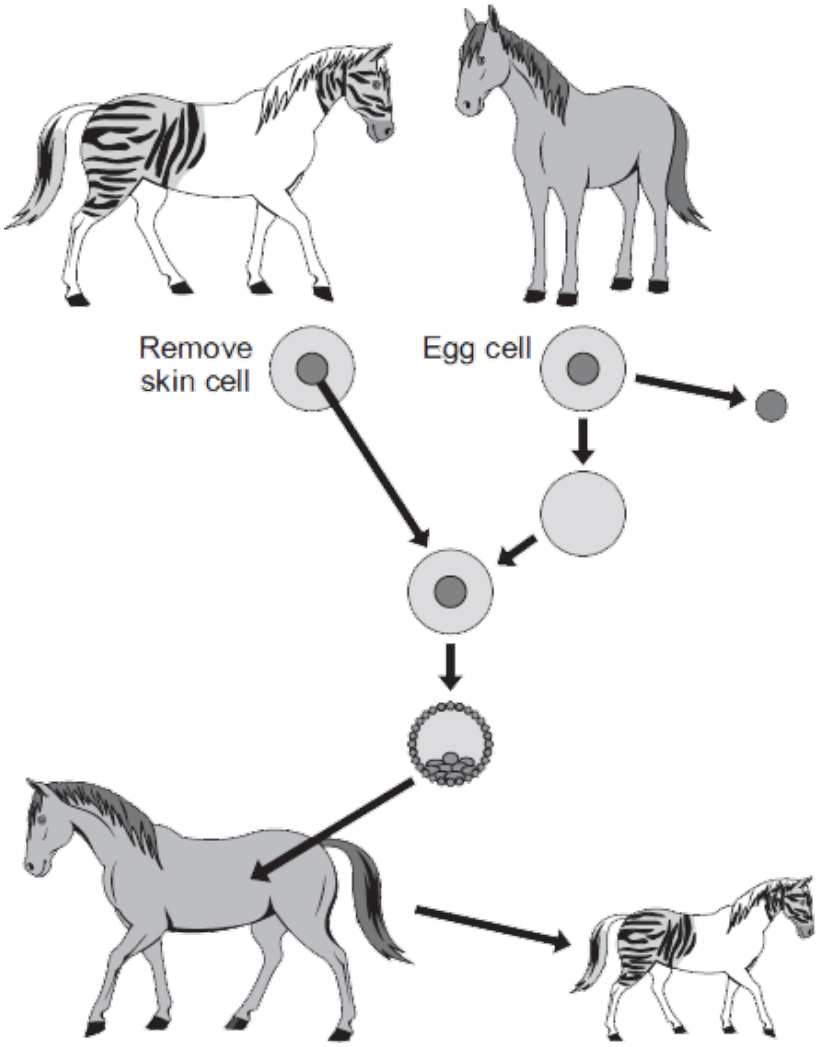
(2)

(b) Zorses are **not** able to breed.
Scientists could produce more zorses from this zorse by adult cell cloning.

The diagram shows how the scientists might clone a zorse.



In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.

Use information from the diagram and your own knowledge to describe how adult cell cloning could be used to clone a zorse.

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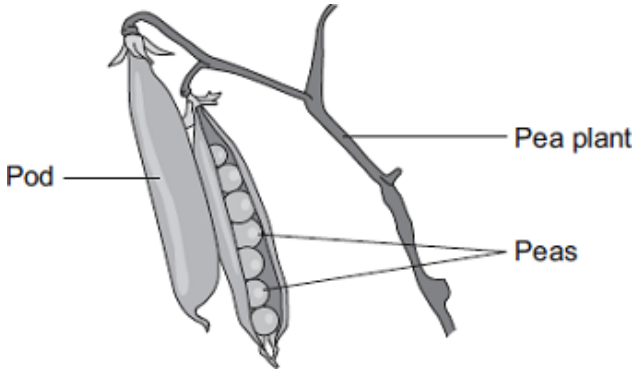
(6)
(Total 9 marks)

Q11. Peas grow in pods on pea plants.



A gardener grew four varieties of pea plants, **A** , **B** , **C** and **D** , in his garden.
The gardener counted the number of peas in each pod growing on each plant.

The table shows his results.

Variety	Range of number of peas in each pod	Mean number of peas in each pod
A	2–6	4
B	3–7	5
C	3–8	6
D	6–8	7

(a) Give **one** environmental factor and **one other** factor that might affect the number of peas in a pod.

Environmental factor.....

Other factor.....

(2)

(b) The gardener thinks that he will get the largest mass of peas from his garden if he grows variety **D**.

Why is the gardener **not** correct?

Suggest **one** reason.

.....

.....

(1)

(c) It is important that carbon is cycled through living things.

After he has picked the peas, the gardener puts the dead pea plants onto a compost heap.

Over the next few months, the carbon in the carbon compounds from the pea plants is returned to the air.

Describe how.

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(4)
(Total 7 marks)