AQA GCSE Biology | 8461

SPECIFICATION POINT 4.6.1.1

Sexual and asexual reproduction

Past-paper questions

Tier	**Higher**
Question groups	**36**
Available paper years	**2007–2025**

Using this booklet

1. Answer the questions in order and show your working.
2. Original question numbers and marks are retained.
3. Print at actual size (100%) for measuring questions.
4. Use the companion answer booklet to check your work.

Name: _____ **Date:** _____

Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

4.6.1.1 Sexual and asexual reproduction

Question 01

January 2007 | BLY1H | Original Q7 | Legacy

7 Read the passage about IVF (in-vitro fertilisation) and embryo-splitting.

> "IVF is not as successful as we would like it," says scientist Michael Tucker. "On average, only one in five or one in six of all the embryos that we generate in the IVF lab will develop as far as full-term delivery as a baby."
>
> "There is a way to perhaps double those odds. A new, identical embryo is split off from the original embryo made in the IVF lab."
>
> "What we are really doing is creating an identical twin," says scientist Dr Hilton Kort.
>
> "And that's what happens in nature every day. Cloning is creating a replica of a person or an animal."

(a) Explain why the two embryos will develop into identical twins.

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(2 marks)

(b) Explain why the embryos are **not** clones of their parents.

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(2 marks)

(c) The scientists want to develop this technique, but are afraid to do so because public opinion might be against the technique.

Suggest an explanation for this.

.....

.....

(1 mark)

5

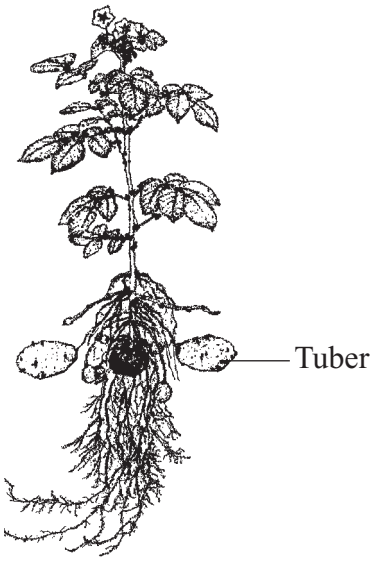
4.6.1.1 Sexual and asexual reproduction

Question 02

March 2007 | BLY1B | Original Q4 | Legacy

QUESTION FOUR

The diagram shows a potato plant.



Potato tubers are produced by cell division. Potato plants can reproduce sexually and asexually.

The tubers can be removed and replanted. This produces more potato plants of the same type.

The masses of the tubers of 15 potato plants of the same type were measured using an electronic balance. The results are shown in the table.

Plant number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Mass of tubers in kg	2.5	1.7	2.3	4.1	2.2	1.9	2.5	3.8	4.6	1.9	3.6	1.3	2.5	2.9	1.2

4A What was the range of the mass of the tubers on the potato plants?

1 1.2 – 2.5 kg

2 1.2 – 4.6 kg

3 1.3 – 4.6 kg

4 1 – 15 kg

4.6.1.1 Sexual and asexual reproduction

Question 02 · continued

4B The sensitivity of the balance is . . .

1 0.001 kg

2 0.01 kg

3 0.1 kg

4 1.0 kg

4C Which of the following is **not** a possible reason for the difference in mass of the tubers produced by the potato plants?

1 Some of the plants were growing in the shade.

2 The plants received different amounts of nutrients.

3 The tubers were produced by sexual reproduction.

4 The plants were watered at different time intervals.

4D A plant nursery wants to produce large numbers of young plants quickly and cheaply.

Which technique would be used?

1 growing the seeds produced by sexual reproduction

2 taking cuttings

3 transplanting embryo plants to other plants

4 using genetic engineering

4.6.1.1 Sexual and asexual reproduction

Question 03

November 2008 | BLY1AP | Original Q9 | Legacy

QUESTION NINE

This question is about hormones.

9A Which row in the table shows the sites of production of FSH, LH and oestrogen?

	FSH	LH	Oestrogen
1	pituitary gland	ovary	ovary
2	pituitary gland	ovary	pituitary gland
3	ovary	pituitary gland	pituitary gland
4	pituitary gland	pituitary gland	ovary

9B Which row in the table shows the effect of oestrogen on the production of FSH and LH?

	FSH production	LH production
1	stimulated	inhibited
2	inhibited	inhibited
3	stimulated	stimulated
4	inhibited	stimulated

9C IVF (in vitro fertilisation) treatment can be used to help childless couples have children.

This treatment usually involves giving the woman . . .

1 FSH only.

2 FSH and LH.

3 oestrogen and FSH.

4 oestrogen and LH.

4.6.1.1 Sexual and asexual reproduction

9D Hormones are used during IVF treatment.

Which of the following is an ethical issue associated with IVF treatment?

1 Children born following IVF treatment will not have a father.

2 There may be more embryos produced than can be used.

3 The mother may produce many eggs during the treatment.

4 The mother will not be able to have more than one child.

END OF TEST

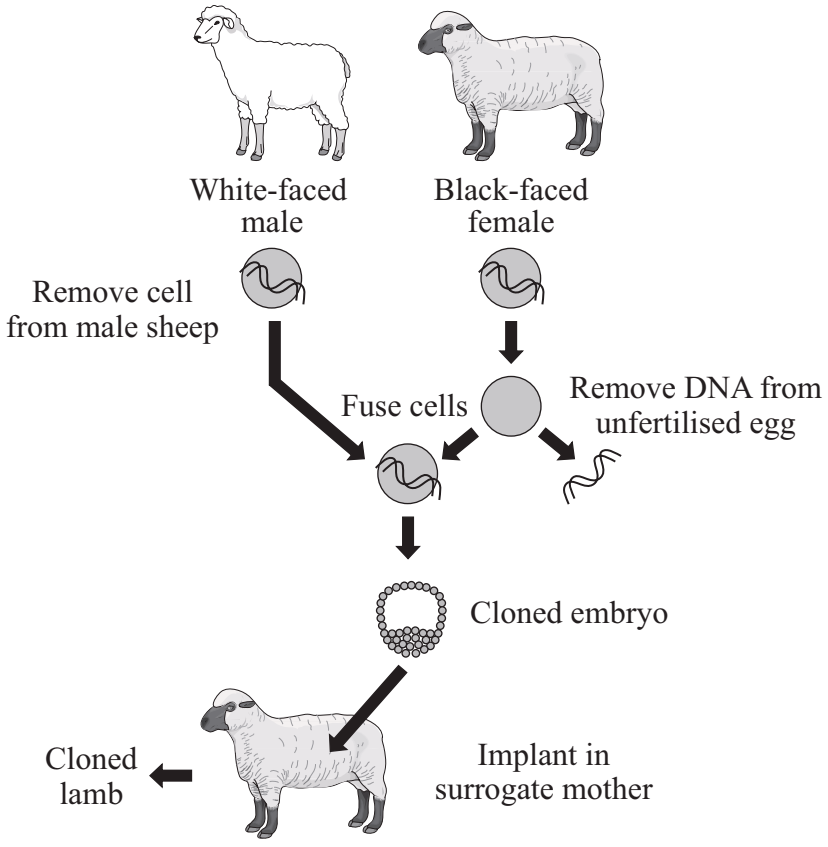
4.6.1.1 Sexual and asexual reproduction

Question 04

November 2008 | BLY1BP | Original Q8 | Legacy

QUESTION EIGHT

The diagram shows the method used to clone sheep.



8A This method of cloning sheep involves . . .

1 fertilisation of an egg by a sperm.

2 sexual reproduction.

3 asexual reproduction.

4 fusion of male and female gametes.

8B The clone produced would be . . .

1 a black-faced male.

2 a white-faced female.

3 a black-faced female.

4 a white-faced male.

4.6.1.1 Sexual and asexual reproduction

Question 04 · continued

8C Proposals have been made to clone human embryos.

Which of the following is a reason why cloning human embryos might be allowed?

1 The cloned embryos could be used to create a 'super-race'.

2 The embryos could be stored for long periods.

3 Cloning will produce surplus embryos.

4 Cells from the embryos could be used to cure human diseases.

8D Clones are produced naturally when . . .

1 two eggs are fertilised.

2 two eggs are fertilised by two separate sperm.

3 one egg is fertilised by one sperm and the embryo splits into two.

4 two eggs are fertilised by one sperm and the embryo splits into two.

4.6.1.1 Sexual and asexual reproduction

Question 05

November 2008 | BLY1BP | Original Q9 | Legacy

QUESTION NINE

Diagram 1 shows a snake with a poisonous bite.
Diagram 2 shows a snake with a non-poisonous bite.
The two snakes live in the same area.

Diagram 1



Diagram 2



9A Changes in the body patterns of snakes are caused by . . .

1 changes to their habitat.

2 changes to their genes.

3 changes to their predators.

4 changes to their characteristics.

9B The most likely explanation for the similarity in appearance of the non-poisonous snakes to the poisonous snakes is that . . .

1 the poisonous snakes breed with the non-poisonous snakes.

2 the non-poisonous snakes copy the poisonous snakes.

3 the non-poisonous snakes, similar to poisonous ones, are more likely to survive.

4 the poisonous snakes have evolved a defence against predators.

9C Extinction of both poisonous and non-poisonous snakes could be caused by . . .

1 a new predator evolving.

2 the non-poisonous snakes becoming different in appearance from the poisonous ones.

3 competition between predators of the non-poisonous snakes.

4 a scarcity of food in their habitat.

4.6.1.1 Sexual and asexual reproduction

9D Some species of snake reproduce by parthenogenesis, which is the development of unfertilised eggs into adults.

In parthenogenesis . . .

1 no gametes are produced.

2 there is no mixing of genetic information.

3 there is great genetic variation between the offspring.

4 there are no chromosomes involved.

END OF TEST

4.6.1.1 Sexual and asexual reproduction

Question 06

March 2009 | BLY1AP | Original Q9 | Legacy

QUESTION NINE

In vitro fertilisation (IVF) is used to help women who have difficulty conceiving.

9A Which hormone treatment is given to a woman during IVF?

1 FSH is given to stimulate eggs to mature.

2 LH is given to stimulate eggs to mature.

3 Oestrogen is given to stimulate the thickening of the lining of the womb.

4 FSH is given to stimulate the release of eggs.

9B Which statement correctly describes one stage in IVF treatment?

1 Sperm cells are inserted into the mother's womb when eggs are released from the ovary.

2 Fertilised eggs develop into embryos outside the mother's body.

3 Eggs are collected from the mother after every menstrual period.

4 Fertilisation takes place inside the woman's body.

The table shows the effectiveness of IVF treatment in a fertility clinic in 2004 and 2005.

	2004				**2005**			
Age of woman	Under 35	35–37	38–40	Over 40	Under 35	35–37	38–40	Over 40
Number of IVF treatments	130	100	29	20	142	62	33	11
Average number of embryos transferred	2.6	2.8	3.3	3.6	2.5	2.8	3.0	3.2
Percentage of successful pregnancies	43	30	21	13	43	48	30	27

Question 06 · continued

9C What conclusion can be drawn from the data?

1 The more embryos transferred, the greater the chance of a successful pregnancy.

2 There were more multiple births in 2005 than in 2004.

3 Older women are less likely to have a successful pregnancy by IVF.

4 More women were given IVF treatment in 2005 than in 2004.

9D Many people oppose the use of IVF.

What information from the table could be used by people campaigning against IVF on ethical grounds?

1 A high proportion of women in the country are being treated with IVF.

2 High doses of hormones cause side effects in many women.

3 Many embryos die in IVF treatment.

4 IVF treatment is too expensive for most women.

END OF TEST

4.6.1.1 Sexual and asexual reproduction

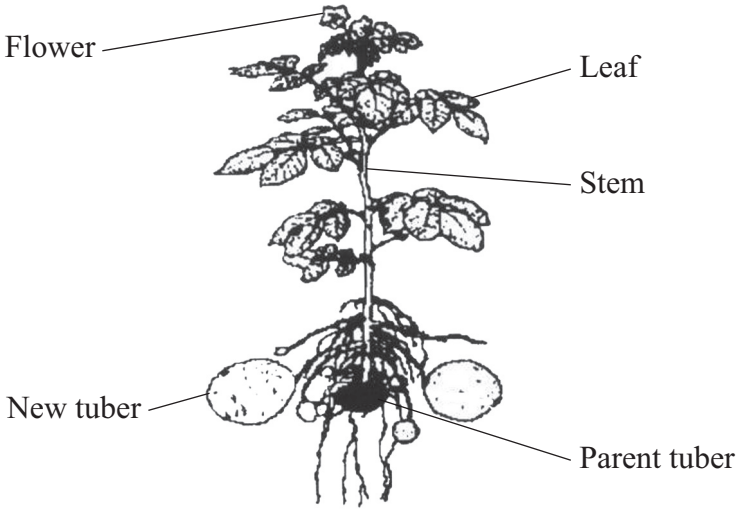
Question 07

March 2009 | BLY1BP | Original Q7 | Legacy

QUESTION SEVEN

There are many varieties of potato plant, producing tubers with different qualities.

Potato plants can reproduce both sexually and asexually.



7A How could new varieties of potato be produced?

1 taking small groups of cells from a new tuber and growing them

2 taking cuttings from the leaf or stem of the plant and growing them

3 allowing gametes from different potato plants to fuse together

4 allowing new tubers to stay in the ground and to grow next year

7B Scientists wish to create a variety of potato which will tolerate drought conditions.
They have identified the gene which gives a cactus species the ability to survive with very little water.

What would be the best way of producing drought-resistant potatoes?

1 breed ordinary potato plants with cactus plants

2 use enzymes to cut out the gene from the cactus and transfer it to potato cells

3 selectively breed cactus plants which, over many generations, are more like potatoes

4 grow potato plants in low water conditions over many generations

4.6.1.1 Sexual and asexual reproduction

Question 07 · continued March 2009 | BLY1BP | Original Q7 | Legacy

7C Some people believe that using genetic engineering to develop potatoes that are tolerant to drought conditions should **not** be allowed.

One reason for this is because . . .

1 the new variety of potato may be susceptible to the same diseases as cactus plants.

2 the cost of the technology required outweighs the possible profits.

3 the native potato may compete with the new variety.

4 there are ethical concerns about interfering with natural processes.

7D Herbicide-resistant potatoes have also been produced.

The advantage of this is that . . .

1 old potato plants can easily be killed to make way for new crops.

2 it is easy to kill insects which might feed on the crop.

3 the growth of wild flowers is encouraged, maintaining biodiversity.

4 competition from other plants can be reduced.

4.6.1.1 Sexual and asexual reproduction

Question 08

March 2009 | BLY1BP | Original Q9 | Legacy

QUESTION NINE

There are several theories for the way in which evolution may have happened.

9A Lamarck's theory of evolution was based on the idea that . . .

1 organisms pass on the advantages that they acquire during their lifetime.

2 organisms acquire genes from their parents which may give them advantages.

3 the characteristics that organisms have are controlled by God.

4 offspring have a mixture of their parents' features.

9B In the 1860s there was much opposition to Darwin's theory of evolution.

Which of the following was **not** a reason for this opposition?

1 The theory conflicted with deeply held religious views.

2 Darwin did **not** have sufficient evidence to support his ideas.

3 Darwin was unable to make his ideas known to other scientists.

4 Nobody knew how inheritance worked.

9C When a new island is formed by volcanic action, the environment continues to undergo rapid change for many years. At first there will be no living things present.

A plant seed may be blown to the island by the wind. When this seed begins to grow, the plant may reproduce asexually.

What is the disadvantage of asexual reproduction to the plant species in this case?

1 Only one individual is needed for reproduction.

2 All the offspring will be genetically identical.

3 New plants will be produced quickly.

4 Dense groups of this species will reduce competition from other species.

4.6.1.1 Sexual and asexual reproduction

9D Darwin's theory of evolution through natural selection was based on a number of events.

These events are outlined below.

- **P** Those individuals which are most suited to the environment survive.
- **Q** There is an increase in variation between members of the species.
- **R** Genes that improve survival chances are passed on to the next generation.
- **S** Mutation results in new forms of genes.

Which is the correct sequence for these events?

1 **P → R → S → Q**

2 **Q → R → P → S**

3 **S → Q → P → R**

4 **R → S → Q → P**

END OF TEST

4.6.1.1 Sexual and asexual reproduction

Question 09

June 2009 | BLY1H | Original Q7 | Legacy

7 Two types of fertility treatment are in-vitro fertilisation (IVF) and in-vitro maturation (IVM).

7 (a) Describe the role of hormones in IVF treatment.

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(3 marks)

(Extra space) .....

.....

7 (b) Read the passage about fertility treatment.

During normal IVF, a woman undergoes several weeks of hormone injections. The treatment can lead to a condition called ovarian hyperstimulation syndrome resulting in a build-up of fluid in the lungs. Very rarely, it can cause death. The syndrome occurs in about 1 % of standard IVF cycles, but in about 10 % of the IVF cycles of some women. An IVF cycle may cost up to £4300.

In IVM, hormone treatment lasts for less than 7 days. Eggs are then collected from the ovaries while they are still immature. Each egg is then matured in a laboratory for up to 48 hours before being injected with a single sperm. A few days after fertilisation, the embryos are implanted into the mother's womb. The cost of each IVM cycle is £1700.

An IVM expert says: "In IVM treatment there's a small risk of abnormalities in the sex chromosomes and also of birth deformities and cancer in the babies. These risks are not massive but they are greater than in IVF."

4.6.1.1 Sexual and asexual reproduction

Question 09 · continued

for mark

7 (b) Evaluate the use of IVM rather than IVF in treating infertility.

Remember to give a conclusion to your evaluation.

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(4 marks)

(Extra space) .....

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7

4.6.1.1 Sexual and asexual reproduction

Question 10

March 2010 | BLY1AP | Original Q7 | Legacy

QUESTION SEVEN

The success of in vitro fertilisation (IVF) treatment depends on several factors.

7A During IVF, a woman is usually treated with . . .

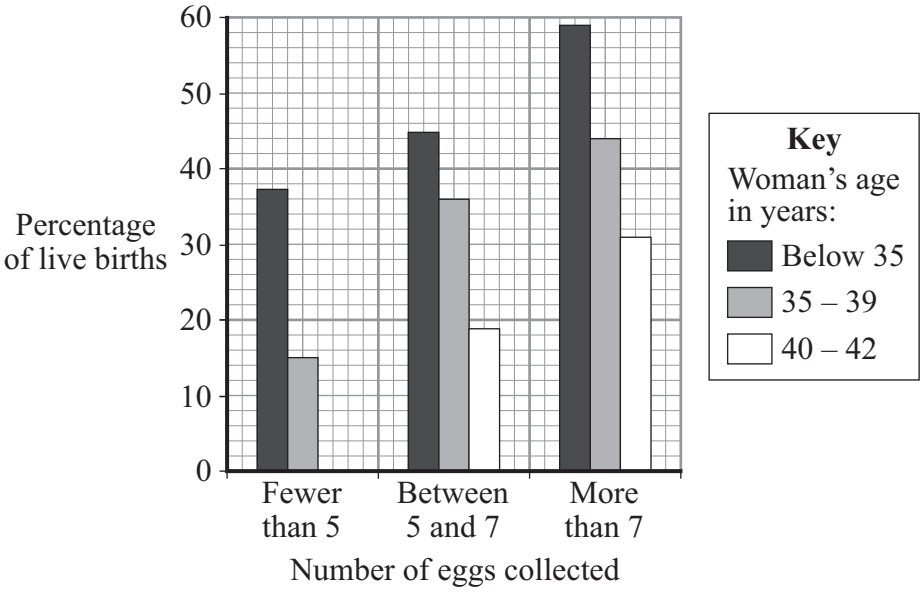
1 FSH only.

2 FSH and LH.

3 oestrogen.

4 LH and oestrogen.

The bar chart shows how a woman's age and the number of eggs collected from her affect the percentage of live births.



7B The highest IVF success rate occurs with women aged . . .

1 below 35.

2 35–39.

3 40–42.

4 over 42.

4.6.1.1 Sexual and asexual reproduction

Question 10 · continued March 2010 | BLY1AP | Original Q7 | Legacy

7C Which conclusion can be drawn from the data in the bar chart?

1 The number of eggs collected is directly proportional to the age of the woman.

2 Collecting more than seven eggs for fertilisation is certain to lead to a successful pregnancy.

3 Women aged over 42 cannot become pregnant by IVF treatment.

4 At least five eggs must be collected from a woman between 40 and 42 years old for her to have a chance of a live birth.

7D An IVF procedure may result in the production of 'spare' fertilised eggs.

Which one of the following can be decided using only scientific considerations?

1 whether spare eggs should be sold to another clinic

2 whether to destroy the spare eggs

3 how best to store the spare eggs if required

4 whether to give the spare eggs to another woman needing IVF treatment

4.6.1.1 Sexual and asexual reproduction

Question 11

March 2010 | BLY1BP | Original Q1 | Legacy

QUESTION ONE

Tasmanian tigers are similar to Tasmanian devils. Tasmanian tigers became extinct in the 20th century.

The picture shows a Tasmanian tiger.



Scientists are trying to create living Tasmanian tigers. They are using cells from the well-preserved remains of a pregnant Tasmanian tiger. They are trying several methods.

4.6.1.1 Sexual and asexual reproduction

Question 11 · continued

Match methods, **A**, **B**, **C** and **D**, with the descriptions **1–4** in the table.

A sexual reproduction

B tissue culture

C embryo transplants

D adult cell cloning

	Description
1	Splitting cells from the Tasmanian tiger embryo and transplanting them into the womb of a Tasmanian devil.
2	Joining female gametes from the Tasmanian tiger with male sperm cells from a Tasmanian devil.
3	Growing small groups of cells in a special nutrient solution.
4	Transferring the nucleus from a Tasmanian tiger skin cell into a Tasmanian devil egg cell. After the cell is given an electric shock, it is transferred to the womb of a female Tasmanian devil.

4.6.1.1 Sexual and asexual reproduction

Question 12

June 2010 | BLY1AP | Original Q9 | Legacy

QUESTION NINE

IVF (in vitro fertilisation) treatment helps women to become pregnant.

9A The hormone which stimulates the monthly release of the egg is secreted by the . . .

1 ovary.

2 brain.

3 pituitary gland.

4 womb.

9B Which hormone treatment is usually used in IVF?

1 oestrogen only

2 FSH followed by LH

3 FSH only

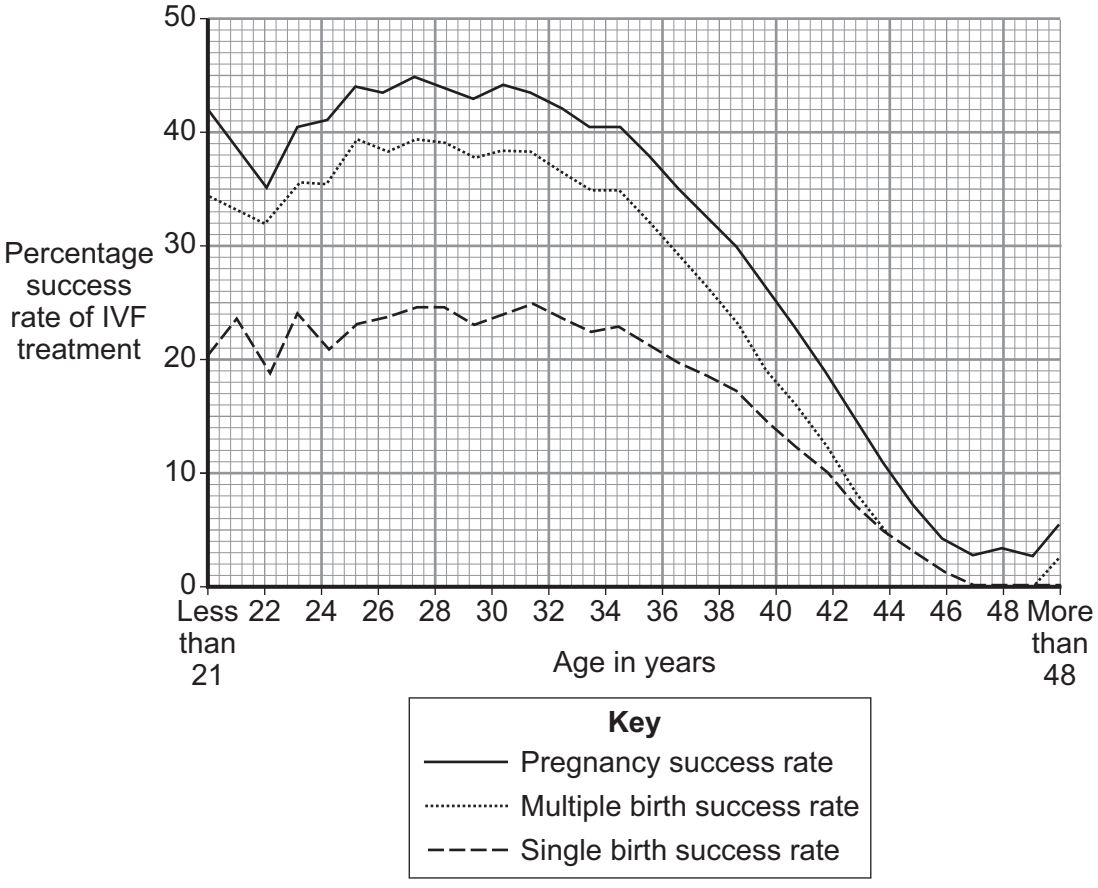
4 LH followed by FSH

4.6.1.1 Sexual and asexual reproduction

Question 12 · continued

June 2010 | BLY1AP | Original Q9 | Legacy

The graph shows the percentage success rates of IVF treatments for women of different ages.



9C Which conclusion can be drawn from this data?

1 Only single babies were born to women over 45.

2 IVF should not be given to women over 45.

3 The pregnancy success rate falls significantly after the age of 34.

4 The pregnancy success rate is independent of the age of the woman.

9D Which pattern is shown by the data?

1 The single birth success rate is always less than the multiple birth success rate.

2 The multiple birth success rate is never less than 20%.

3 Women of all ages produce multiple births.

4 After the age of 34 the proportion of multiple births compared with single births decreases with the age of the mother.

END OF TEST

4.6.1.1 Sexual and asexual reproduction

Question 13

January 2011 | BLY1H | Original Q3 | Legacy

3 In-vitro fertilisation (IVF) is used to help some women get pregnant.

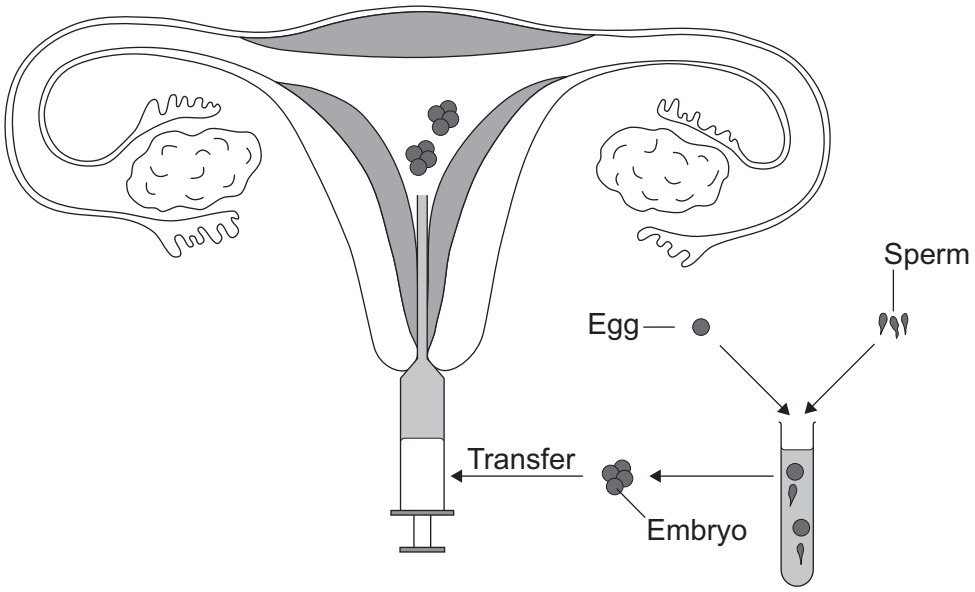
3 (a) Name the **two** hormones used in IVF treatment.

1 .....

2 .....

(2 marks)

3 (b) The diagram shows the process of IVF.



Describe the process of IVF. Use information from the diagram to help you.

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(4 marks)

6

4.6.1.1 Sexual and asexual reproduction

Question 14

March 2011 | BLY1AP | Original Q9 | Legacy

QUESTION NINE

There are several ways of helping infertile women to become pregnant.

These include:

- IVF (in vitro fertilisation)
- FET – implanting frozen embryos from previous IVF treatments into the womb
- COH/IUI – treating the woman with 'fertility drugs' to release several eggs, then introducing sperm into the womb.

9A What is the main difference between COH/IUI and IVF?

1 Fertilisation takes place inside the woman in COH/IUI.

2 'Fertility drugs' are not used in IVF.

3 Sperm are not used in IVF.

4 Embryos are not formed in COH/IUI.

9B Which hormones are normally used as 'fertility drugs'?

1 FSH only

2 FSH and oestrogen

3 FSH and LH

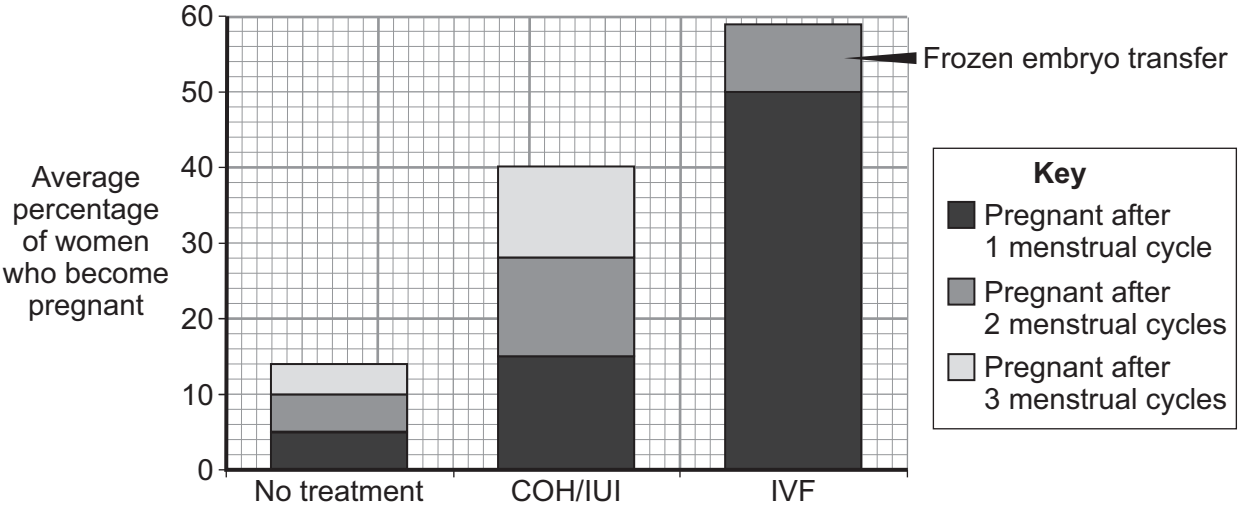
4 LH and oestrogen

4.6.1.1 Sexual and asexual reproduction

Question 14 · continued

March 2011 | BLY1AP | Original Q9 | Legacy

The graph shows the average percentage of women who become pregnant after one, two and three menstrual cycles.



9C IVF treatment increases the chance of getting pregnant after one menstrual cycle.

By how much does IVF treatment increase the chance?

1 4 times

2 5 times

3 10 times

4 60 times

9D What is the most likely reason for the higher success rate of IVF over COH/IUI?

1 More 'fertility drugs' are used in IVF.

2 Doctors can select the best embryos to use.

3 More eggs are produced in IVF.

4 Doctors can examine the sperm before they are used.

END OF TEST

4.6.1.1 Sexual and asexual reproduction

Question 15

March 2011 | BLY1BP | Original Q1 | Legacy

QUESTION ONE

We can now produce animals and plants with characteristics we prefer.

Match words, **A**, **B**, **C** and **D**, with the statements **1**–**4** in the table.

A embryo transplants

B sexual reproduction

C taking cuttings

D tissue culture

1	a quick and cheap way of reproducing a plant
2	produces clones of an animal
3	produces offspring using small groups of cells from a plant
4	produces offspring with a variety of different characteristics

4.6.1.1 Sexual and asexual reproduction

Question 16

June 2011 | BLY1H | Original Q7 | Legacy

7 Organisms can be produced by asexual reproduction and by sexual reproduction.

7 (a) Give **two** differences between asexual reproduction and sexual reproduction.

1 .....

.....

2 .....

.....

(2 marks)

7 (b) Adult cell cloning is a type of asexual reproduction.

Explain why.

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(2 marks)

4

4.6.1.1 Sexual and asexual reproduction

Question 17

November 2011 | BLY1AP | Original Q7 | Legacy

QUESTION SEVEN

In vitro fertilisation (IVF) is used to treat infertility.

7A IVF involves using . . .

1 FSH to stimulate the maturation of eggs and LH to stimulate egg release.

2 LH to stimulate the maturation of eggs and FSH to stimulate egg release.

3 FSH to stimulate the maturation of eggs and oestrogen to stimulate egg release.

4 LH to stimulate the maturation of eggs and oestrogen to stimulate egg release.

The table shows the percentage success rate of fertility treatment and the percentage of multiple births in relation to the age of the woman.

	Age of woman				
	Younger than 35	35–37	38–39	40–42	42+
Percentage of fertility treatments resulting in live births	28.2	23.6	18.3	10.6	3.2
Multiple births as a percentage of these live births	28.4	23.1	18.5	12.4	3.7

7B 16 000 women aged below 35 were given fertility treatment.

How many multiple births were recorded from these women?

1 451

2 454

3 1281

4 4512

7C The evidence in the table is from survey results from 85 clinics from all over England.

The evidence should be given as results from individual clinics because . . .

1 individual clinics may not have recorded some of their failures.

2 it is important to identify the more successful clinics.

3 older people tend to have fewer multiple births.

4 the success rate falls with increased age of the mother.

4.6.1.1 Sexual and asexual reproduction

7D The National Institute for Clinical Excellence has suggested rules for deciding who should be allowed fertility treatment.

Which of the following is an acceptable reason to refuse a woman fertility treatment?

1 The couple have been trying to start a family for only three years.

2 The woman has already had one unsuccessful attempt at treatment.

3 The woman is 48 years old.

4 The couple are not married.

Turn over for the next question

4.6.1.1 Sexual and asexual reproduction

Question 18

November 2011 | BLY1BP | Original Q1 | Legacy

QUESTION ONE

We can now produce animals and plants with the characteristics we want.

Match words, **A**, **B**, **C** and **D**, with the statements **1**–**4** in the table.

A adult cell cloning

B sexual reproduction

C taking cuttings

D tissue culture

	Information
1	used by gardeners to produce clones of a plant
2	the joining of one egg with one sperm
3	enables hundreds of identical individuals to be produced from a few cells from the parent
4	placing a nucleus from a skin cell into an egg cell with no nucleus

4.6.1.1 Sexual and asexual reproduction

Question 19

November 2011 | BLY1BP | Original Q6 | Legacy

QUESTION SIX

In the past, prize bulls used to be transported around the world to mate with cows.
Cattle embryos can now be transported around the world in test tubes.

There are two methods of doing this.

Method 1

- A cow is given drugs that cause her to produce up to 80 eggs at the same time.
- The eggs are fertilised and the resulting embryos removed from the womb.
- The embryos are frozen and sent to other farms around the world.
- Each embryo can then be put into the womb of a different cow.

Method 2

- After fertilisation, one embryo is removed from a cow.
- The embryo is split into several parts.
- The parts are frozen, then sent to other farms around the world.
- Each part can be put into the womb of a cow.

6A Which row in the table describes the calves produced using the two methods?

	Method 1		Method 2	
	Genetically identical	Genetically different	Genetically identical	Genetically different
1	✓		✓	
2		✓		✓
3	✓			✓
4		✓	✓	

6B Which method of reproduction is involved in producing the embryos formed in **Method 1**?

1 embryo splitting

2 genetic modification

3 sexual reproduction

4 tissue culture

4.6.1.1 Sexual and asexual reproduction

Question 19 · continued

6C One advantage of the new methods of producing calves rather than by mating cows with a bull is that . . .

1 the calves will all be male.

2 there is no need for a bull.

3 there is more variation between calves.

4 greater numbers of offspring of the bull are produced.

6D One advantage of adult cell cloning over **Method 2** is that the characteristics of the calves . . .

1 are known before.

2 will all be different.

3 will all be the same.

4 can be changed.

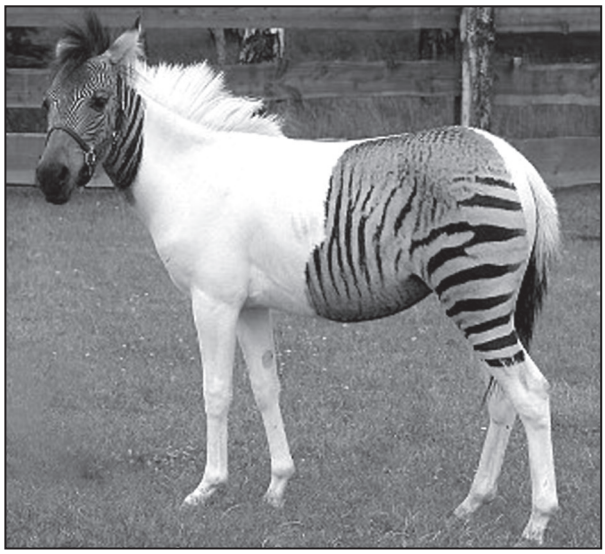
Turn over for the next question

4.6.1.1 Sexual and asexual reproduction

Question 20

January 2012 | BL1HP | Original Q1 | Legacy

1 The photograph shows a zorse.



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

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

1 (a) (i) What is *sexual reproduction*?

.....

.....

(1 mark)

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

Why?

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(2 marks)

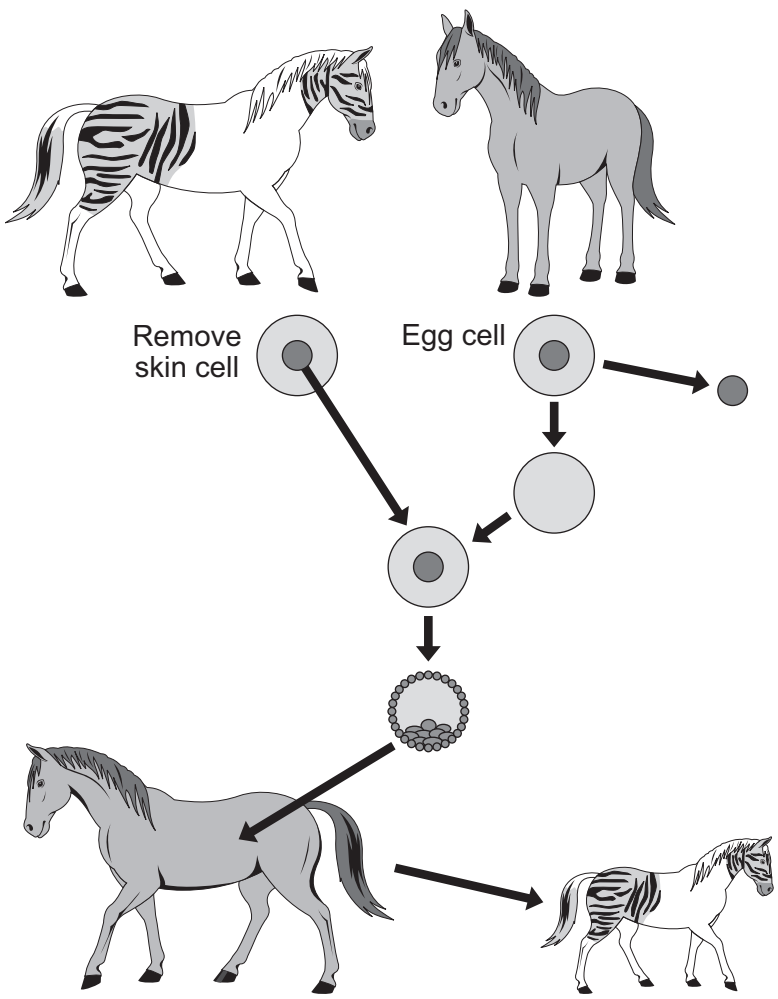
Question 1 continues on the next page

4.6.1.1 Sexual and asexual reproduction

Question 20 · continued

1 (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.



4.6.1.1 Sexual and asexual reproduction

Question 20 · continued

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 marks)

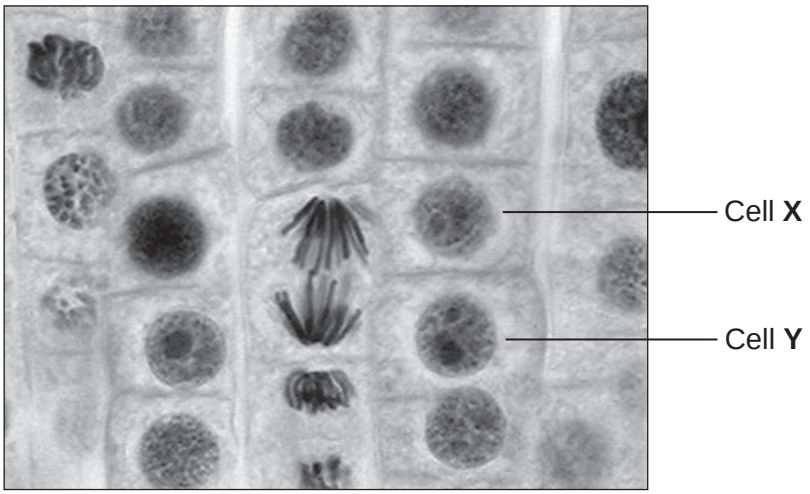
9

4.6.1.1 Sexual and asexual reproduction

Question 21

June 2012 | BL2HP | Original Q4 | Legacy

4 The photograph shows some cells in the root of an onion plant.



Photograph: © Karen Wynne, Tyler Junior College

4 (a) Cells **X** and **Y** have just been produced by cell division.

4 (a) (i) Name the type of cell division that produced cells **X** and **Y**.

.....

(1 mark)

4 (a) (ii) What happens to the genetic material before the cell divides?

.....

(1 mark)

4 (b) A gardener wanted to produce a new variety of onion.

Explain why sexual reproduction could produce a new variety of onion.

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(3 marks)

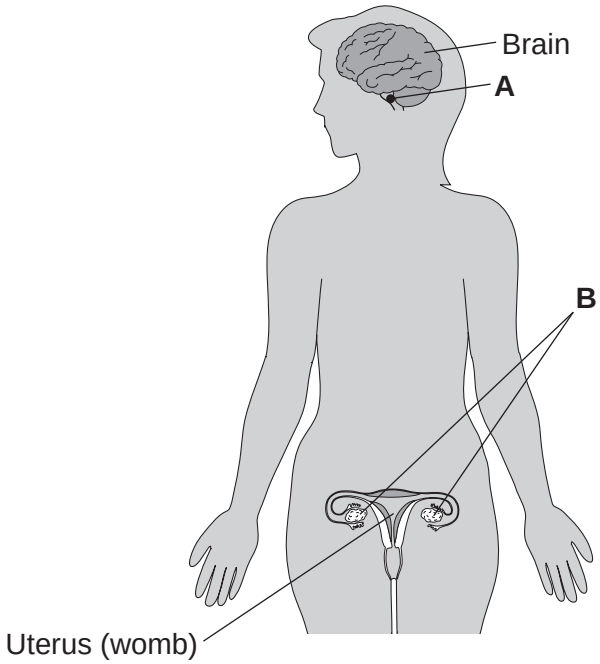
5

4.6.1.1 Sexual and asexual reproduction

Question 22

January 2013 | BL1HP | Original Q2 | Legacy

2 The diagram shows the position of two glands, **A** and **B**, in a woman.



2 (a) (i) Name glands **A** and **B**.

A .....

B .....

(2 marks)

2 (a) (ii) Gland **A** produces the hormone Follicle Stimulating Hormone (FSH).

FSH controls changes in gland **B**.

How does FSH move from gland **A** to gland **B**?

.....

(1 mark)

Question 2 continues on the next page

4.6.1.1 Sexual and asexual reproduction

Question 22 · continued

2 (b) (i) A woman is not able to become pregnant. The woman does not produce mature eggs. The woman decides to have In Vitro Fertilisation (IVF) treatment.

Which **two** hormones will help the woman produce and release mature eggs?

Tick (✓) **one** box.

FSH and Luteinising Hormone (LH) ☐

FSH and oestrogen ☐

Luteinising Hormone (LH) and oestrogen ☐

(1 mark)

2 (b) (ii) Giving these hormones to the woman helps her to produce several mature eggs. Doctors collect the mature eggs from the woman in an operation.

Describe how the mature eggs are used in IVF treatment so that the woman may become pregnant.

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(3 marks)

2 (b) (iii) IVF clinics have been set a target to reduce multiple births.

> At least 76% of IVF treatments should result in single babies and a maximum of 24% of treatments should result in multiple births.

Suggest **one** reason why the clinics have been set this target to reduce multiple births.

.....

.....

(1 mark)

4.6.1.1 Sexual and asexual reproduction

Question 22 · continued

2 (c) Two clinics, **R** and **S**, used IVF treatment on women in 2007. Doctors at each clinic used the results of the treatments to predict the success rate of treatments in 2008.

The table shows the information.

	Total number of IVF treatments in 2007	Number of IVF treatments resulting in pregnancy in 2007	Predicted percentage success rate in 2008
Clinic **R**	1004	200	18 – 23
Clinic **S**	98	20	3 – 56

2 (c) (i) Compare the success rates of the two clinics in 2007.

.....

.....

(1 mark)

2 (c) (ii) The range of the predicted success rate in 2008 for clinic **R** is much smaller than the range of the predicted success rate for clinic **S**.

Suggest why.

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(2 marks)

11

4.6.1.1 Sexual and asexual reproduction

Question 23

June 2013 | BL1HP | Original Q5 | Legacy

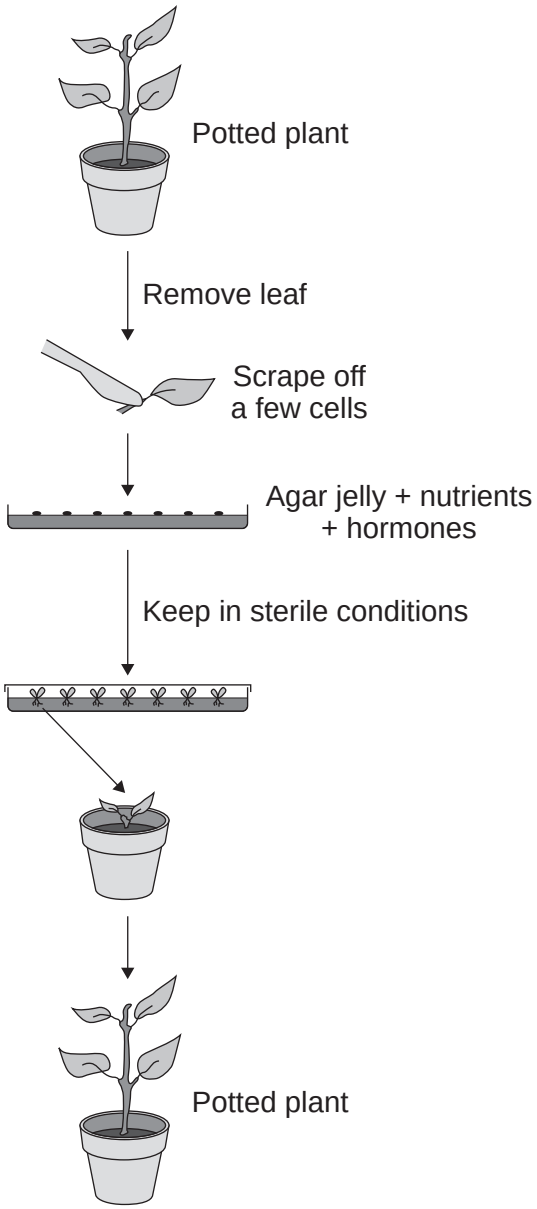
5 Plant hormones are used in horticulture.

5 (a) Name **one** plant hormone.

.....

(1 mark)

5 (b) The diagram shows how new plants are produced using tissue culture.



4.6.1.1 Sexual and asexual reproduction

Question 23 · continued

5 (b) (i) Tissue culture is a type of *asexual reproduction*.

Give the main features of *asexual reproduction*.

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(3 marks)

5 (b) (ii) Another method of producing new plants is by taking cuttings.

Suggest **one** advantage of using tissue culture and **not** using cuttings to produce plants.

.....

.....

.....

(1 mark)

5

4.6.1.1 Sexual and asexual reproduction

Question 24

June 2013 | BL2HP | Original Q8 | Legacy

8 The photographs show the flowers of two closely-related species of plant.

Species A



Species B



The drawings show chromosomes from one cell in the root of each plant during cell division.

Species A



One chromosome

Species B



One chromosome

8 (a) The drawings show that each chromosome has two strands of genetic material.

8 (a) (i) How does a chromosome become two strands?

.....

.....

(1 mark)

4.6.1.1 Sexual and asexual reproduction

Question 24 · continued

8 (a) (ii) Explain why each chromosome must become two strands before the cell divides.

.....

.....

.....

.....

(2 marks)

8 (b) For sexual reproduction, the plants produce gametes.

8 (b) (i) Name the type of cell division that produces gametes. .....

(1 mark)

8 (b) (ii) How many chromosomes would there be in a gamete from each of these two plant species?

Species A ☐ **Species B** ☐

(1 mark)

8 (b) (iii) It is possible for gametes from **Species A** to combine with gametes from **Species B** to produce healthy offspring plants.

How many chromosomes would there be in each cell of one of the offspring plants?

☐

(1 mark)

Question 8 continues on the next page

4.6.1.1 Sexual and asexual reproduction

Question 24 · continued

8 (c) (i) Look back at the information at the start of the question and the information from part **(b)**.

What evidence from these two pieces of information supports the belief that **Species A** and **Species B** evolved from a common ancestor?

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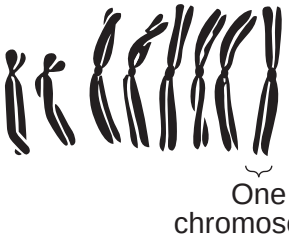
.....

(2 marks)

8 (c) (ii) For successful gamete production to take place, chromosomes that contain the same genes must pair up.

The drawings showing the chromosomes of **Species A** and of **Species B** are repeated below.

Species A



One chromosome

Species B



One chromosome

The offspring plants cannot reproduce sexually.

Suggest an explanation for this.

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(2 marks)

10

4.6.1.1 Sexual and asexual reproduction

Question 25

June 2014 | BL1HP | Original Q8 | Legacy

8 Read the information.

> Insects can be both useful and harmful to crop plants.
> Insects such as bees pollinate the flowers of some crop plants. Pollination is needed for successful sexual reproduction of crop plants.
> Some insects eat crops and other insects eat the insects that eat crops.
>
> Corn borers are insects that eat maize plants.
> A toxin produced by the bacterium *Bacillus thuringiensis* kills insects.
> Scientists grow *Bacillus thuringiensis* in large containers. The toxin is collected from the containers and is sprayed over maize crops to kill corn borers.
>
> A company has developed genetically modified (GM) maize plants. GM maize plants contain a gene from *Bacillus thuringiensis*. This gene changes the GM maize plants so that they produce the toxin.

8 (a) Describe how scientists can transfer the gene from *Bacillus thuringiensis* to maize plants.

[3 marks]

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4.6.1.1 Sexual and asexual reproduction

Question 25 · continued

8 (b) Would you advise farmers to grow GM maize plants?

Justify your answer by giving advantages and disadvantages of growing GM maize plants.

Use the information from the box and your own knowledge to help you.

[4 marks]

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7

4.6.1.1 Sexual and asexual reproduction

Question 26

June 2015 | BL1HP | Original Q8 | Legacy

8 As embryos develop, some genes in cells are turned off and some genes are turned on. This allows cells to become specialised for particular functions.

Usually, after cells have become specialised, they cannot change again into different types of cells.

8 (a) What is a gene?

[2 marks]

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.....

8 (b) Scientists have developed a way to change specialised cells back into embryo-like cells by a method called iPS.

Read the information in the box.

> Cells made using iPS can be changed into different types of cells.
>
> Scientists plan to take skin cells from an endangered species of monkey called a drill and change these cells into iPS cells. These iPS cells can then be changed into egg cells or sperm cells.
>
> After fertilisation, the embryo can be inserted into the womb of a female of a non-endangered species called a mandrill. The mandrill is closely related to the drill.

Describe similarities and differences between the iPS method and adult cell cloning.

[4 marks]

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4.6.1.1 Sexual and asexual reproduction

Question 26 · continued

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8 (c) Suggest **one** advantage of trying to preserve endangered species such as the drill.

[1 mark]

.....

.....

7

Turn over for the next question

4.6.1.1 Sexual and asexual reproduction

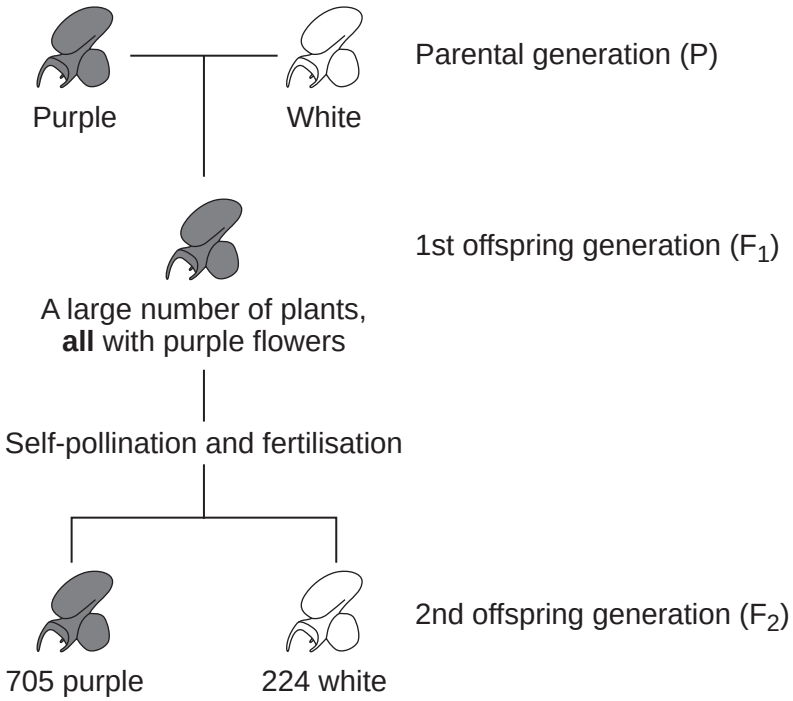
Question 27

June 2015 | BL2HP | Original Q8 | Legacy

8 In 1866, Gregor Mendel published the results of his investigations into inheritance in garden pea plants.

Figure 9 shows the results Mendel obtained in one investigation with purple-flowered and white-flowered pea plants.

Figure 9



8 (a) (i) Calculate the ratio of purple-flowered plants to white-flowered plants in the F_2 generation.

[1 mark]

Ratio of purple : white = ...

8 (a) (ii) There was a total of 929 plants in the F_2 generation.

Mendel thought that the production of a large number of offspring plants improved the investigation.

Explain why.

[2 marks]

.....

.....

.....

.....

4.6.1.1 Sexual and asexual reproduction

Question 27 · continued

8 (b) (i) Some of the plants in **Figure 9** are homozygous for flower colour and some are heterozygous.

Complete **Table 1** to show whether each of the plants is homozygous or heterozygous. For each plant, tick (✓) **one** box.

[2 marks]

Table 1

	Homozygous	Heterozygous
Purple-flowered plant in the P generation		
White-flowered plant in the P generation		
Purple-flowered plant in the F_1 generation		

8 (b) (ii) Draw a genetic diagram to show how self-pollination of the F_1 purple-flowered plants produced mainly purple-flowered offspring in the F_2 generation together with some white-flowered offspring.

Use the following symbols:

N = allele for purple flower colour
n = allele for white flower colour

[3 marks]

8 (c) When Mendel published his work on genetics, other scientists at the time did not realise how important it was.

Suggest **two** reasons why.

[2 marks]

1 .....

.....

2 .....

.....

10

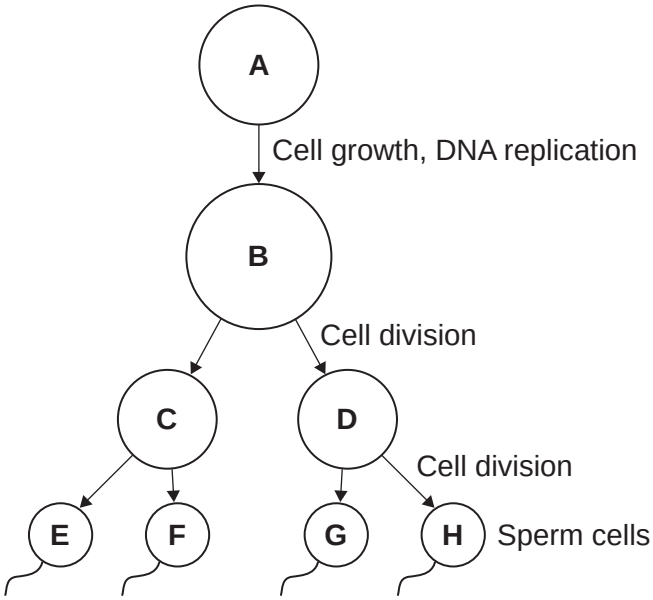
4.6.1.1 Sexual and asexual reproduction

Question 28

June 2016 | BL2HP | Original Q5 | Legacy

5 **Figure 4** shows the production of human sperm cells.

Figure 4



5 (a) Name the organ where the processes shown in **Figure 4** take place.

[1 mark]

_____

5 (b) (i) Not every cell in **Figure 4** contains the same amount of DNA.

Cell **A** contains 6.6 picograms of DNA (1 picogram = 10^{-12} grams).

How much DNA is there in each of the following cells?

[2 marks]

Cell **B** _____ picograms

Cell **C** _____ picograms

Cell **E** _____ picograms

5 (b) (ii) How much DNA would there be in a fertilised egg cell?

[1 mark]

_____ picograms

5 (b) (iii) A fertilised egg cell divides many times to form an embryo.

Name this type of cell division.

[1 mark]

_____

4.6.1.1 Sexual and asexual reproduction

Question 28 · continued

5 (c) After a baby is born, stem cells may be collected from the umbilical cord. These can be frozen and stored for possible use in the future.

5 (c) (i) What are stem cells?

[2 marks]

5 (c) (ii) Suggest why it is ethically more acceptable to take stem cells from an umbilical cord instead of using stem cells from a 4-day-old embryo produced by In Vitro Fertilisation (IVF).

[1 mark]

5 (c) (iii) Stem cells taken from a child's umbilical cord could be used to treat a condition later in that child's life.

Give **one** advantage of using the child's own umbilical cord stem cells instead of using stem cells donated from another person.

[1 mark]

5 (c) (iv) Why would it **not** be possible to treat a genetic disorder in a child using his own umbilical cord stem cells?

[1 mark]

10

4.6.1.1 Sexual and asexual reproduction

Question 29

June 2017 | BL1HP | Original Q7 | Legacy

7 Reproduction may be sexual or asexual.

7 (a) Describe **one** advantage to a species of sexual reproduction rather than asexual reproduction.

[1 mark]

_____

_____

7 (b) Mitochondria contain genes. The genes control some of the reactions in respiration.

In a person with mitochondrial disease, genes in the mitochondria are faulty. The person may have muscle weakness, blindness and heart failure.

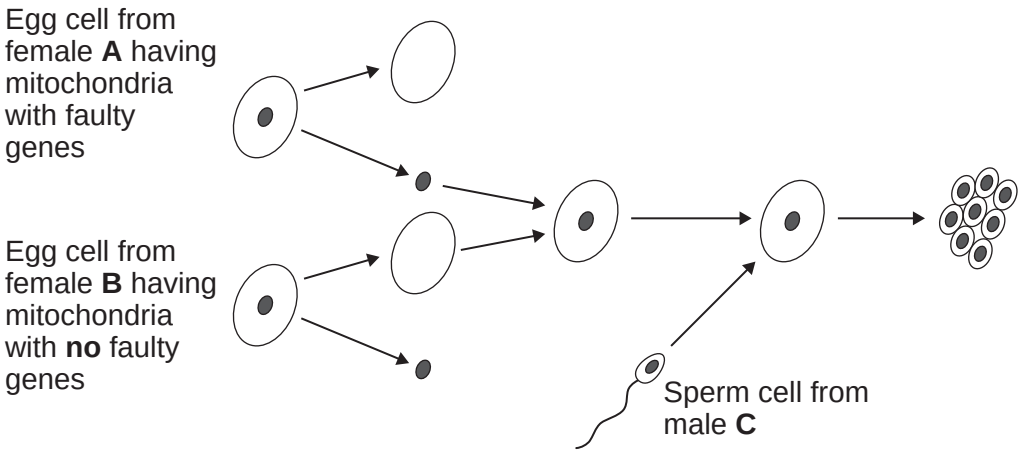
In human reproduction, an embryo will have mitochondria from the cytoplasm of the mother's egg cell.

Scientists have developed a way of solving the problem of a child inheriting mitochondrial disease.

Figure 6 shows the process.

The cells involved come from three different people, **A**, **B** and **C**.

Figure 6



4.6.1.1 Sexual and asexual reproduction

Question 29 · continued

7 (b) (i) Describe the process shown in **Figure 6**.

Use your knowledge of sexual reproduction and adult cell cloning.

[4 marks]

7 (b) (ii) Explain why the embryo formed from the process shown in **Figure 6** will **not** have mitochondrial disease.

[2 marks]

7 (b) (iii) Suggest **one** ethical objection to this process being used for reproduction in humans.

[1 mark]

8

4.6.1.1 Sexual and asexual reproduction

Question 30

0 5 Cell division is needed for growth and for reproduction.

0 5 . 1 **Table 3** contains three statements about cell division.

Complete **Table 3**.

[2 marks]

Tick **one** box for each statement.

Table 3

Statement	Statement is true for		
	Mitosis only	**Meiosis only**	**Both mitosis and meiosis**
All cells produced are genetically identical			
In humans, at the end of cell division each cell contains 23 chromosomes			
Involves DNA replication			

4.6.1.1 Sexual and asexual reproduction

Question 30 · continued

Bluebell plants grow in woodlands in the UK.

- Bluebells can reproduce sexually by producing seeds.
- Bluebells can also reproduce asexually by making new bulbs.

0 5 . 2 One advantage of asexual reproduction for bluebells is that only **one** parent is needed.

Suggest **two** other advantages of asexual reproduction for bluebells.

[2 marks]

1

2

0 5 . 3 Explain why sexual reproduction is an advantage for bluebells.

[4 marks]

8

4.6.1.1 Sexual and asexual reproduction

Question 31

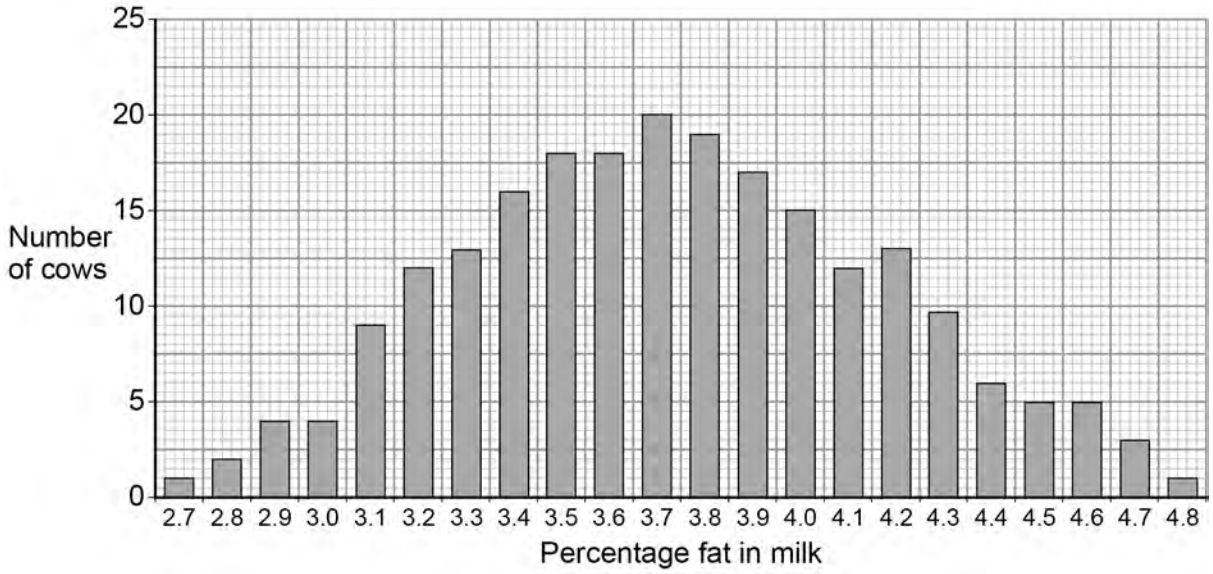
June 2018 | 8461/2H | Original Q8

0 8 Scientists want to breed cows that produce milk with a low concentration of fat.

Figure 10 shows information about the milk in one group of cows.

The cows were all the same type.

Figure 10



0 8 . 1 In **Figure 10** the mean percentage of fat in the milk is equal to the modal value.

Give the mean percentage of fat in the milk of these cows.

[1 mark]

Mean percentage = _____

0 8 . 2 A student suggested:

'The percentage of fat in milk is controlled by one dominant allele and one recessive allele.'

How many different phenotypes would this produce?

[1 mark]

Tick **one** box.

2		3		22		46	

4.6.1.1 Sexual and asexual reproduction

Question 31 · continued

0 8 . 3 Give the evidence from **Figure 10** which shows the percentage of fat in the milk is controlled by several genes.

[1 mark]

0 8 . 4 One of the genes codes for an enzyme used in fat metabolism.

A mutation in this gene causes a reduction in milk fat.

The mutation changes one amino acid in the enzyme molecule.

Explain how a change in one amino acid in an enzyme molecule could stop the enzyme working.

[3 marks]

Question 8 continues on the next page

4.6.1.1 Sexual and asexual reproduction

Question 31 · continued

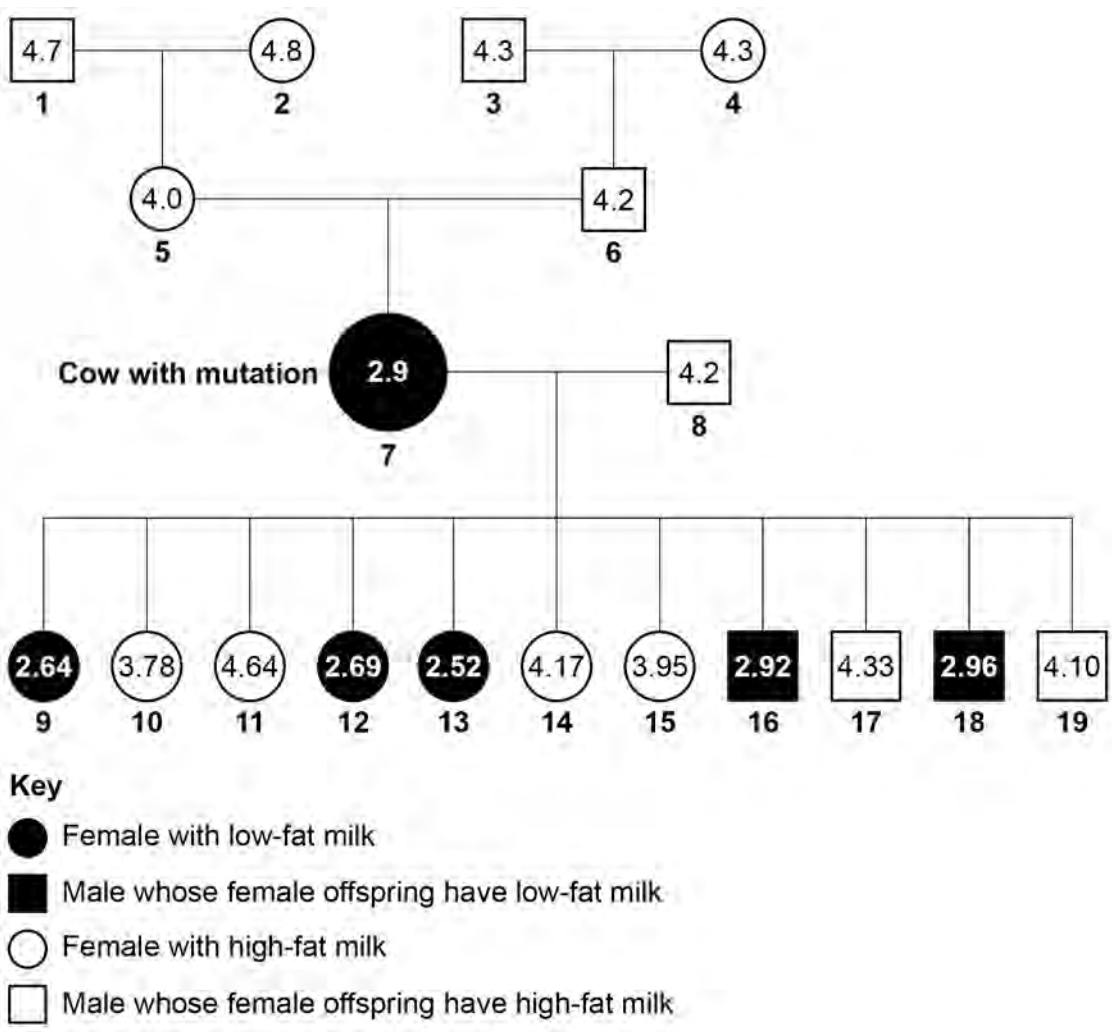
The scientists found one cow with a mutation.

The cow's milk contained only 2.9% fat.

Figure 11 shows the percentage of fat in the milk of cattle related to the cow with the mutation.

The values for male cattle are the mean values of their female offspring.

Figure 11



4.6.1.1 Sexual and asexual reproduction

Question 31 · continued

0 8 . 5 Animal **8** is homozygous.

The mutation in animal **7** produced a dominant allele for making low-fat milk.

Give evidence from **Figure 11** that animal **7** is heterozygous.

[1 mark]

0 8 . 6 Animals **7** and **8** produced 11 offspring. These offspring were produced by in vitro fertilisation (IVF).

The embryos from IVF were transferred into 11 other cows.

Suggest why IVF and embryo transfer were used rather than allowing animals **7** and **8** to mate naturally.

[1 mark]

0 8 . 7 Draw a Punnett square diagram to show a cross between animals **7** and **8**.

Identify which offspring produce low-fat milk and which offspring produce high-fat milk.

[4 marks]

Use the following symbols:

D = dominant allele for making low-fat milk

d = recessive allele for making high-fat milk

4.6.1.1 Sexual and asexual reproduction

Question 31 · continued

0 8 . 8 The scientists want to produce a type of cattle that makes large volumes of low-fat milk.

The scientists will selectively breed some of the animals shown in **Figure 11**.

Describe how the scientists would do this.

[4 marks]

16

4.6.1.1 Sexual and asexual reproduction

Question 32

November 2021 | 8461/2H | Original Q1

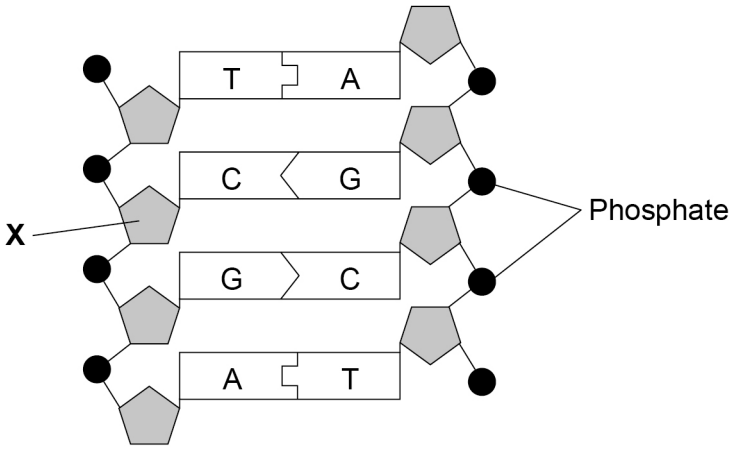
0 1 The nucleus of a cell contains DNA.

0 1 . 1 Name the structures inside the cell nucleus that contain DNA.

[1 mark]

Figure 1 shows part of a DNA molecule.

Figure 1



0 1 . 2 Name the part of the DNA molecule labelled **X**.

[1 mark]

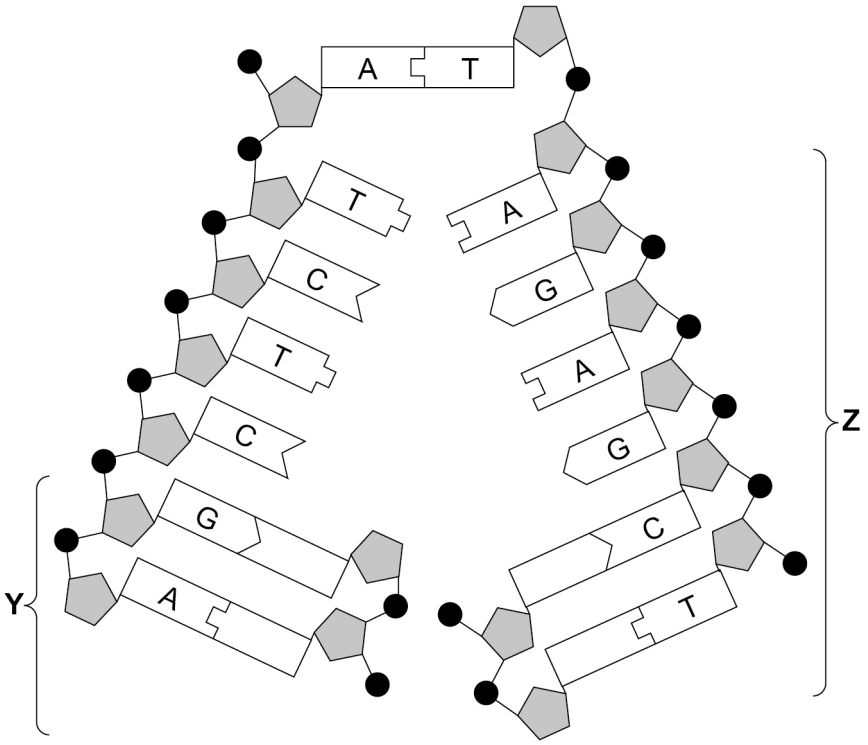
0 1 . 3 What type of substances are labelled **A**, **C**, **G** and **T** in **Figure 1**?

[1 mark]

Question 32 · continued

Figure 2 shows another section of a DNA molecule.

Figure 2



0 1 . 4 Four of the substances you named in Question **01.3** are **not** labelled in part **Y** of **Figure 2**.

Label each of these substances with the correct letter, **A**, **C**, **G** or **T**.

Use information from other parts of **Figure 2** to help you.

[1 mark]

0 1 . 5 What is happening to the DNA in part **Z** of **Figure 2**?

[1 mark]

Tick (✓) **one** box.

- Differentiation ☐
- Evolution ☐
- Fertilisation ☐
- Replication ☐

4.6.1.1 Sexual and asexual reproduction

Question 32 · continued

0 1 . 6 A gene is a length of DNA.

What type of substance does a gene code for?

[1 mark]

0 1 . 7 Most human body cells contain 6×10^{-12} grams of DNA.

What mass of DNA will a human sperm cell contain?

[1 mark]

Tick (✓) **one** box.

- 6×10^{-6} grams ☐
- 6×10^{-12} grams ☐
- 3×10^{-6} grams ☐
- 3×10^{-12} grams ☐

0 1 . 8 What is the name of the type of cell division that produces sperm cells?

[1 mark]

Tick (✓) **one** box.

- Binary fission ☐
- Differentiation ☐
- Meiosis ☐
- Mitosis ☐

8

4.6.1.1 Sexual and asexual reproduction

Question 33

0 4 Plants and animals have many defence responses.

0 4 . 1 **Table 5** shows some plant defences.

Identify whether each defence is a chemical response or a physical response.

[2 marks]

Tick (✓) **one** box in each row.

Table 5

	Type of response	
Plant defence	**Chemical**	**Physical**
Thick, waxy layer on leaf surface		
Berries that are poisonous		
Bark on trees that falls off		

4.6.1.1 Sexual and asexual reproduction

Question 33 · continued

Mimicry is a mechanical adaptation seen in both plants and animals.

Figure 5 shows two insects.

Figure 5



Hornet **Hornet Moth**

0 4 . 2 Hornets are insects that sting other animals and cause pain.

Hornet moths do **not** sting other animals.

Suggest how mimicry helps the **hornet moth** survive.

[1 mark]

Question 4 continues on the next page

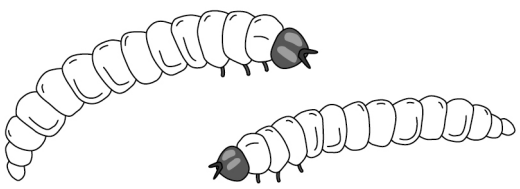
4.6.1.1 Sexual and asexual reproduction

Question 33 · continued

Adult hornet moths lay eggs that hatch into larvae.

Figure 6 shows the larvae of a hornet moth.

Figure 6



0 4 . 3 The larvae of the hornet moth:

- live inside the roots of trees
- use the tree roots as a source of food
- cause damage to the tree roots.

Explain why a tree might die if the roots of the tree are damaged.

[6 marks]

4.6.1.1 Sexual and asexual reproduction

Question 33 · continued

0 4 . 4 The larvae of the hornet moth form when fertilised eggs divide by mitosis.

Describe how mitosis produces two genetically identical cells.

[4 marks]

0 4 . 5 The cells which are first formed from the fertilised eggs of the hornet moth are stem cells.

Name the process by which these stem cells then form specialised cells.

[1 mark]

14

4.6.1.1 Sexual and asexual reproduction

Question 34

June 2022 | 8461/2H | Original Q1

0 1 There are two types of reproduction:

- sexual reproduction
- asexual reproduction.

0 1 . 1 Complete **Table 1** to compare sexual reproduction with asexual reproduction.

Write a tick (✓) in the box if the statement is true.

The first row has been completed for you.

[2 marks]

Table 1

	Sexual reproduction	Asexual reproduction
Cell division occurs	✓	✓
Fertilisation occurs		
Genes are passed on from parent to offspring		
Offspring are genetically identical to each other		

0 1 . 2 Gametes are formed in sexual reproduction.

Name the male gamete formed in flowering plants.

[1 mark]

_____

Question 1 continues on the next page

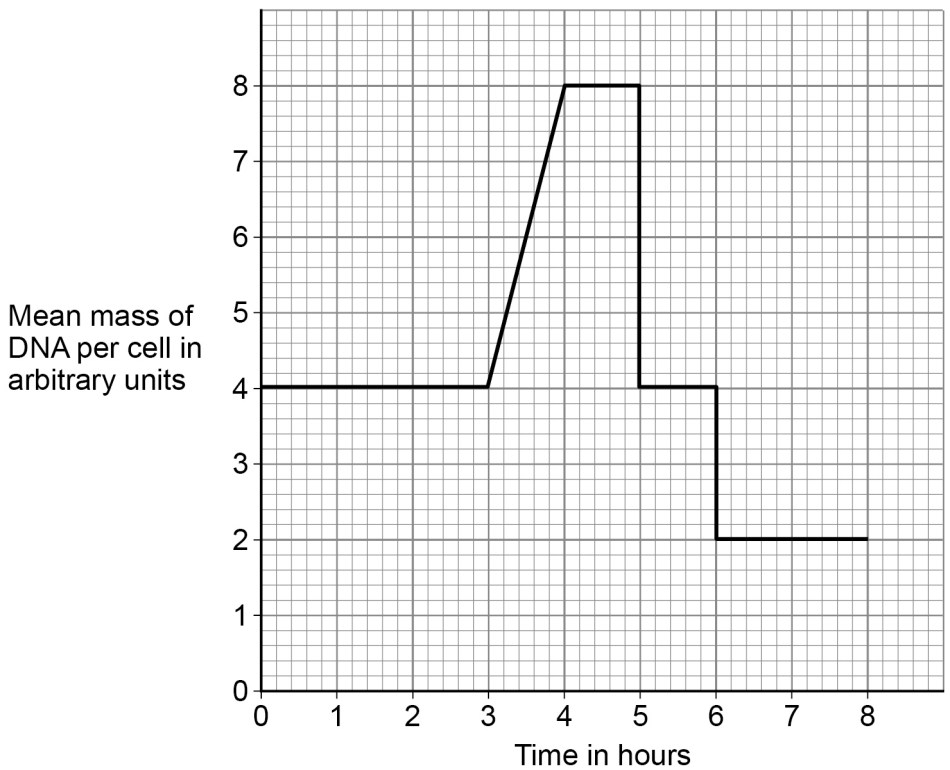
4.6.1.1 Sexual and asexual reproduction

Question 34 · continued

Cell division by meiosis forms gametes.

Figure 1 shows the mean mass of DNA per cell before, during and after meiosis.

Figure 1



Use information from **Figure 1** to answer questions **01.3** to **01.6**.

0 1 . 3 When is the DNA in the chromosomes being copied?

[1 mark]

Tick (✓) **one** box.

- Between 0 and 3 hours ☐
- Between 3 and 4 hours ☐
- Between 4 and 5 hours ☐
- Between 5 and 6 hours ☐

4.6.1.1 Sexual and asexual reproduction

Question 34 · continued

0 1 . 4 Cells divide twice during meiosis.

Which **two** times in **Figure 1** show one cell dividing into two cells?

[2 marks]

Tick (✓) **two** boxes.

- 3 hours ☐
- 4 hours ☐
- 5 hours ☐
- 6 hours ☐
- 8 hours ☐

0 1 . 5 What is the mean mass of DNA in arbitrary units in a sperm cell?

[1 mark]

Tick (✓) **one** box.

2 ☐ 4 ☐ 8 ☐ 16 ☐

0 1 . 6 What is the mean mass of DNA in arbitrary units in each cell in an embryo?

[1 mark]

Tick (✓) **one** box.

2 ☐ 4 ☐ 8 ☐ 16 ☐

8

4.6.1.1 Sexual and asexual reproduction

Question 35

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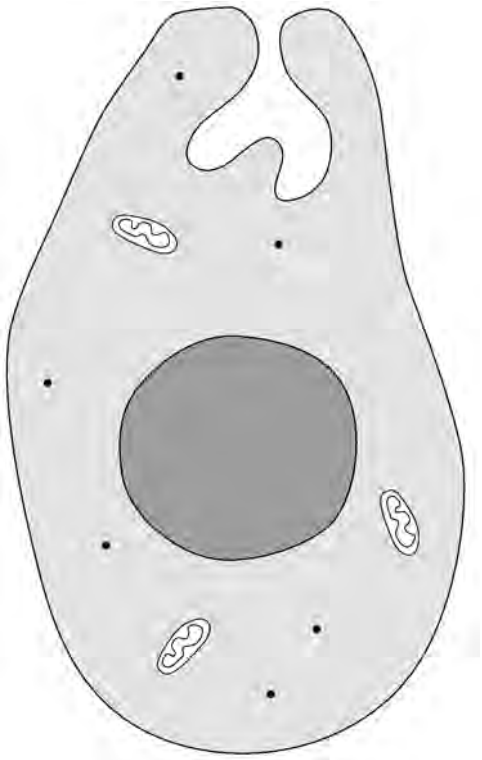
0 5 The protist that causes malaria is passed from one person to another person by mosquitos.

0 5 . 1 What term describes an organism that passes a pathogen from one person to another person?

[1 mark]

0 5 . 2 **Figure 7** shows the malarial protist.

Figure 7



4.6.1.1 Sexual and asexual reproduction

Question 35 · continued

The malarial protist is a eukaryotic cell.

Describe **three** ways the structure of the malarial protist is different from the structure of a prokaryotic cell.

Do **not** refer to size in your answer.

[3 marks]

1 _____

2 _____

3 _____

0 5 . 3 During one stage of malaria infection, the malarial protists enter red blood cells and cause them to burst.

Explain why the bursting of red blood cells causes tiredness.

[2 marks]

_____

_____

_____

_____

Question 5 continues on the next page

4.6.1.1 Sexual and asexual reproduction

Question 35 · continued

0 5 . 4 The malarial protist reproduces sexually and asexually during a life cycle.

Complete **Table 3** to give **three** differences between sexual reproduction and asexual reproduction.

[3 marks]

One difference has been completed for you.

Table 3

	Sexual reproduction	Asexual reproduction
	Involves two parents	Involves one parent
1		
2		
3		

0 5 . 5 One drug for treating malaria prevents mitosis occurring in the malarial protist.

The drug stops the synthesis of new DNA bases in the cell.

Suggest how the drug prevents mitosis occurring.

[1 mark]

4.6.1.1 Sexual and asexual reproduction

Question 35 · continued

0 5 . 6 Describe the process of cell division by mitosis.

[3 marks]

Question 5 continues on the next page

0 5 . 7 Different types of disease may interact.

Scientists studied the incidence of malaria infections in children:

- with disorder **S**
- without disorder **S**.

The incidence of malaria in children with disorder **S** was calculated as a percentage of the incidence in children without disorder **S**.

Table 4 shows the results.

Table 4

Age in years	Calculated percentage (%) incidence of malaria in children with disorder S
2 to < 4	69
4 to < 6	63
6 to < 8	50
8 to 10	45
> 10	73

Describe what the results in **Table 4** show about the interaction between disorder **S** and malaria.

[2 marks]

15

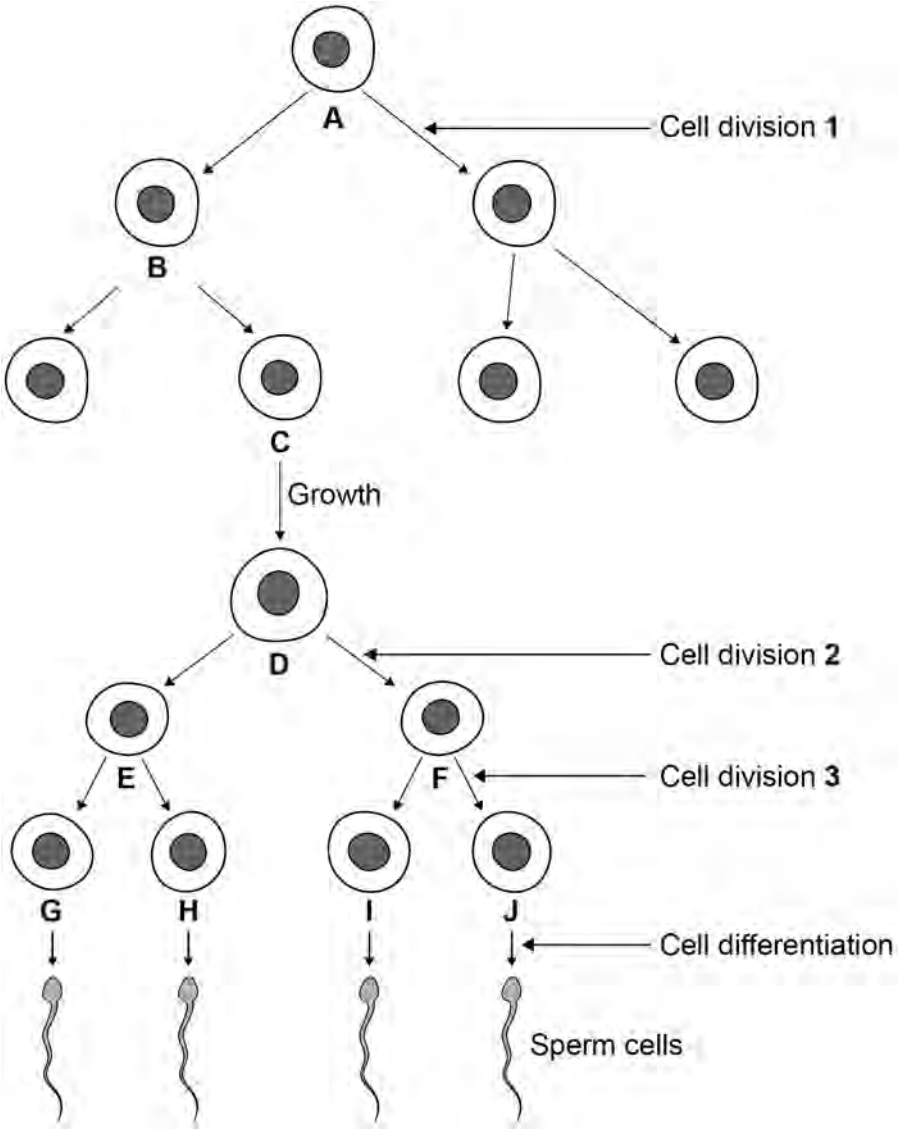
4.6.1.1 Sexual and asexual reproduction

Question 36

0 6 New cells are produced by cell division.

Figure 5 shows sperm formation in a human.

Figure 5



4.6.1.1 Sexual and asexual reproduction

Question 36 · continued

0 6 . 1 Which cell division in **Figure 5** represents mitosis?

[1 mark]

Tick (✓) **one** box.

Cell division **1** ☐

Cell division **2** ☐

Cell division **3** ☐

0 6 . 2 Which two cells in **Figure 5** are genetically identical?

[1 mark]

Tick (✓) **one** box.

A and **C** ☐ **B** and **I** ☐ **F** and **J** ☐ **G** and **H** ☐

0 6 . 3 How many chromosomes are there in cell **J** in **Figure 5**?

[1 mark]

0 6 . 4 How many of the cells **C**, **D**, **E**, **F**, **G**, **H**, **I** and **J** contain a Y chromosome?

Use **Figure 5**.

[1 mark]

Question 6 continues on the next page

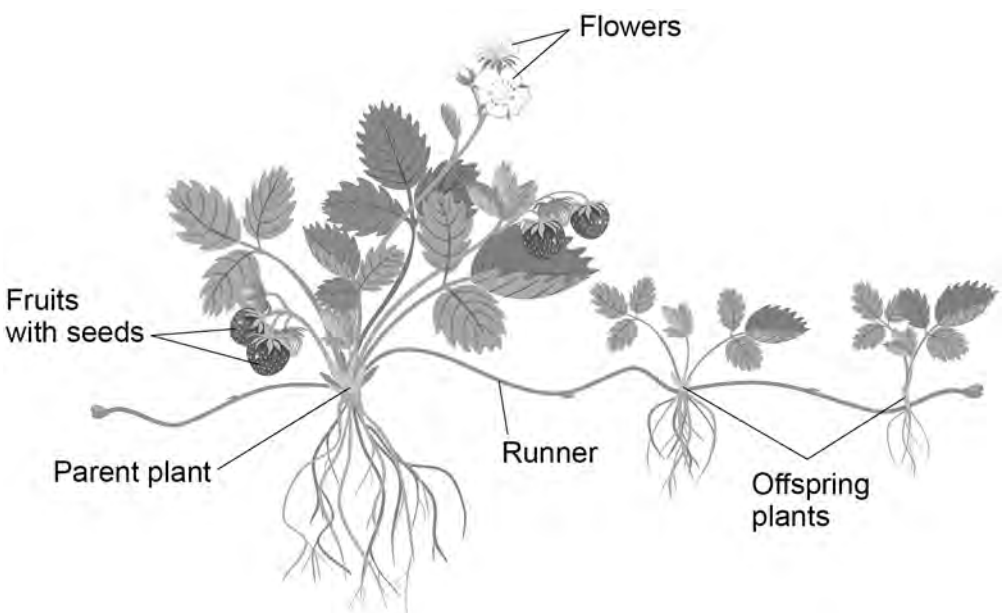
Question 36 · continued

Strawberry plants can reproduce both sexually and asexually.

Figure 6 shows a strawberry plant reproducing:

- sexually using flowers, fruits and seeds
- asexually using horizontal stems called runners.

Figure 6



0 6 . 5 Explain why the offspring produced using runners are genetically identical.

[2 marks]

4.6.1.1 Sexual and asexual reproduction

Question 36 · continued

0 6 . 6 Explain why the offspring produced using flowers, fruits and seeds are **not** genetically identical.

[2 marks]

0 6 . 7 Describe **two** advantages of **asexual** reproduction for the survival of strawberry plants.

[2 marks]

1

2

0 6 . 8 Describe **two** advantages of **sexual** reproduction for the survival of strawberry plants.

[2 marks]

1

2

12