

1.

Chromosomes carry genetic information.

Chromosomes are found in nearly all human cells.

(a) How many chromosomes are there in most human body cells?

Tick **one** box.

23 ☐

24 ☐

46 ☐

48 ☐

(1)

(b) How many chromosomes are there in a human gamete cell?

(1)

(c) Complete the sentences.

Choose the answers from the box.

sexual reproduction	binary fission	egg	fertilisation	meiosis
mitosis	ovary	sperm	testis	uterus

The female gamete is called the _____.

The male gamete is called the _____.

The female gamete is produced in the _____.

Gametes are produced by a type of cell division

called _____.

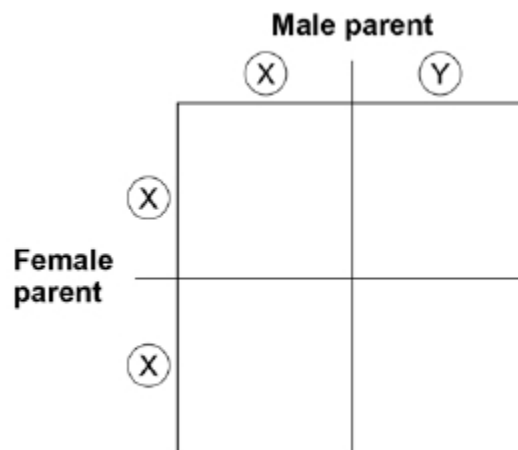
Male and female gametes join together in a process

called _____.

(5)

In humans, the sex chromosomes are called **X** and **Y**.

The diagram shows the inheritance of sex chromosomes.



(d) Complete the diagram above to show the sex chromosomes inherited by the offspring.

(2)

(e) What is the chance that a child produced by these parents will be female?

Tick **one** box.

1 in 2

☐

1 in 3

☐

1 in 4

☐

3 in 4

☐

(1)

- (f) The parents shown in the diagram above have five children.

Give **two** reasons why these children all look different from each other.

1. _____

2. _____

(2)

(Total 12 marks)

2.

Cell division is needed for growth and for reproduction.

- (a) The table below contains three statements about cell division.

Complete the table.

Tick **one** box for each statement.

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			

(2)

Bluebell plants grow in woodlands in the UK.

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

- (b) One advantage of asexual reproduction for bluebells is that only **one** parent is needed.

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

1. _____

2. _____

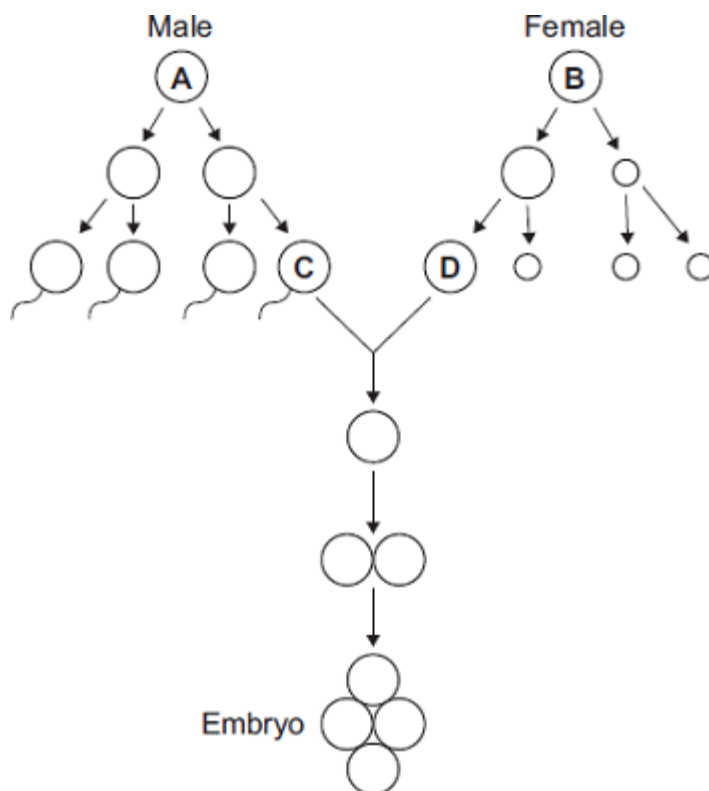
(2)

(c) Explain why sexual reproduction is an advantage for bluebells.

(4)
(Total 8 marks)

3.

The diagram shows some of the cell divisions that occur during human reproduction.



(a) (i) Name the type of cell division that produces cell **D** from cell **B**.

(1)

- (ii) Which organ in the male body produces cell **C** from cell **A**?

(1)

- (b) (i) Cells **A** and **B** each contain 46 chromosomes.

How many chromosomes would there be in the nucleus of cell **C**?

(1)

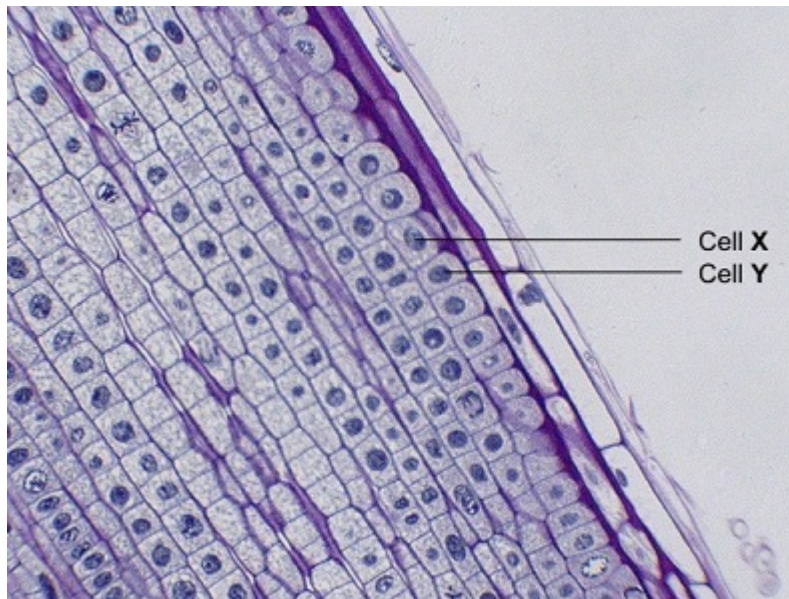
- (ii) Why is it important that cell **C** has this number of chromosomes?

(2)

(Total 5 marks)

4.

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



By UAF Center for Distance Education [CC BY 2.0], via Flickr

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

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

(1)

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

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

(1)

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

(3)

(Total 5 marks)

5.

A child saved apple seeds from an apple she ate. She planted the seeds in the garden. A few years later the apple trees she had grown produced apples.

(a) The apples from the new trees did **not** taste like the original apple.

Explain why.

(2)

(b) (i) Apple trees can be reproduced so that the apples from the new trees will taste the same as the apples from the parent trees.

Give **one** method used to reproduce apple trees in this way.

(1)

- (ii) Explain why the method you have suggested in part (b)(i) will produce apples that taste the same as the apples from the parent trees.

(2)

(Total 5 marks)

6.

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

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

1.

2.

(2)

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

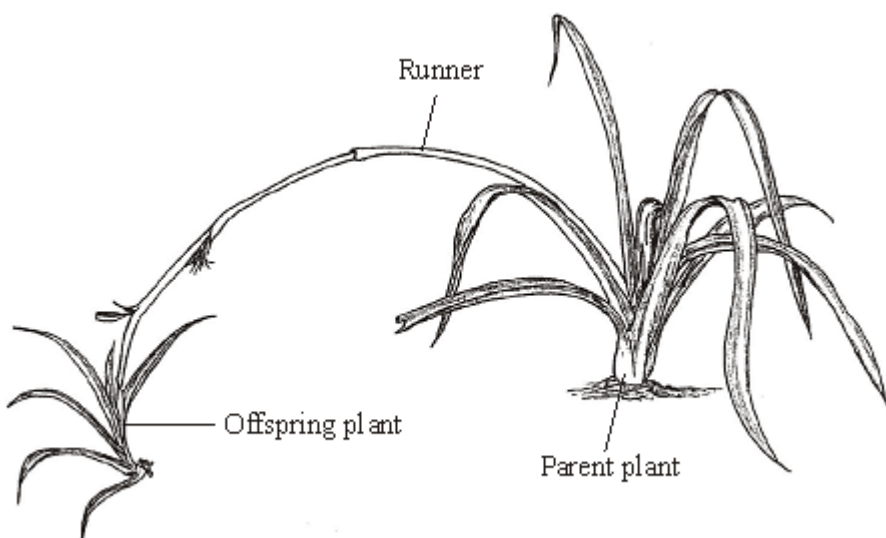
Explain why.

(2)

(Total 4 marks)

7.

The diagram shows a spider plant during one type of reproduction.



Complete the sentences using words from the box.

asexual	characteristics	chromosomes
gametes	genes	mitosis
		sexual

- (a) The colour and shape of the leaves of a spider plant are known as _____ (1)
- (b) The shape of the leaves is controlled by _____ (1)
- (c) The thread-like structures inside the nucleus of the cells are called _____ (1)
- (d) The spider plant produces new cells in the runner by a process called _____ (1)
- (e) This type of reproduction is called _____ reproduction. (1)

(Total 5 marks)