Reproduction 3

Q:1 Chromosomes contain molecules of DNA. Genes are small sections of DNA.

(a) Each gene contains a code.

What does a cell use this code for?

_____

_____

_____

_____

(2 marks)

(b) DNA fingerprints can be used to identify people. One example of the use of DNA fingerprints is to find out which man is the father of a child.

The diagram shows the DNA fingerprints of a child, the child's mother and two men who claim to be the child's father.

The numbers refer to the bars on the DNA fingerprints.

(b) **(i)** Which man, A or B, is more likely to be the father of the child?

Use the numbers on the DNA fingerprints to explain your choice.

In your answer you should refer to all four people.

(3 marks)

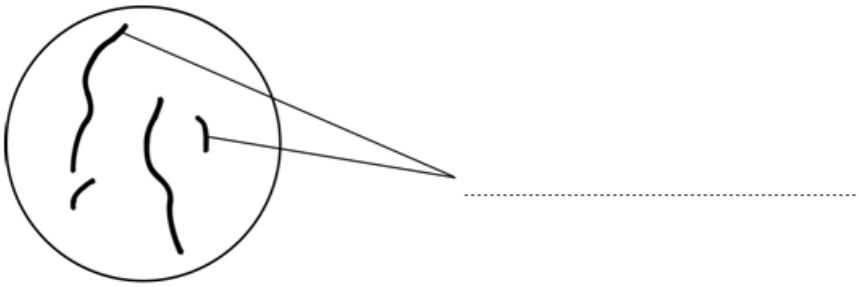
(b)(ii) Only half the bars of the child's DNA fingerprint match the mother's DNA fingerprint.

Explain why.

(2 marks)

Q:2 Diagram 1 shows the nucleus of a body cell as it begins to divide by mitosis.

Diagram 1



(a) Use a word from the box to label Diagram 1.

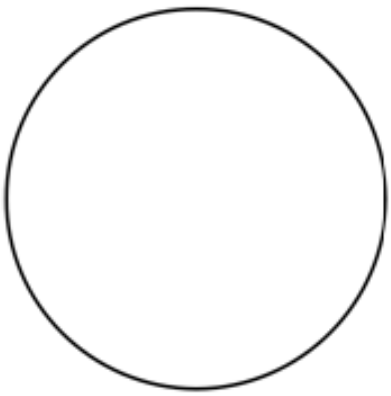
alleles	chromosomes	gametes

(1 mark)

(b) Complete Diagram 2 to show what the nucleus of one of the cells produced by this mitosis would look like.

Diagram 2

Diagram 2



(1 mark)

(c) Stem cells from a recently dead embryo can be grown in special solutions. Some facts about stem cells are given below.

Stem cells from an embryo can grow into any type of tissue.

Stem cells may grow out of control, to form cancers.

Large numbers of stem cells can be grown in the laboratory.

Stem cells may be used in medical research or to treat some human diseases.

Patients treated with stem cells need to take drugs for the rest of their life to prevent rejection.

Collecting and growing stem cells is expensive.

Use only the information above to answer these questions.

(c)(i) Give two advantages of using stem cells.

1 _____

_____

2 _____

_____

(2 marks)

(c)(ii) Give two disadvantages of using stem cells.

1 _____

_____

2. _____

_____

(2 mark)

Q:3 The table shows the number of chromosomes found in each body cell of some different organisms.

Animals		Plants	
Species	**Number of chromosomes in each body cell**	**Species**	**Number of chromosomes in each body cell**
Fruit fly	8	Tomato	24
Goat	60	Potato	44
Human	46	Rice	24

(a) Nearly every organism on earth has an even number of chromosomes in its body cells.

Suggest why.

_____

_____

(1 mark)

(b) Chromosomes contain DNA molecules.

Describe the function of DNA.

_____

_____

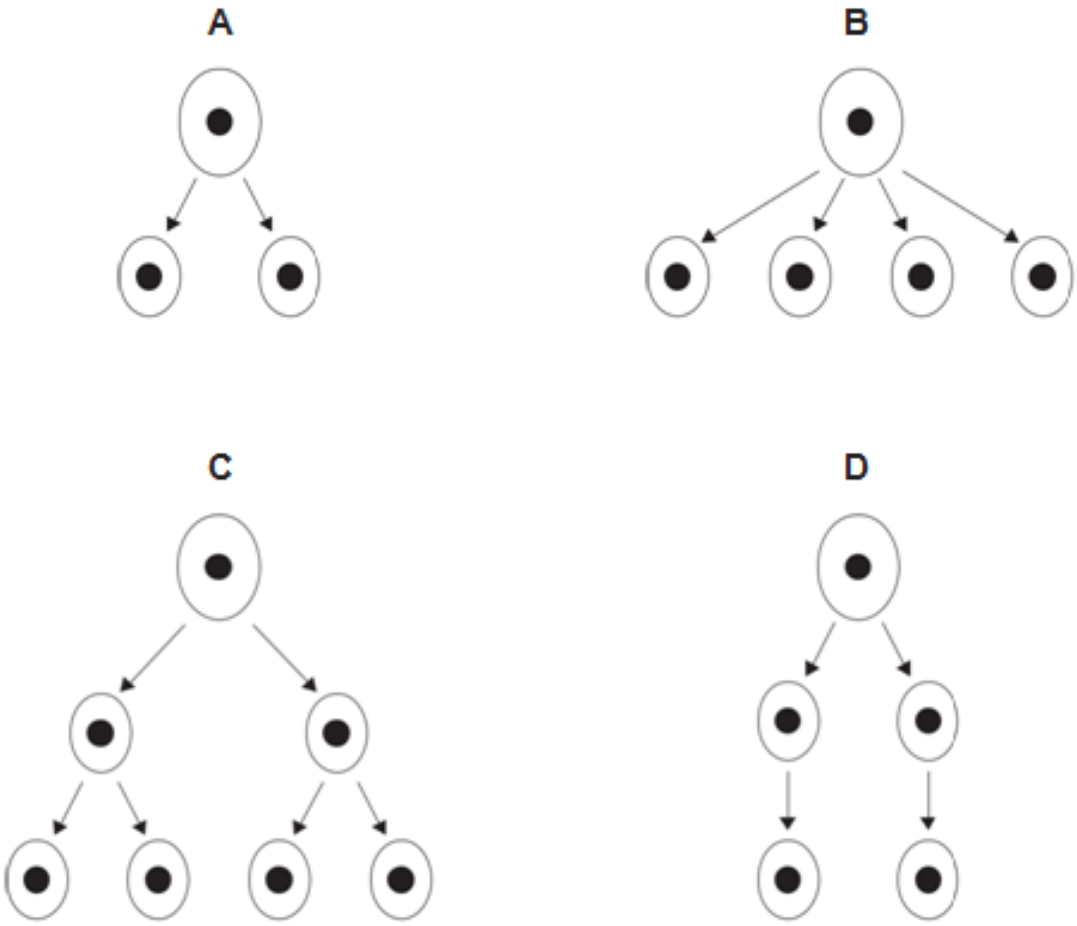
_____

_____

(2 marks)

(c) Gametes are made in the testes by meiosis.

(c) (i) Look at the diagrams.



Which diagram, A, B, C or D, represents how cell division by meiosis produces gametes in the testes?

(1 mark)

(c) (ii) How many chromosomes will each goat gamete contain?

_____

(1 mark)

(d) Body cells divide by mitosis.

(d) (i) Why is the ability of body cells to divide important

_____

_____

(1 mark)

(d) (ii) When a body cell of a potato plant divides, how many chromosomes will each of the new cells contain?

_____

(1 mark)

Q:4(a) Human body cells contain 46 chromosomes.

_____

(a) (i) How many chromosomes are there in a human sperm cell? **(1 mark)**

☐

(a) (ii) Name the part of the sperm cell that contains the chromosomes.

_____

(1 mark)

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

(b) (i) In human females, the sex chromosomes are

X and X.
X and Y.
Y and Y.

(1 mark)

(b) (ii) In human males, the sex chromosomes are

X and X.
X and Y.
Y and Y.

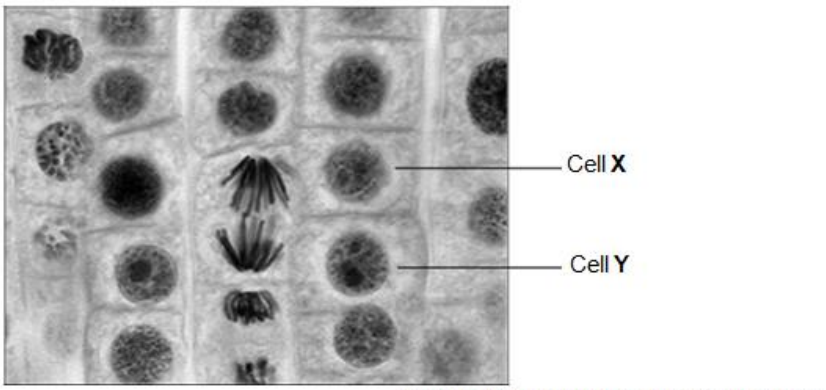
(1 mark)

(c) A man might release 300 million sperm cells at a time.

How many of these sperm cells would contain an X chromosome?

_____ **(1 mark)**

Q:5 The photograph shows some cells in the root of an onion plant.



Photograph: © Karen Wynne, Tyler Junior College

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

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

_____

(1 mark)

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

_____

(1 mark)

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

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

_____

_____

_____

_____

_____

_____

(3 marks)

TOTAL MARKS=30