Inheritance – 2023 June IGCSE Biology 0610

1. June/2023/Paper_0610/11/No.33
What is defined as a length of DNA that codes for a protein?

A amino acid

B antibody

C chromosome

D gene

2. June/2023/Paper_0610/11/No.34
A man has three sons.

What is the chance of his next child being a daughter?

A 0% **B** 25% **C** 50% **D** 100%

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3. June/2023/Paper_0610/11/No.35
Which term is a genetic change?

A allele

B genotype

C mutation

D phenotype

4. June/2023/Paper_0610/12/No.31

Which human characteristics are inherited?

	blood group	eye colour	language	sex
A	✓	✓	✗	✓
B	✓	✓	✓	✗
C	✗	✓	✗	✓
D	✓	✗	✓	✓

key

✓ = inherited

✗ = not inherited

5. June/2023/Paper_0610/12/No.33

When breeding, which pair of parents will be pure-breeding for a particular characteristic?

A a heterozygous and a homozygous individual

B two heterozygous individuals

C two homozygous individuals

D two individuals with the same phenotype

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6. June/2023/Paper_0610/12/No.34

In a pea plant, the allele for round seeds, R, is dominant to the allele for wrinkled seeds, r.

If plants with the genotype Rr are crossed, what are the likely proportions of offspring?

A all with round seeds

B all with wrinkled seeds

C 1 with round seeds : 1 with wrinkled seeds

D 3 with round seeds : 1 with wrinkled seeds

7. June/2023/Paper_0610/21/No.30

The statements describe how a protein is made.

1 mRNA passes through a ribosome.

2 mRNA molecules carry a copy of the gene to the cytoplasm.

3 The gene coding for the protein is copied in the nucleus.

4 Ribosomes assemble amino acids into proteins.

What is the order of statements that describes how a protein is made?

A 2 → 1 → 3 → 4

B 2 → 3 → 4 → 1

C 3 → 1 → 2 → 4

D 3 → 2 → 1 → 4

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8. June/2023/Paper_0610/21/No.31

Which parents could produce offspring with blood group O?

A heterozygous father with blood group A and heterozygous mother with blood group B

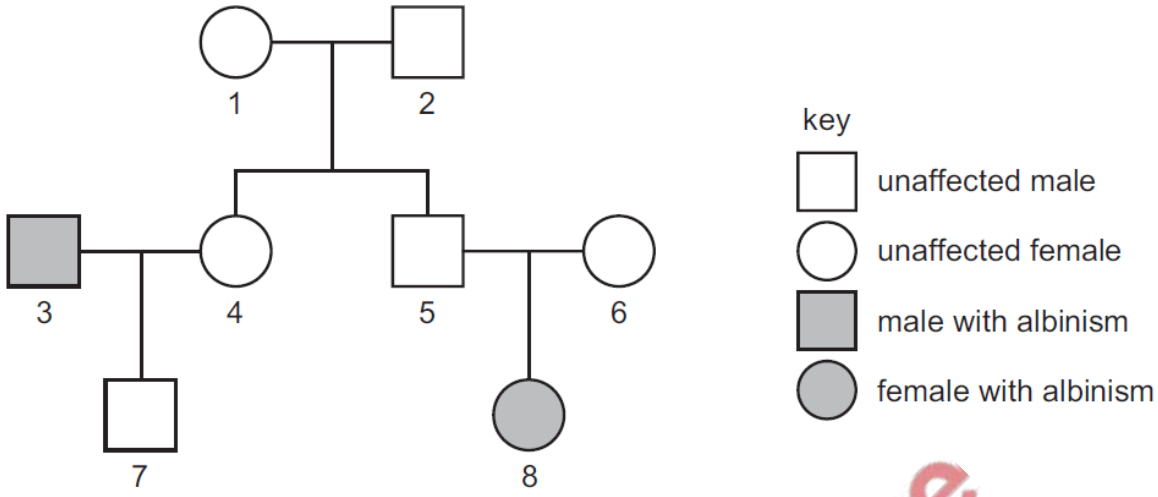
B heterozygous father with blood group A and homozygous mother with blood group B

C homozygous father with blood group A and heterozygous mother with blood group B

D homozygous father with blood group A and homozygous mother with blood group O

9. June/2023/Paper_0610/21/No.32

The diagram shows the inheritance of albinism in one family. Albinism is an inherited condition caused by a recessive allele.



Which individuals **must** be heterozygous for this condition?

A 1 and 2 **B** 4 and 7 **C** 5, 6 and 7 **D** 5 and 6 only

10. June/2023/Paper_0610/21/No.33

Which term is a genetic change?

A allele

B genotype

C mutation

D phenotype

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11. June/2023/Paper_0610/22/No.31

A man of genotype I^AI^o and woman of genotype I^BI^o have a child.

What is the chance that the child will have the same blood group as one of its parents?

A zero **B** 1 in 4 **C** 1 in 2 **D** 3 in 4

12. June/2023/Paper_0610/22/No.32

A man who has red-green colour blindness has a child with a woman who does **not** have red-green colour blindness. The child has red-green colour blindness. The man and woman decide to have another child.

What is the percentage probability that their next child will have red-green colour blindness?

A 0% **B** 25% **C** 50% **D** 100%

13. June/2023/Paper_0610/22/No.33

Which types of variation can be inherited?

	variation caused by genes	variation caused by the environment
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key

✓ = yes

✗ = no

14. June/2023/Paper_0610/23/No.30

Which substance is coded for by a length of DNA?

A base

B glucose

C glycerol

D lipase

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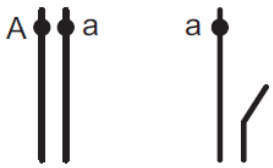
15. June/2023/Paper_0610/23/No.31

The diagram shows the sex chromosomes of a woman and of a man. Their genotypes for a recessive sex-linked condition are also shown.



key

A is dominant
a is recessive

What are the chances that their daughter will show the sex-linked condition?

A 0% **B** 25% **C** 50% **D** 75%

16. June/2023/Paper_0610/23/No.32

Which Punnett square shows a test cross that identifies a heterozygous parent?

A

	T	t
T	TT	Tt
t	Tt	tt

B

	T	T
T	TT	TT
t	Tt	Tt

C

	T	t
t	Tt	tt
t	Tt	tt

D

	T	T
t	Tt	Tt
t	Tt	Tt

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17. June/2023/Paper_0610/41/No.5b-d

(b) Explain why body cells can have different specialised functions even though they contain the same genes.

.....

.....

.....

.....

..... [2]

(c) Allele frequency in a population can be changed by natural selection and artificial selection.

State the meaning of the term allele.

.....

..... [1]

(d) Describe how artificial selection differs from natural selection.

.....

.....

.....

.....

.....

.....

..... [3]

18. March/2023/Paper_ 0610/12/No.33

In mice, the allele for black hair is dominant to the allele for brown hair.

Which proportion of offspring will have brown hair if a cross is made between a homozygous black mouse and a heterozygous black mouse?

A 0% **B** 25% **C** 50% **D** 100%

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19. March/2023/Paper_ 0610/22/No.32

In humans, what is the genotype of a red-green colour-blind male?

A X^RX^R **B** X^rX^r **C** X^RY **D** X^rY

20. March/2023/Paper_ 0610/32/No.3

Huntington's disease is a genetic disease caused by a mutation in a single gene.

The allele for Huntington's disease is dominant and is represented by the letter **H**.

The allele for **no** Huntington's disease is recessive and is represented by the letter **h**.

Fig. 3.1 is a pedigree diagram showing the inheritance of Huntington's disease in one family.

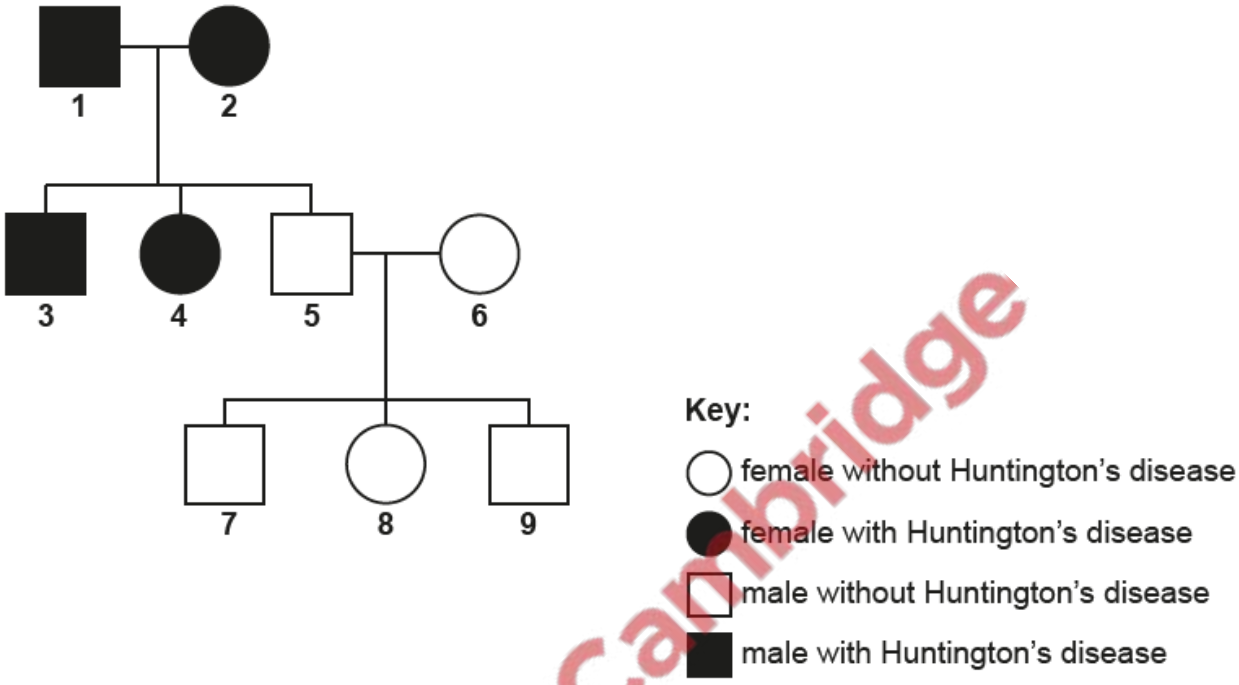

Fig. 3.1

(a) (i) State the number of males with Huntington's disease in Fig. 3.1.

..... [1]

(ii) State the **two** possible genotypes for person **3** in Fig. 3.1.

..... and .....

[2]

(iii) State the evidence from Fig. 3.1 that suggests that the allele for Huntington's disease is dominant.

.....

.....

..... [1]

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(b) A person that is heterozygous for Huntington's disease has a child with a person that is homozygous recessive.

Complete the Punnett square in Fig. 3.2 by writing in the gametes and offspring for this cross and calculate the percentage chance of the child inheriting Huntington's disease.

	.....	.....
.....	.....	.....
.....	.....	.....

Percentage chance of the child inheriting Huntington's disease .....

[3]

Fig. 3.2

(c) Chromosomes contain genetic information in the form of genes.

(i) Define the term gene.

.....

..... [2]

(ii) State where chromosomes are found in cells.

..... [1]

(iii) State the chromosomes involved in the inheritance of sex in humans.

..... [1]

[Total: 11]

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