

# 3.3 Inheritance

## Question Paper

Course	DPIB Biology
Section	3. Genetics
Topic	3.3 Inheritance
Difficulty	Medium

**Time allowed:** 20  
**Score:** /10  
**Percentage:** /100

**Question 1**

Through extensive experiments with pea plants, Gregor Mendel was able to show:

- I. The principles of inheritance.
- II. That purebred individuals could be cross-bred to produce a generation of offspring with identical phenotypes.
- III. That mutations within alleles could result in unexpected ratios of offspring.

- A** I only
- B** II only
- C** II and III
- D** I and II

[1 mark]

**Question 2**

How did Gregor Mendel ensure the reliability of his data?

- A** Repeating his investigation many times.
- B** Collecting large amounts of qualitative data.
- C** Making observations of a pea plant over many years.
- D** Completing a statistical test on his results.

[1 mark]

**Question 3**

Which statement best describes the cells produced as a result of meiosis?

- A** Haploid and genetically identical.
- B** Diploid and genetically identical.
- C** Haploid and genetically different.
- D** Diploid and genetically different.

[1 mark]

**Question 4**

A species of plant can have either blue or white flowers. The colour of the flower is controlled by a single gene where the dominant allele codes for blue flowers.

Two heterozygous plants are crossed; which of the observed outcomes matches up most accurately to the expected ratio of blue to white flowers.

	<b>Blue</b>	<b>White</b>
<b>A</b>	93	46
<b>B</b>	77	203
<b>C</b>	107	33
<b>D</b>	127	42

[1 mark]

**Question 5**

Two parents have an equal chance of having a child with blood groups A, B, AB, or O.

What are the genotypes of the parents?

- A** AB, AO
- B** AO, BO
- C** AB, OO
- D** AB, AB

[1 mark]

**Question 6**

A woman is a carrier of haemophilia; her husband does not have haemophilia.

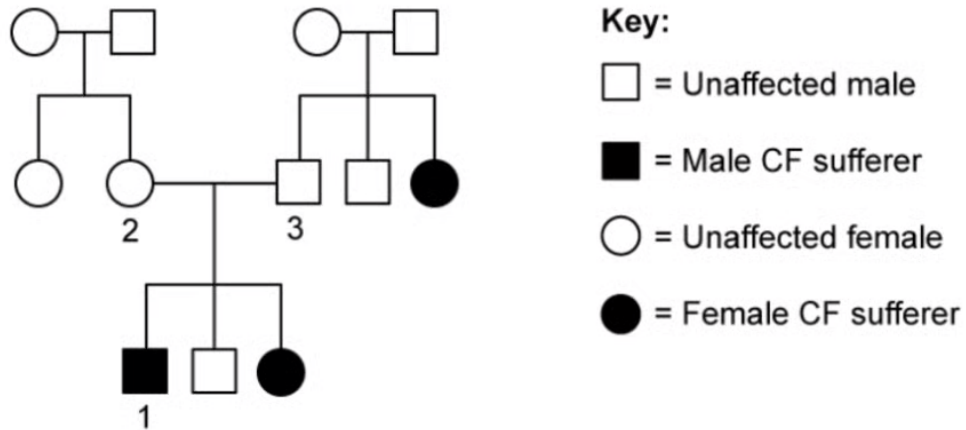
What are the possible genotypes of their children?

	<b>Sons</b>	<b>Daughters</b>
<b>A</b>	All sufferers	All carriers
<b>B</b>	Half healthy	All carriers
<b>C</b>	Half healthy	All healthy
<b>D</b>	Half healthy	Half carriers

[1 mark]

**Question 7**

The pedigree diagram shows the inheritance of cystic fibrosis across 3 generations.



Identify the genotype of the individuals labelled 1, 2 and 3 in the pedigree diagram.

	1	2	3
A	Heterozygous	Homozygous dominant	Heterozygous
B	Homozygous recessive	Homozygous dominant	Heterozygous
C	Homozygous recessive	Heterozygous	Heterozygous
D	Heterozygous	Homozygous recessive	Homozygous dominant

[1 mark]

**Question 8**

A couple are trying to decide whether their children may be at risk of inheriting Huntington's disease. One parent is heterozygous for Huntingtons and the other is a healthy individual.

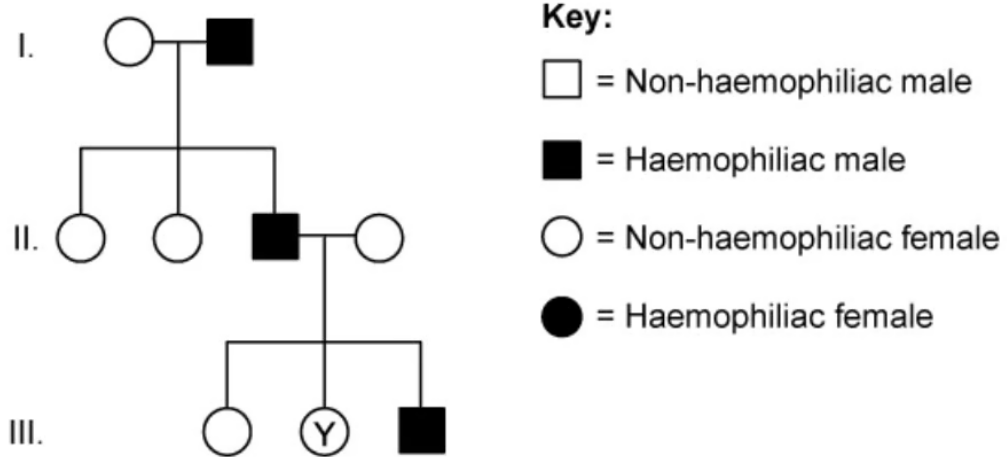
Calculate the % chance that their offspring are likely to suffer from the disease.

- A** 50%
- B** 25%
- C** 100%
- D** 75%

[1 mark]

**Question 9**

The pedigree diagram below shows the inheritance of haemophilia across three generations.



Identify the genotype of person Y.

- A  $X^hX^h$
- B  $X^HX^H$
- C  $X^HX^h$
- D  $X^HY$

[1 mark]

**Question 10**

Which of the following are mutagenic agents?

- A** X-rays, benzo(a)pyrene, radio waves
- B** X-rays, microwaves, radio waves
- C** X-rays, benzo(a)pyrene, gamma rays
- D** X-rays, benzo(a)pyrene, microwaves

[1 mark]