



Province of the
EASTERN CAPE
EDUCATION

**DIRECTORATE SENIOR CURRICULUM MANAGEMENT
(SEN-FET)
HOME SCHOOLING GRADE 12 LIFE SCIENCES INFORMAL TEST**

SUBJECT	LIFE SCIENCES	GRADE	12	DATE	24 April 2020
TOPIC	GENETICS	TERM 1 REVISION		TERM 2 CONTENT	✓

TIME: 1 HOUR

MARKS: 50

SECTION A

QUESTION 1

1.1 MULTIPLE-CHOICE QUESTIONS

Various options are given as possible answers to the following questions. Choose the correct answer and write only the letter (A – D) next to the question number (1.1.1. – 1.1.2) in the ANSWER BOOK, for example 1.1.3 D.

- 1.1.1 In humans, light hair colour is recessive to dark hair colour. In one family, the mother has dark hair, the father has light hair, one daughter has light hair and the other daughter has dark hair.

Which ONE of the following combinations best represents the genotypes for the mother and the daughter with dark hair?

- A mother DD, daughter DD
- B mother Dd, daughter Dd
- C mother DD, daughter Dd
- D mother Dd, daughter DD

- 1.1.2 In the tobacco plant, albinism (the inability to make chlorophyll) is a recessive trait. Two heterozygous tobacco plants were crossed and 300 seedlings were produced. What is the percentage chance that the seedlings will have albinism?

- A 75%
- B 300%
- C 50%
- D 25%

(2x2) **(4)**

1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question number (1.2.1 – 1.2.4) in your ANSWER BOOK.

1.2.1 The type of inheritance where two different alleles of a gene are expressed in the phenotype

1.2.3 A genetic cross involving only one characteristic

1.2.3 The position of a gene on a chromosome

1.2.4 A sex-linked disorder that affects the photoreceptors in the eye

(4x1) (4)

1.3 Indicate whether each of the descriptions in COLUMN I applies to **A ONLY**, **B ONLY**, **BOTH A AND B** or **NONE** of the items in COLUMN II. Write **A only**, **B only**, **both A and B** or **none** next to the question number (1.3.1 – 1.3.2) in the ANSWER BOOK.

COLUMN I	COLUMN II
1.3.1 The physical appearance of an organism due to its genetic composition	A Genotype B Phenotype
1.3.2 A sex-linked disorder	A Haemophilia B Down's Syndrome

(2x2) (4)

1.4 In fruit flies, the characteristic for body colour is either grey colour or black colour. A second characteristic is normal wings or vestigial wings. Vestigial wings are crumpled and therefore prevent flies from flying properly.

1.4.1 In a cross between a fly that is homozygous dominant for both traits and a fly that is homozygous recessive for both traits, all the offspring are grey with normal wings. Identify the ...

(a) dominant trait for body colour. (1)

(b) recessive trait for wing type. (1)

1.4.2 This is a cross describing two characteristics. What type of cross does it represent? (1)

1.4.3 Use the letters (**B**) for body colour and (**W**) for wings.

A fly is heterozygous for both traits. Give the ...

(a) genotype of the fly. (1)

(b) phenotype of the fly. (1)

(c) possible genotypes of the gametes that this fly can produce. (2)

(7)

TOTAL SECTION A: 19

SECTION B

QUESTION 2

2.1 Mr and Mrs Phonela are concerned that their baby girl does not appear to resemble either of them. They suspect that the baby they were given at the hospital was not theirs. Mr Phonela is blood type **AB**, Mrs Phonela is blood type **B** and the baby they were given is blood type **O**.

2.1.1 Give the possible genotypes of:

(a) Mrs Phonela (2)

(b) The baby girl (1)

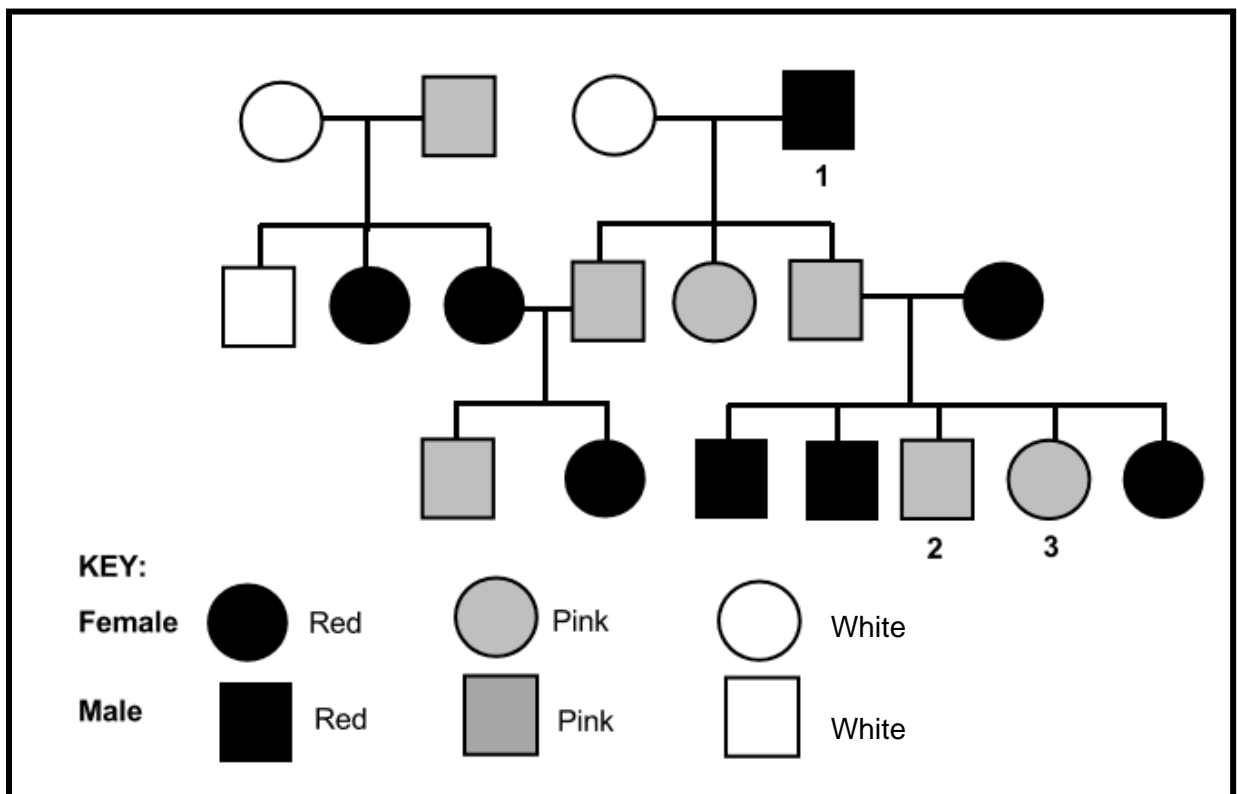
2.1.2 Explain why the baby girl with blood type **O** cannot be Mr and Mrs Phonela's daughter. (3)

2.1.3 Explain why the use of blood type for paternity testing is not conclusive. (2)

(8)

QUESTION 3

3.1 The diagram below shows the inheritance of coat colour in pigs through three generations.



3.1.1 What type of inheritance is shown in the pedigree diagram? (1)

3.1.2 Explain your answer to QUESTION 3.1.1 (2)

3.1.3 Use **R** for the allele for red coat colour and **W** for the allele for white coat colour to give the possible genotype/s of:

(a) Individual **1** (1)

(b) Individual **2** (1)

3.1.4 The pig farmer is interested in breeding pigs with red coats. He has a red-coated male pig that he wishes to use for breeding purposes. He crosses the pig with individual **3**.

Use a genetic cross to show the probability of the piglets being born with red coats.

(6)
(11)

TOTAL SECTION B: 19

SECTION C

QUESTION 4

Describe the three main types of inheritance using examples that shows the ratio of the phenotypes expressed in the first generation and second generation

Content: (9)
Synthesis: (3)

NOTE: NO marks will be allocated for answers in the form of flow charts, diagrams or tables.

TOTAL SECTION C: 12

GRAND TOTAL: 50