KWAZULU-NATAL PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

LIFE SCIENCES

PROVINCIAL STANDARDISED ASSESSMENT

MARCH 2026

MARKS: 100

TIME: 2 hours

This question paper consists of 13 pages.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer ALL the questions.
2. Write ALL the answers in the ANSWER BOOK.
3. Start the answers to each question at the top of a NEW page.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Present your answers according to the instructions of each question.
6. Do ALL drawings in pencil and label them in blue or black ink.
7. Draw diagrams, tables or flow charts only when asked to do so.
8. The diagrams in this question paper are NOT necessarily drawn to scale.
9. Do NOT use graph paper.
10. You may use a non-programmable calculator, protractor and a compass.
11. Write neatly and legibly.

Copyright reserved

SECTION A

QUESTION 1

1.1 Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A - D) next to the question number (1.1.1 to 1.1.6) in the ANSWER BOOK, for example 1.1.7 D.

1.1.1 Which ONE of the following is found only in RNA molecules?

A Guanine
B Uracil
C Thymine
D Adenine

1.1.2 Meiosis is significant for the ...

A production of haploid gametes.
B production of four diploid gametes.
C production of genetically identical gametes.
D doubling of the chromosome number.

1.1.3 The following is a list of parts in a male reproductive system:

(i) Seminal vesicle
(ii) Vas deferens
(iii) Prostate gland
(iv) Urethra

Which ONE of the following combinations is responsible for producing alkaline fluids and nutrients?

A (i), (ii) and (iv) only
B (i), (ii), (iii) and (iv)
C (ii) and (iv) only
D (i) and (iii) only

Copyright reserved

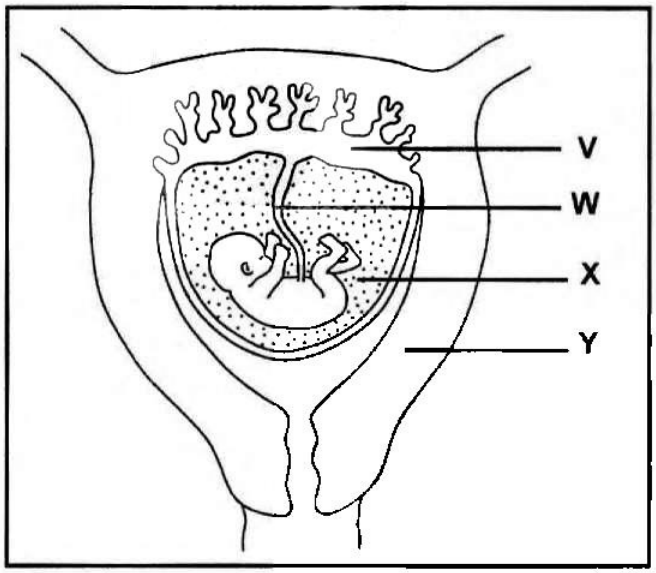
1.1.4 The table below shows amino acids coded for by different mRNA codons.

mRNA CODONS	AMINO ACIDS
GCG	Alanine
AUG	Methionine
AUA	Isoleucine
AGG	Arginine

Which amino acid is coded by the DNA base triplet TAC?

A Arginine
B Alanine
C Methionine
D Isoleucine

QUESTION 1.1.5 AND 1.1.6 ARE BASED ON THE DIAGRAM SHOWING A DEVELOPING FOETUS.



1.1.5 Which ONE of the following combinations is the CORRECT structure for each function?

	ALLOWS DIFFUSION OF NUTRIENTS TO THE FOETUS	ALLOWS FREE FOETAL MOVEMENT
A	X	W
B	V	Y
C	V	X
D	X	V

1.1.6 Which ONE of the following structures produces the hormone that thickens the endometrium?

A **V**
B **W**
C **X**
D **Y**

(6 × 2) **(12)**

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 to 1.2.5) in the ANSWER BOOK.

1.2.1 The natural shape of the DNA molecule

1.2.2 The point where adjacent chromatids of homologous chromosomes overlap during crossing over

1.2.3 The release of an ovum from the ovary

1.2.4 Division of the cytoplasm

1.2.5 A blood vessel that transports deoxygenated blood from the foetus to the mother

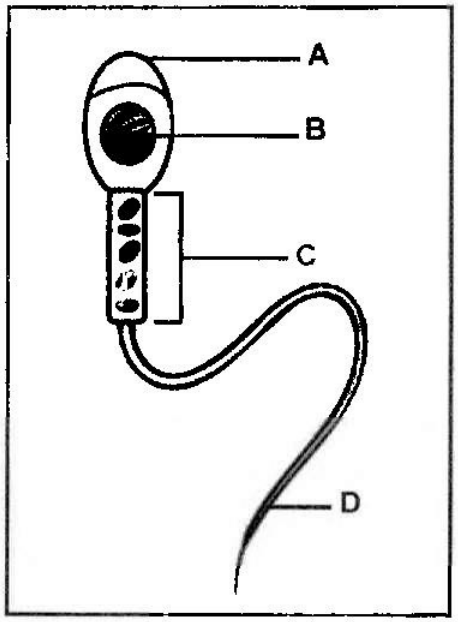
(5 x 1) **(5)**

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 to 1.3.3) in the ANSWER BOOK.

	COLUMN I	**COLUMN II**
1.3.1	The structure where testosterone is produced	A: Epididymis B: Cowper's gland
1.3.2	A hollow ball of cells that implants in the endometrium	A: Blastocyst B: Morula
1.3.3	Location of a DNA molecule in the plant cell	A: Mitochondria B: Chloroplast

(3 x 2) **(6)**

1.4 The diagram below shows a sperm cell.



1.4.1 Identify part:

(a) **C** (1)

(b) **D** (1)

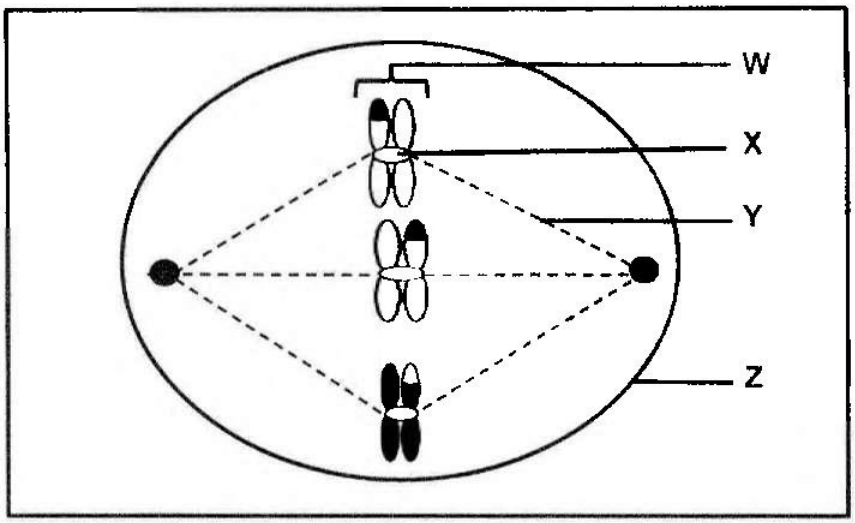
1.4.2 Give the LETTER and NAME of the part that contains the:

(a) Genetic material (2)

(b) Enzymes to penetrate the egg layers (2)

(c) Organelle that provides energy for sperm motility (2)
(8)

1.5 The diagram below represents a cell in a phase of meiosis.



1.5.1 Identify part:

(a) **W** (1)

(b) **Y** (1)

(c) **Z** (1)

1.5.2 Give the LETTER and **NAME** for the part responsible for joining two chromatids together. (2)

1.5.3 Name the part in a flower where meiosis occurs to produce male gametes. (1)

1.5.4 How many chromosomes:

(a) Were there in this cell at the beginning of meiosis (1)

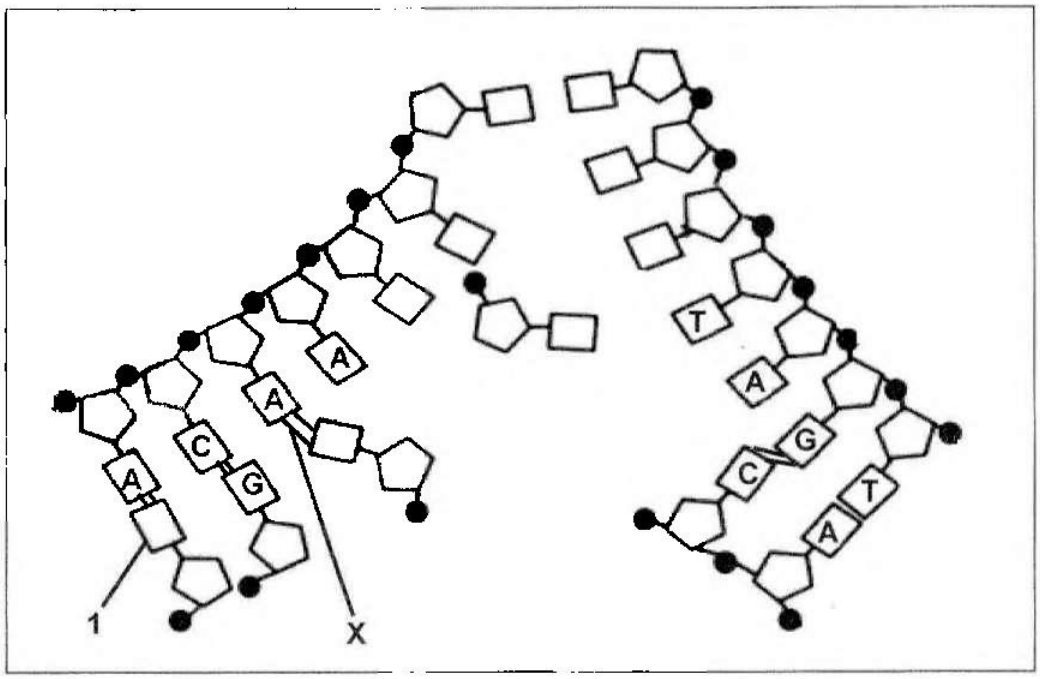
(b) Will be found in this cell at the end of meiosis (1)

1.5.5 Identify the phase of cell division represented in the diagram. (1)
(9)

TOTAL SECTION A: 40

QUESTION 2

2.1 The diagram below represents a process in a cell.



2.1.1 Identify:

(a) Bond **X** (1)

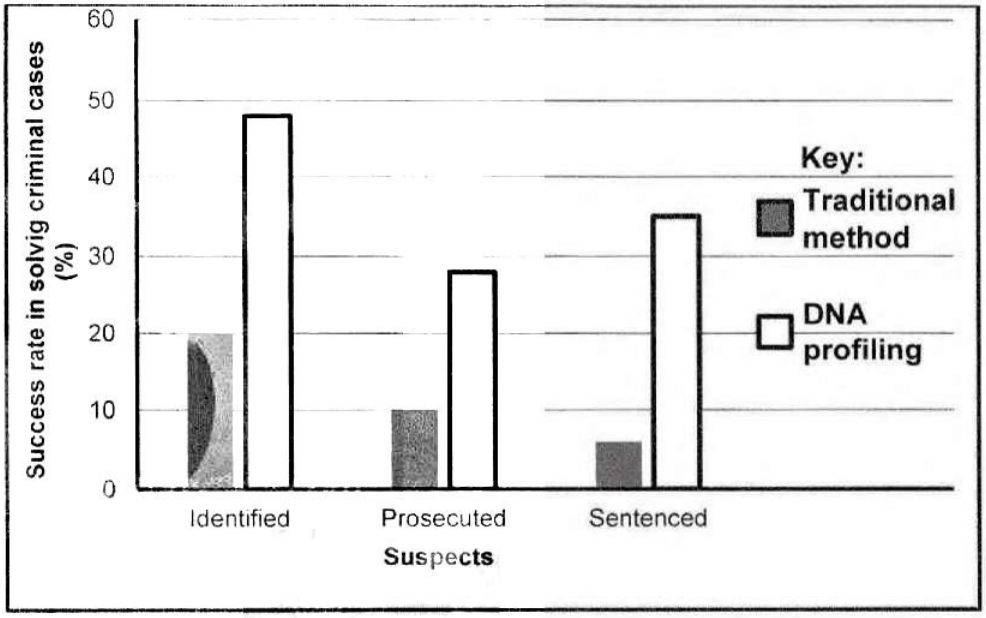
(b) Nitrogenous base **1** (1)

2.1.2 Name the process shown in the diagram. (1)

2.1.3 State ONE importance of the process named in QUESTION 2.1.2. (1)

2.1.4 Tabulate TWO differences between transcription and the process named in QUESTION 2.1.2. (5)
(9)

2.2 The graph below shows the percentage success rate in solving criminal cases using traditional method and DNA profiling.



2.2.1 Give TWO other uses of DNA profiling other than the one shown in the graph. (2)

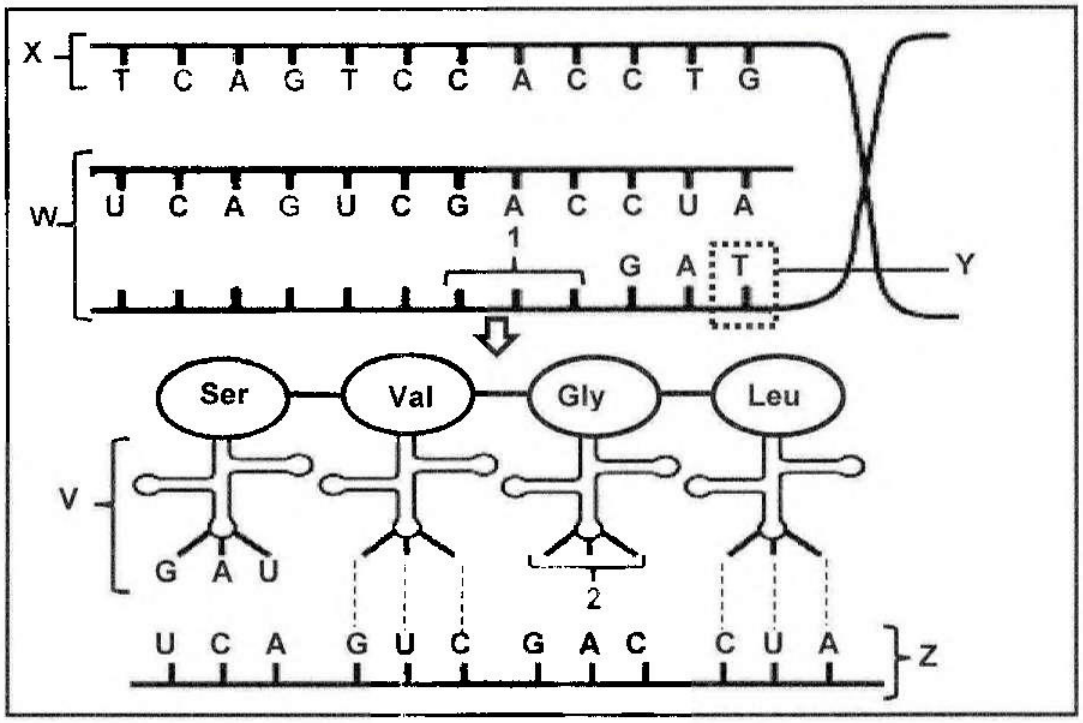
2.2.2 State the percentage of suspects:

(a) Sentenced using DNA profiling (1)

(b) Prosecuted using traditional method (1)

2.2.3 Explain how the DNA profiling is used in identifying criminals. (3)
(7)

2.3 The diagram below represents a part of protein synthesis.



2.3.1 Identify:

(a) The stage of protein synthesis represented by **W** (1)

(b) The amino acid coded by DNA base triplet CAG (1)

2.3.2 State ONE structural difference between molecule **X** and molecule **Z**. (2)

2.3.3 Give the sequence of nitrogenous bases at triplet:

(a) **1** (1)

(b) **2** (1)

2.3.4 Cytosine **(C)** in point **Y** is replaced by thymine **(T)** as a result of a mutation.

Explain how this mutation affected the protein formed. (3)

2.3.5 Describe the process of translation. (5)
(14)
[30]

QUESTION 3

3.1 Down syndrome is a condition caused by non-disjunction in humans during cell division.

The table below shows the effect of maternal age on the incidence of Down syndrome babies per 1 000 mothers.

MATERNAL AGE (YEARS)	INCIDENCE OF DOWN SYNDROME BABIES PER 1 000 MOTHERS
25	0.8
30	1
35	2.5
40	10
45	25

3.1.1 Name the phase of meiosis where non-disjunction occurs. (1)

3.1.2 Describe the relationship between the maternal age and incidence of Down syndrome babies per 1 000 mothers. (2)

3.1.3 Calculate the percentage increase in the incidence of Down syndrome babies between the maternal ages 35 and 45. Show ALL working. (3)

3.1.4 Draw a bar graph to show the results in the table. (6)
(12)

3.2 Frogs, birds and other fish have different survival rate of offspring.

The survival rate of offspring per eggs produced in some fish, chicken and frog was determined.

The table below shows the survival rate in different organisms.

ORGANISM	SURVIVAL RATE IN DIFFERENT ORGANISMS
Fish	1 – 5 per 1 000 eggs
Chicken	100 – 150 per 250 eggs
Frog	6 – 10 per 1 000 eggs

3.2.1 Define the term *Ovipary*. (2)

3.2.2 Using the table, name the organism that has the:

(a) Lowest survival rate (1)

(b) Highest survival rate (1)

3.2.3 Explain:

(a) Why frogs are expected to produce a large number of gametes (2)

(b) The advantage of internal fertilisation in chickens (2)
(8)

3.3 Clomid (a certain type of drug that stimulates ovulation) is a treatment for women struggling with infertility.

Scientists investigated the effect of clomid treatment on the FSH level in women with infertility.

The procedure was as follows:

- 16 females of the same age who were struggling with the same form of infertility were asked to participate in the investigation.
- The females were divided into two groups of 8 each.
- The FSH level of participants was measured before the use of clomid treatment.
- The participants in Group **A** received clomid treatment at a daily dosage of 50 mg for 5 consecutive days from day 5 – 9 of the menstrual cycle.
- The participants in Group **B** did not receive the clomid treatment.
- The level of FSH was measured and recorded daily.
- This procedure was done over a period of 5 months.
- The average level of FSH was calculated for each group at the end of the investigation.

The average FSH level in Group **A** was 14 mIU/mL more than that in Group **B**.

3.3.1 State the independent variable of this investigation. (1)

3.3.2 List TWO variables that were kept constant and which contributed to the validity of the investigation. (2)

3.3.3 Give ONE reason why the FSH level of participants was measured before the use of clomid treatment. (1)

3.3.4 State TWO ways in which the scientists ensured the reliability of the investigation. (2)

3.3.5 Explain the:

(a) Purpose of Group **B** in this investigation (2)

(b) Effect of clomid treatment in females struggling with infertility (2)

(10)
[30]

TOTAL SECTION B: 60
GRAND TOTAL: 100

Copyright reserved