KWAZULU-NATAL PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA

MSTANDARDISED PROVINCIAL ASSESSMENT

GRADE 10

LIFE SCIENCES

PROVINCIAL STANDARDISED ASSESSMENT

MARCH 2026

MARKS: 75

TIME: 1½ Hours

NB: This question paper consists of 11 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.

SECTION A

QUESTION 1

1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.5) in your ANSWER BOOK, for example 1.1.6 D.

1.1.1 The structure that splits into two centrioles during cell division is a…

A Spindle fibres.
B centromere.
C centriole.
D centrosome.

1.1.2 Which of the following is a function of a ribosome?

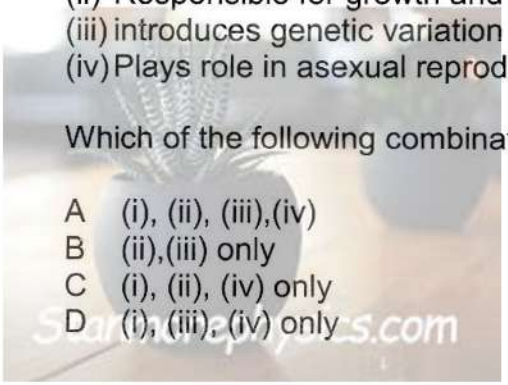
A Responsible for photosynthesis
B Serves as a site of protein synthesis
C Formation of lipids
D Forms spindle fibres

1.1.3 The following is a list of importances of cell division

(i) Repair and replaces damaged or dead tissues
(ii) Responsible for growth and development
(iii) introduces genetic variation
(iv) Plays role in asexual reproduction

Which of the following combinations are the importances of mitosis?

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



1.1.4 Identify the phase in which the DNA makes exact copies of itself

A Metaphase
B Telophase
C Anaphase
D Interphase

1.1.5 Which of the following is CORRECT about osmosis?

A Water moves from high water potential area to low water potential area through a selectively permeable membrane
B Water moves from low water potential area to high water potential area stanmorephysics.com
C Water moves from high water potential area to low water potential area
D Water moves from low water potential area to low water potential through an impermeable cell membrane

2x5 **(10)**

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 your ANSWER BOOK.

1.2.1 Structure that connects two chromatids together

1.2.2 Plastid that contains colourless pigment

1.2.3 A phase in mitosis where chromosomes become visible

1.2.4 Part of the microscope that supports the stage and is used to carry the microscope

1.2.5 Membrane surrounding a vacuole

1x5 **(5)**

1.3 Indicate whether each of the statements 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 1.3.2) in the ANSWER BOOK.

	COLUMN I	COLUMN II
1.3.1	Contain digestive enzymes	A: Chromoplast B: Lysosomes
1.3.2	Provide support and rigidity to the cell	A: Cell wall B: Cell membrane

2x2 **(4)**

1.4 A learner carried out three food tests on samples of peanuts, apple and potato. The following table shows the results of the tests that were carried out.

On the table, a tick (✓) shows a **POSITIVE** result and a cross (**x**) shows a **NEGATIVE** results.

TEST	CHEMICAL REAGENT	PEANUT	APPLE	POTATO
P	Iodine solution	✓	✓	✓
Q	Fehlings A and B OR Benedicts solution	**X**	✓	**X**
R	Ether OR alcohol	✓	**X**	**X**

1.4.1 Identify Which food test was carried out at:

(a) **P** (1)

(b) **Q** (1)

(c) **R** (1)

1.4.2 State the colour change at the end of testing:

(a) An apple sample in test **Q** (1)

(b) A potato sample in test **P** (1)

1.4.3 Name the chemical reagent that is used to test for proteins (1)
(6)

TOTAL SECTION A 25

SECTION B

QUESTION 2

2.1 Read the extract below

CANCER- MITOSIS GONE WRONG

Colorectal cancer, also called colon cancer or large bowel cancer, includes cancerous growths in the colon, rectum and appendix. Colorectal cancer is the type of cancer that affects the colon (large intestine) and rectum. stanmorephysics.com

With 655 000 deaths worldwide per year, it is the third most common form of cancer and the second leading cause of cancer-related deaths in the Western world. These mushroom-shaped growths are usually benign, but some may develop into cancer over time.

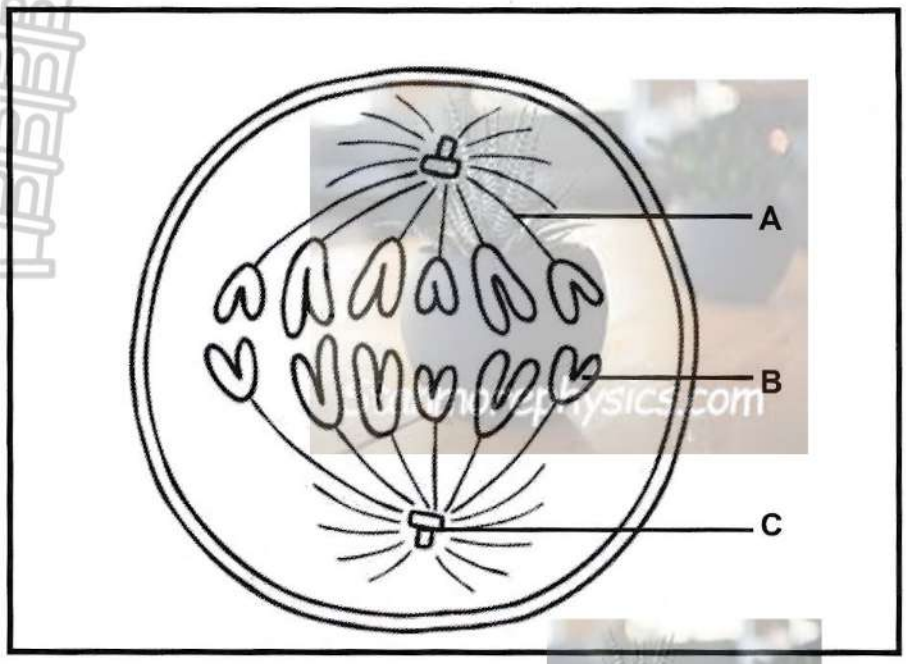
Most of the time, the diagnosis of localized colon cancer is through a colonoscopy. Therapy is usually through surgery, which in many cases is followed by chemotherapy.

2.1.1 Define the colorectal cancer (1)

2.1.2 Explain the statement that cancer is 'mitosis gone wrong' (2)

2.1.3 State TWO ways of treating cancer mentioned in the extract above. (2)
(5)

2.2 The diagram below shows an anaphase of mitosis



2.2 2.2.1 Identify part:

(a) **A** (1)

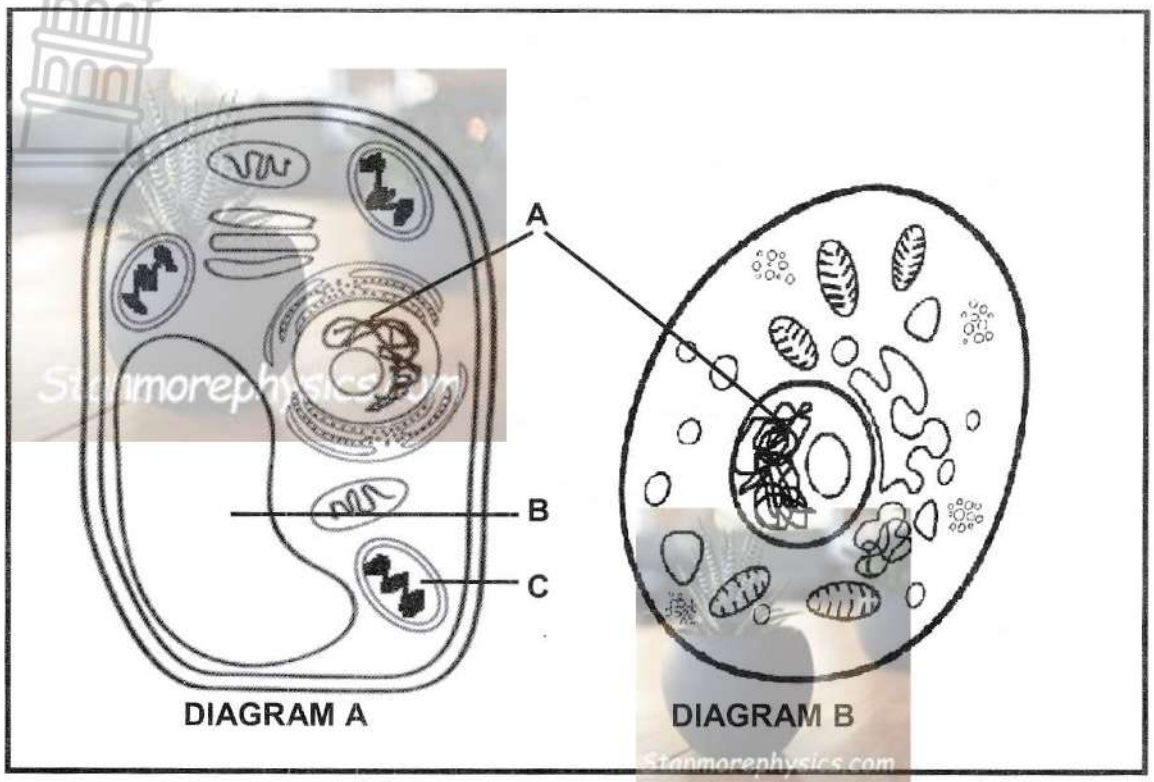
(b) **B** (1)

2.2.2 Explain the results if part **C** is not present in this cell (2)

2.2.3 State how many chromosomes will be present in each cell at the end of this cell division (1)

2.2.4 Describe the events that occurred in the phase before the phase shown above. (2)
(7)

2.3 The diagrams below show two types of cells



2.3.1 Give:

(a) ONLY the LETTER and NAME of the part that carries genetic material (2)

(b) TWO organic compounds that are found inside part **B** (2)

2.3.2 Tabulate TWO differences between **DIAGRAM A** and **DIAGRAM B** (5)

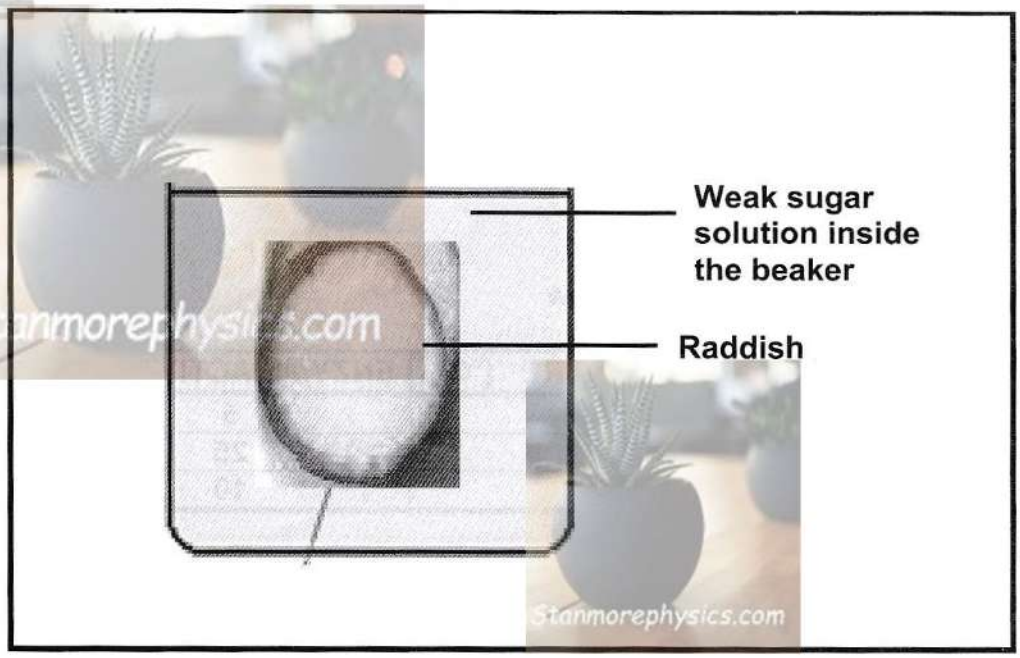
2.3.3 Explain the effect a decrease of organelle **C** will have on animals (4)

(13)

TOTAL QUESTION 2 25

QUESTION 3

3.1 The diagram below shows the process of diffusion between a weak sugar solution and raddish (vegetable) cut in a cross section.



3.1.1 Identify the type of diffusion shown above (1)

3.1.2 Will the mass of the raddish vegetable decrease or increase after two hours? (1)

3.1.3 Explain your answer to QUESTION 3.1.2 (4)

3.1.4 It has been observed that the cell membranes of the raddish plant became impermeable. Explain how this will affect the plant (2)
(8)

3.2 Rennin is an enzyme found in the stomach of mammals, and its function is to solidify milk. An investigation was conducted to determine the effect of temperature on enzyme activity of rennin stanmorephysics.com

The procedure was as follows:

- 3 test tubes, each with a volume of 10 cm^3, were numbered 1 to 3
- A visible mark was made 2 cm from the bottom of each test tube, and each tube was filled with milk up to the 2 cm mark.
- 3 ml of rennin was added to each test tube, and the tubes were kept for 15 minutes at different temperatures
- Test tube 1: 10°C
- Test tube 2: 37°C
- Test tube 3: 50°C

The results are shown in the table below

TEST TUBES	TEMPERATURE (°C)	ENZYME ACTIVITY/S
1	10	5
2	37	25
3	50	10

3.2.1 Identify:

(a) Independent variable (1)

(b) Dependent variable (1)

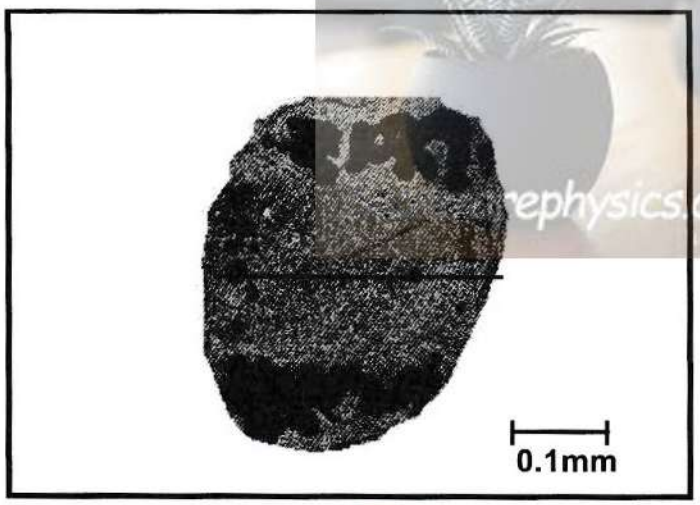
3.2.2 37°C is an optimum for the enzyme activity, define the term optimum (1)

3.2.3 Give TWO ways in which the validity of the investigation was ensured (2)

3.2.4 Explain why enzyme activity decreased after 37°C (3)

3.2.5 Draw a line graph to represent the enzyme activity at different temperatures . (6)
(14)

3.3 The diagram below shows a specimen of early telophase viewed under electron microscope.



Use the scale line provided to find the width of the specimen along the plane indicated by the solid line. Show ALL your workings.

Use the formula:

Actual size = measured size of the specimen x scale line given ÷ length of the scale line (3)

TOTAL QUESTION 3	**[25]**
TOTAL SECTION B	**50**
GRAND TOTAL	**75**

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FINAL

STANDARDISED PROVINCIAL ASSESSMENT

GRADE 10

LIFE SCIENCES

MARCH 2026

MARKING GUIDELINE

Marks: 75

N.B This marking guideline consist of 7 pages.

PRINCIPLES RELATED TO MARKING LIFE SCIENCES

1. **If more information than marks allocated is given**
   Stop marking when maximum marks is reached and put a wavy line and 'max' in the right-hand margin.

2. **If, for example, three reasons are required and five are given**
   Mark the first three irrespective of whether all or some are correct/incorrect.

3. **If whole process is given when only a part of it is required**
   Read all and credit the relevant part.

4. **If comparisons are asked for but descriptions are given**
   Accept if the differences/similarities are clear.

5. **If tabulation is required but paragraphs are given**
   Candidates will lose marks for not tabulating.

6 **If diagrams are given with annotations when descriptions are required**
   Candidates will lose marks.

7. **If flow charts are given instead of descriptions**
   Candidates will lose marks.

8. **If sequence is muddled and links do not make sense**
   Where sequence and links are correct, credit. Where sequence and links are incorrect, do not credit. If sequence and links become correct again, resume credit.

9. **Non-recognised abbreviations**
   Accept if first defined in answer. If not defined, do not credit the unrecognised abbreviation but credit the rest of the answer if correct.

10 **Wrong numbering**
   If answer fits into the correct sequence of questions but the wrong number is given, it is acceptable.

11. **If language used changes the intended meaning**
   Do not accept.

12. **Spelling errors**
   If recognisable, accept the answer, provided it does not mean something else in Life Sciences or if it is out of context.

13. **If common names are given in terminology**
   Accept, provided it was accepted at the national memo discussion meeting.

14. **If only the letter is asked for but only the name is given (and vice versa), DO NOT credit.**

15. **If units are not given in measurements**
Candidates will lose marks. Memorandum will allocate marks for units separately.

16. **Be sensitive to the sense of an answer, which may be stated in a different way.**

17. **Caption**
All illustrations (diagrams, graphs, tables, etc.) must have a caption.

18. **Code-switching of official languages (terms and concepts)**
A single word or two that appear(s) in any official language other than the learners' assessment language used to the greatest extent in his/her answers should be credited if it is correct. A marker that is proficient in the relevant official language should be consulted. This is applicable to all official languages.

SECTION A

QUESTION 1

1.1 1.1.1 D ✓✓
1.1.2 B ✓✓
1.1.3 C ✓✓
1.1.4 D ✓✓
1.1.5 A ✓✓

2X5 **(10)**

1.2 1.2.1 Centromere ✓
1.2.2 Leucoplast ✓
1.2.3 Prophase ✓
1.2.4 Arm✓
1.2.5 Tonoplast ✓

1x5 **(5)**

1.3 1.3.1 B only✓✓
1.3.2 A only✓✓

2x2 **(4)**

1.4 1.4.1 (a) Starch ✓ (1)
(b) Glucose✓ (1)
(c) Lipids ✓ (1)

1.4.2 (a) Bright orange✓/yellow/ orange (1)
(b) Blue-black✓/ purplish black/ black (1)

1.4.3 Millon's reagent✓Burette solution (1)
(6)

TOTAL SECTION A 25

SECTION B

QUESTION 2

2.1 2.1.1 Cancer that affects the colon and rectum ✓ (1)

2.1.2 Refers to the large growth of cells✓due to uncontrolled abnormal cell division.✓ (2)

2.1.3 - Surgery✓
- Chemotherapy✓

Mark the first TWO (2)
(5)

2.2.1 (a) Spindle fibres✓ (1)
(b) Chromatid✓ (1)

2.2.2 - Spindle fibres will not form✓
- chromosomes will not be able to attach✓/Centromere will not be able to attach.
- and will not move to opposite poles ✓ (2)
- 6✓/six

Any

2.2.3 (1)

2.2.4 -Chromosomes are arranged along the equator✓
-Attaching to spindle fibres by centromeres✓ (2)
(7)

2.3 2.3.1 (a) A✓- Chromatin network✓ (2)
(b) Carbohydrates✓/sugar, proteins✓/ amino acids (2)
Mark the first TWO

2.3.2

Diagram A/ plant cell	**Diagram B/ animal cell**
Have cell wall✓	No cell wall present✓
Has large vacuole ✓	Has small vacuoles✓
Chloroplast present ✓	No chloroplast present✓

Mark the first TWO **Any** (2x 2)+(1)table✓ (5)

2.3.3 - Rate of photosynthesis will be low✓
- Leading to low production of starch✓
- Thus less food available for animals✓
- Leading to starvation and death of some animals✓ (4)
(13)

TOTAL QUESTION 2 **[25]**

QUESTION 3

3.1 3.1.1 Osmosis✓/ endosmosis (1)

3.1.2 Increase ✓ (1)

3.1.3
- Solution in beaker has less solutes than the raddish✓/vegetable
- Therefore, it has high water potential✓
- The water will diffuse from the weak solution✓ in the beaker into the raddish vegetable✓
- Through a selectively permeable cell membrane of the vegetable✓

Any (4)

3.1.4
- Water will not enter or leave the cells of the raddish plant✓
- And other important essential nutrients will not be taken in✓
- Waste will also not be taken out of the cell✓
- Leading to death of the plant ✓

Any (2)
(8)

3.2.1 (a) Temperature ✓ (1)
(b) Enzyme activity✓ /Enzyme activity of Rennin (1)

3.2.2 The highest level of activity an enzyme can reach ✓/work at its best (1)

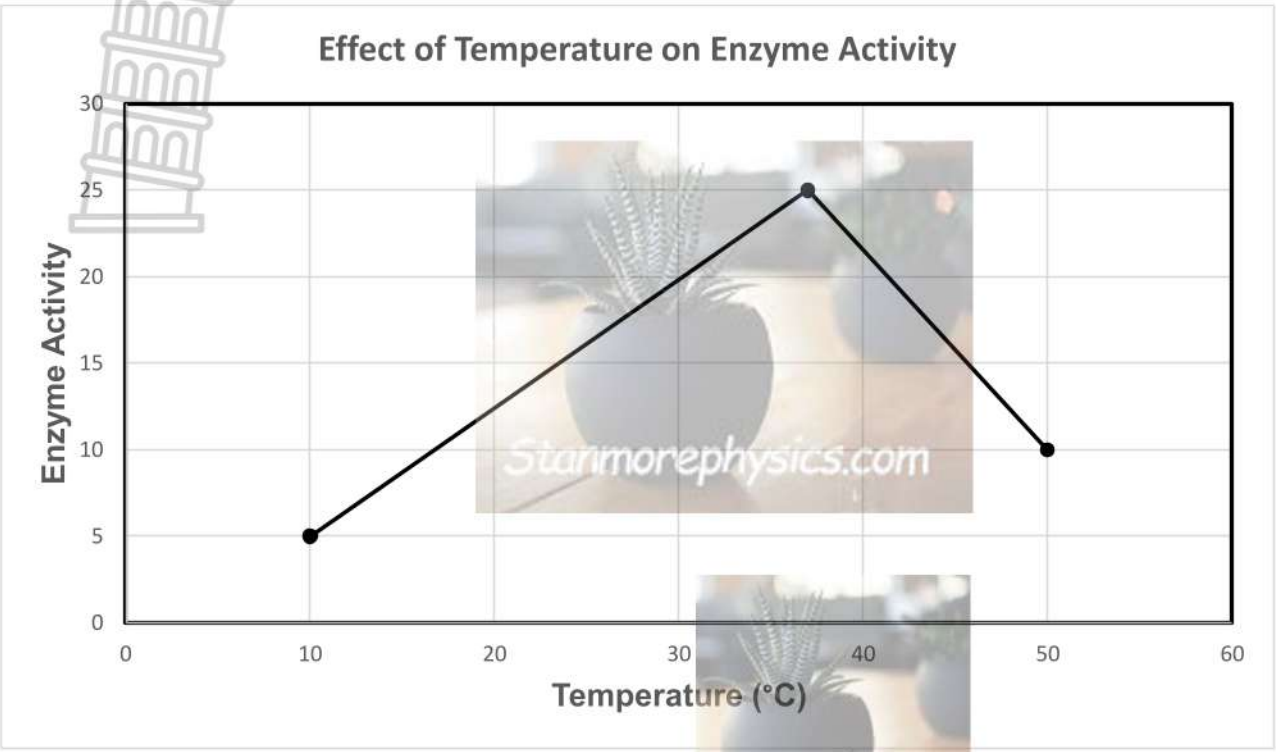
3.2.3
- A volume of 10cm^3 was used in each test tube✓
- 2 cm mark in each test tube✓
- Equal amount of milk✓
- 3ml of rennin was added in each test tube✓
- 15 minutes was given in each test tube✓

Mark the first TWO only (2)

3.2.4
- Enzymes denatures at high temperature✓
- They lose their shape✓
- Substrate no longer fit into an enzyme active site✓
- Resulting in low activity ✓

Any (3)

3.2.5



Marking Rubric:

Criteria	Mark Allocation
Correct type of graph **(T)**	1
Caption of the graph includes both variables**(C)**	1
Correct labels for X-and Y- axis and correct units (**L)**	1
Scale in both X and Y and axis **(S)**	1
Correct plotting **(P)** 1- 2 points plotted All 3 points plotted	 1 2

(6)
(14)

3.3 Actual size = $\frac{39x0.1}{13}$ mm✓

= 0.3✓ mm✓

(3)
[25]

TOTAL SECTION B **50**
GRAND TOTAL **75**