



KWAZULU-NATAL PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 11

LIFE SCIENCES

JUNE EXAMINATION

2025

MARKS: 150

TIME: 2½ hours

N.B. This question paper consists of 17 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.

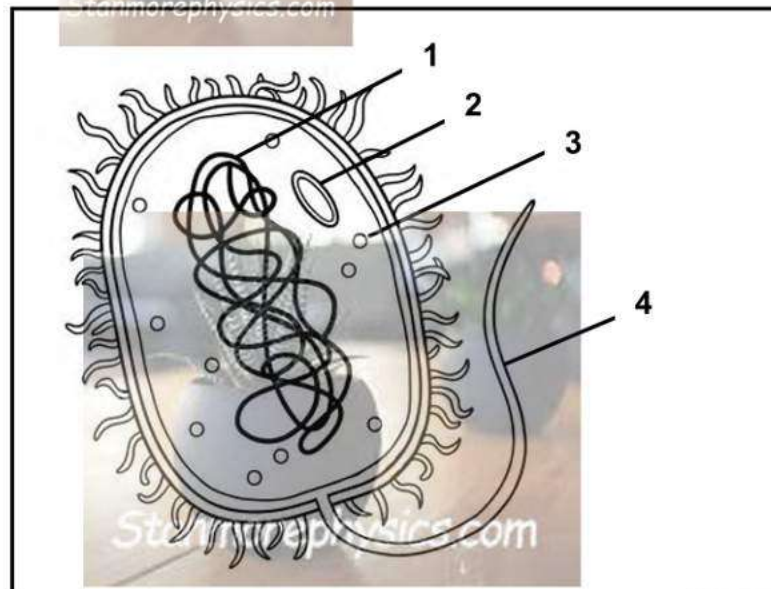
SECTION A**QUESTION 1**

- 1.1 Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A – D) next to the question numbers (1.1.1 to 1.1.8) in the ANSWER BOOK, e.g. 1.1.9 D.

1.1.1 The function of hydrogen atoms during oxidative phosphorylation is to...

- A break down activated glucose to form carbon molecules.
- B combine with carbon dioxide to form oxygen.
- C react with ADP to form ATP.
- D combine with carbon dioxide to form carbonic acid.

QUESTION 1.1.2 AND 1.1.3 ARE BASED ON THE DIAGRAM BELOW



1.1.2 During biotechnology the part that is used to produce a hormone that decreases glucose level in blood:

- A 1
- B 2
- C 3
- D 4

1.1.3 The visible feature that classifies the above diagram as prokaryote is the...

- A absence of both cell membrane and definite nucleus.
- B presence of definite nucleus.
- C presence of cell membrane.
- D absence of definite nucleus.

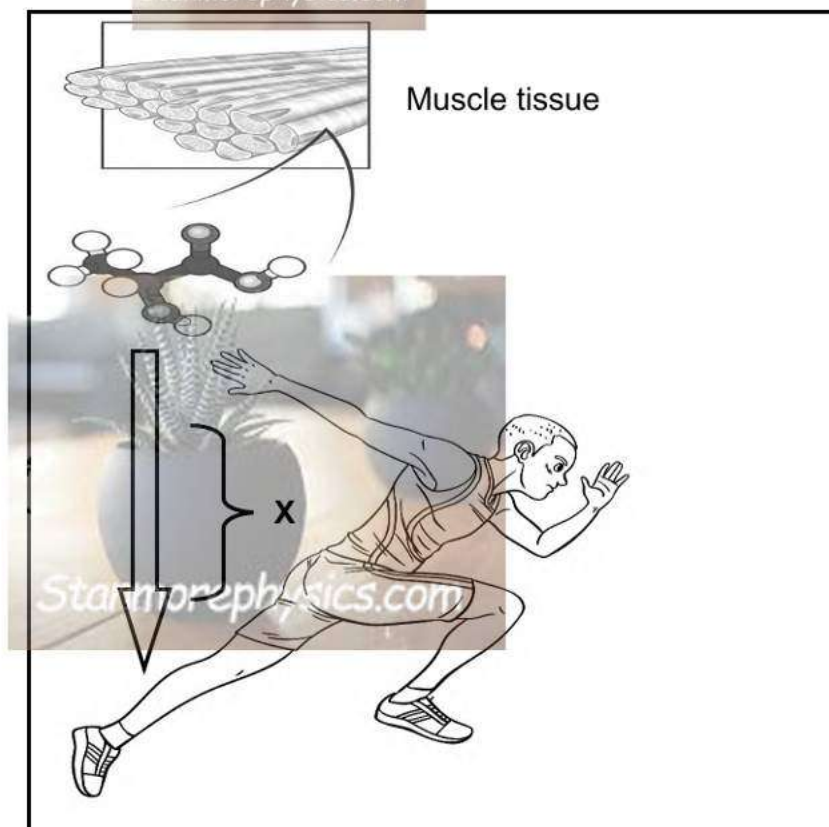
1.1.4 Below is a list of characteristics of a flower.

- (i) Flowers are usually small without petals
- (ii) They produce a small amount of pollen grain
- (iii) Pollen grains are light, smooth and dry
- (iv) The stigma is large and feathery

Which ONE of the following is a CORRECT combination of characteristics of wind pollinated flowers?

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

1.1.5 The diagram below shows a muscle tissue of an athlete during comrade marathon.



Which ONE of the following statements describe what happens in the muscle at point X during anaerobic respiration?

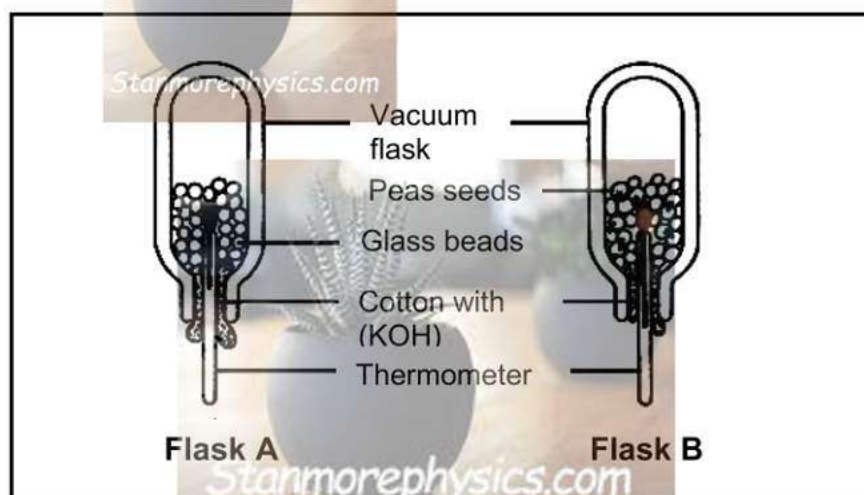
- A Lactic acid level decreases
- B ATP level increases
- C Lactic acid level increases
- D Glucose level increases

1.1.6 The table below shows gases released and product formed.

Which ONE of the following best describes the type of gas released and product formed during light reaction of photosynthesis?

	Gas released	Product
A	Carbon dioxide	Hydrogen
B	Oxygen	Hydrogen
C	Hydrogen	Carbon dioxide
D	Carbon dioxide	Oxygen

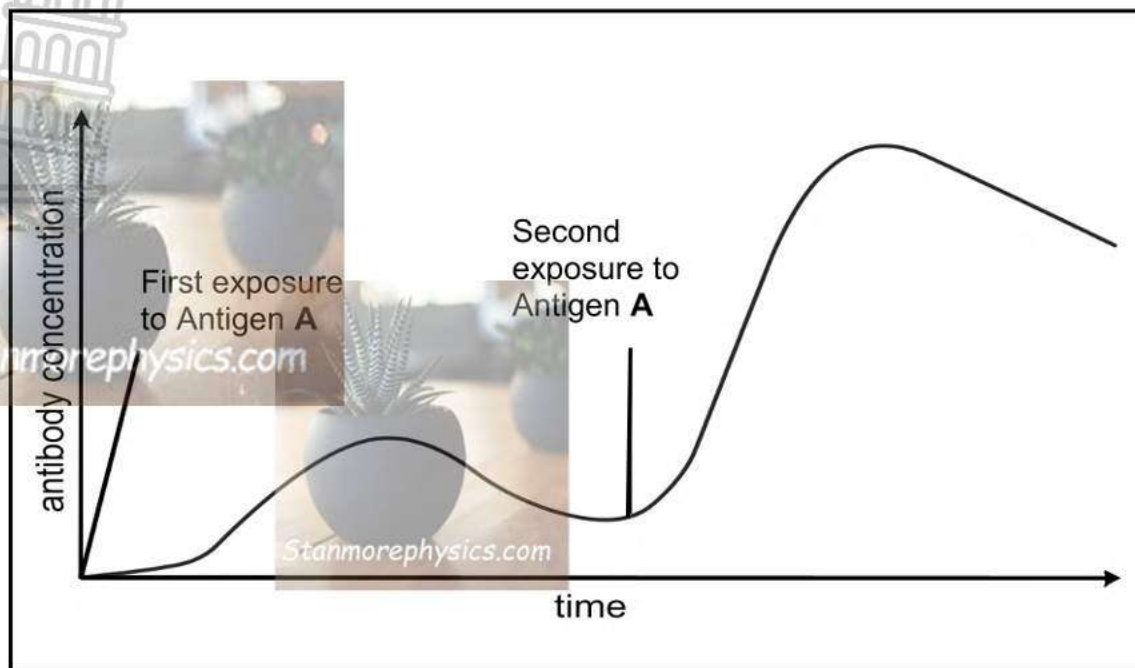
1.1.7 The diagram below shows apparatus used in germination of seeds during cellular respiration.



Which ONE of the following is a suitable control for this investigation?

- A **Flask A** has glass beads, cotton with (KOH) and thermometer
- B **Flask A** has cotton wool with KOH and thermometer
- C **Flask B** has many peas seeds and thermometer.
- D **Flask B** has peas seeds instead of glass beads.

1.1.8 The graph below shows antibodies concentration that are present in the body after exposure to Antigen **A**.



Which ONE of the following statements is CORRECT regarding antibody concentration at different times of exposure to Antigen **A**?

- A First exposure to Antigen **A** and second exposure results in same antibody concentration.
- B Both times of exposure to Antigen **A** have no effect in antibody concentration.
- C First exposure to Antigen **A** stimulate the antibody concentration more than the second exposure.
- D Second exposure to Antigen **A** stimulate the antibody concentration more than the first exposure.

(8 x 2) (16)

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 1.2.9) in the ANSWER BOOK.

1.2.1 The blood vessel that transports absorbed nutrients from the small intestine to the liver

1.2.2 A digestive cavity which has one digestive opening

1.2.3 Finger like projections in the small intestine that increases surface area for absorption.

1.2.4 Flap-like structure which prevents food from entering the trachea

1.2.5 Germ layer responsible for the development of epithelial lining of the digestive tract

1.2.6 Group of plants that produce seeds

1.2.7 Ability of the body to maintain an internal environment constant despite changes in the external environment

1.2.8 Process where protozoa engulf and digest large food particles

1.2.9 Part of a flower which become a fruit after fertilisation

1.2.10 The amount of extra oxygen the body needs to recover from strenuous exercise

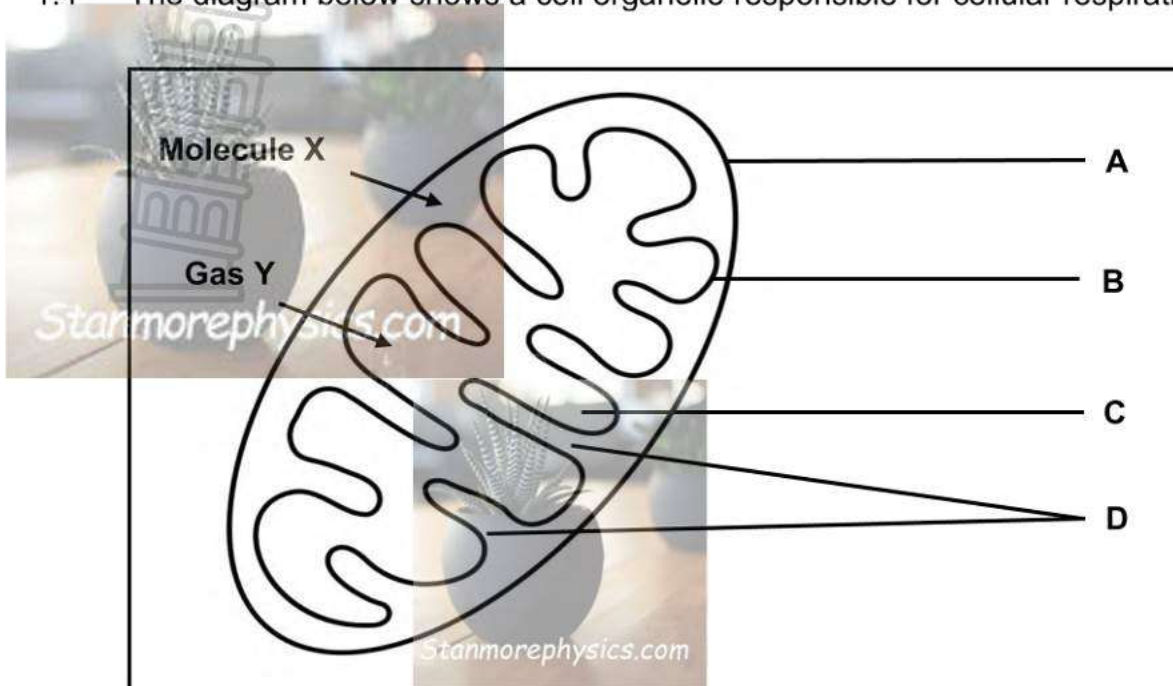
(10 x 1) **(10)**

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	Triploblastic organism	A: Cnidaria B: Porifera
1.3.2	Produces antibodies	A: Lymphocytes B: Red blood corpuscles
1.3.3	Secrete hydrochloric acid	A: Gall bladder B: Stomach

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

1.4 The diagram below shows a cell organelle responsible for cellular respiration.



1.4.1 Identify:

- (a) Part **A** (1)
- (b) **Gas Y** (1)
- (c) **Molecule X** (1)

1.4.2 Give the LETTER and NAME of the part that:

- (a) Contains enzymes responsible for production of energy carriers (2)
- (b) Is folded to increase the surface area for attachment of enzymes (2)

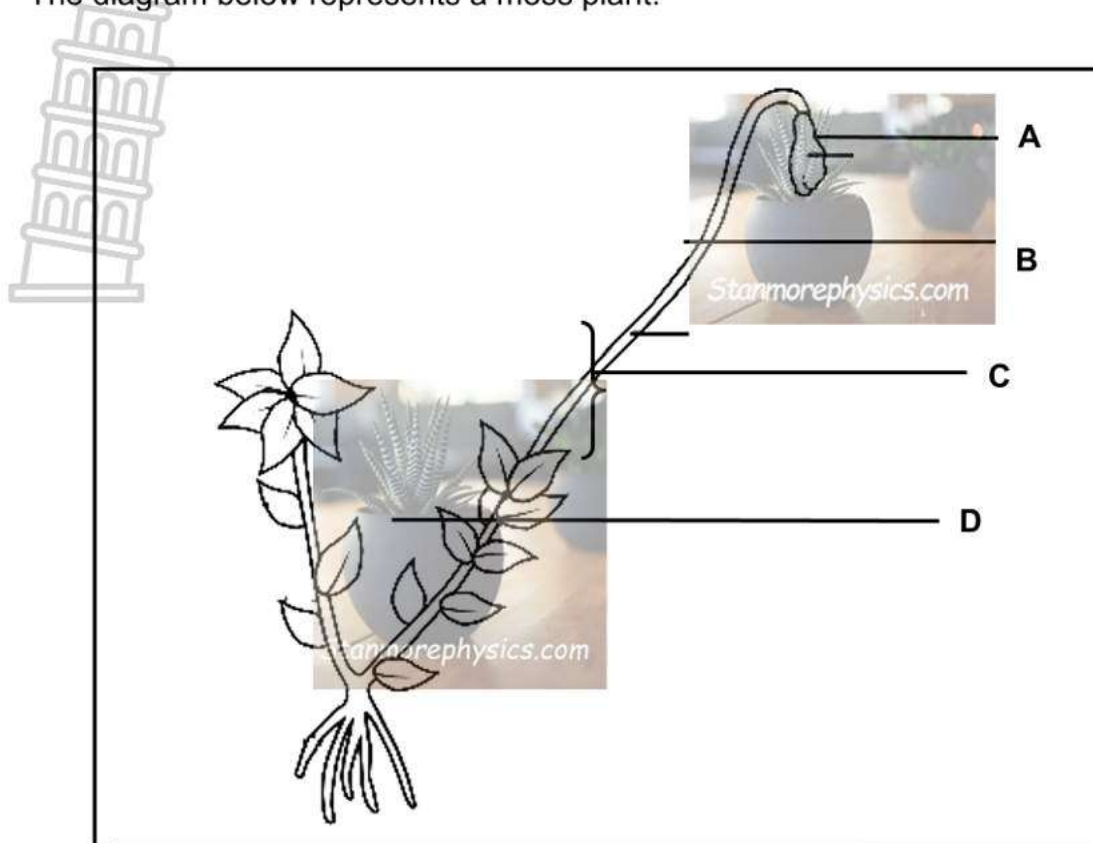
1.4.3 Name the phase of aerobic respiration that:

- (a) Occurs outside the organelle shown above. (1)
- (b) Releases energized hydrogen atoms and carbon dioxide. (1)

1.4.4 Give TWO end products of aerobic respiration in muscle cells. (2)

(11)

1.5 The diagram below represents a moss plant.



1.5.1 Identify part:

(a) **A** (1)

(b) **B** (1)

1.5.2 State the phylum to which the above plant belongs. (1)

1.5.3 Name the dominant generation in moss plant. (1)

1.5.4 Give the LETTERS that represent the alternation of generation mentioned in QUESTION 1.5.3. (2)

1.5.5 Name the part that absorb water and nutrients in moss plant. (1)

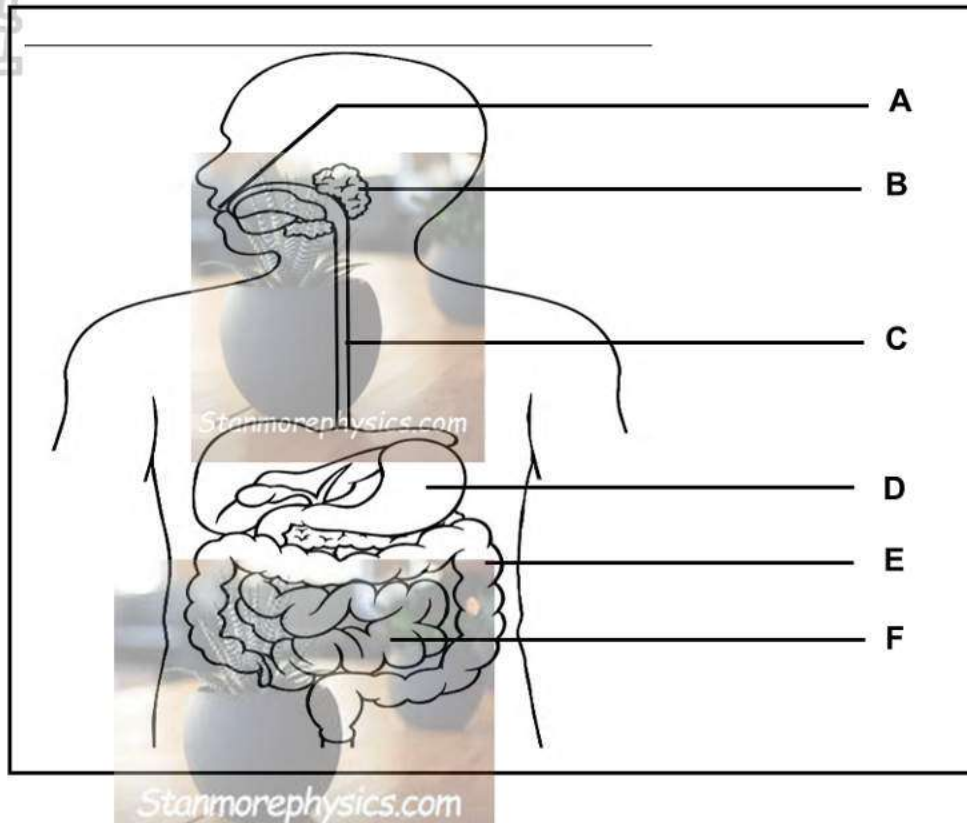
(7)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 The diagram below shows the human digestive system.



2.1.1 Give the LETTER and NAME of the part that:

- (a) Secretes enzyme amylase which help in the digestion of starch (2)
- (b) Absorbs water and any remaining absorbable nutrients (2)

2.1.2 Describe the structural suitability of part **C** during peristalsis. (2)

2.1.3 Gastroparesis is a condition that affect the muscles of Part **D** which results in food remaining in Part **D** for long period of time. (3)

Explain how this condition may lead to weight loss.

2.1.4 Describe the process of digestion in part **A** if a person eats cooked beef meat. (4)

(13)

2.2 Read the extract below.

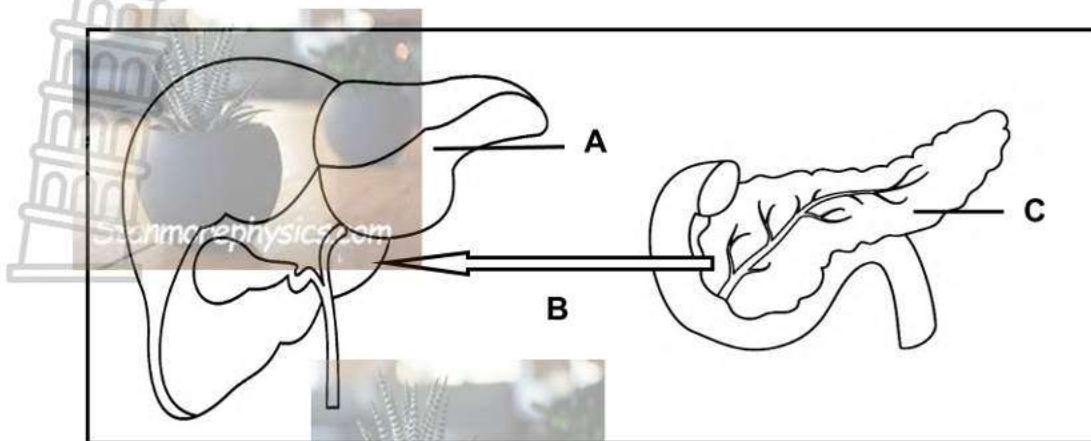
THE RELEVANCE OF PHOTOSYNTHESIS TO ALL LIVING THINGS

Photosynthesis is essential to all life on earth. It is the only biological process that can capture energy that originates in outer space (sunlight) and convert it into carbohydrates that every organism uses to power its metabolism.

The energy extracted today by the burning of coal and petroleum products represents sunlight energy captured and stored by photosynthesis almost 200 million years ago. The Earth has a concentration of carbon dioxide of approximately 0.04% in the atmosphere. However, studies on plant growth have found plants perform better in environments with 4% carbon dioxide.

- 2.2.1 Name the organelle in green plants that is responsible for the process above. (1)
- 2.2.2 Explain TWO ways in which the organelle mentioned in QUESTION 2.2.1 is structurally suitable for photosynthesis (4)
- 2.2.3 From the extract, state:
- (a) TWO sources of energy captured and stored by photosynthesis. (2)
 - (b) The organic compound that is formed during photosynthesis. (1)
- 2.2.4 According to the extract “...studies on plant growth have found plants perform better in environments with 4% carbon dioxide...”
- How many times greater is this concentration of carbon dioxide compared to earth’s atmosphere? Show ALL your workings. (2)
- (10)**

- 2.3 The diagram below represents parts of digestive system which regulates high glucose level in blood.



- 2.3.1 Identify each of the following:

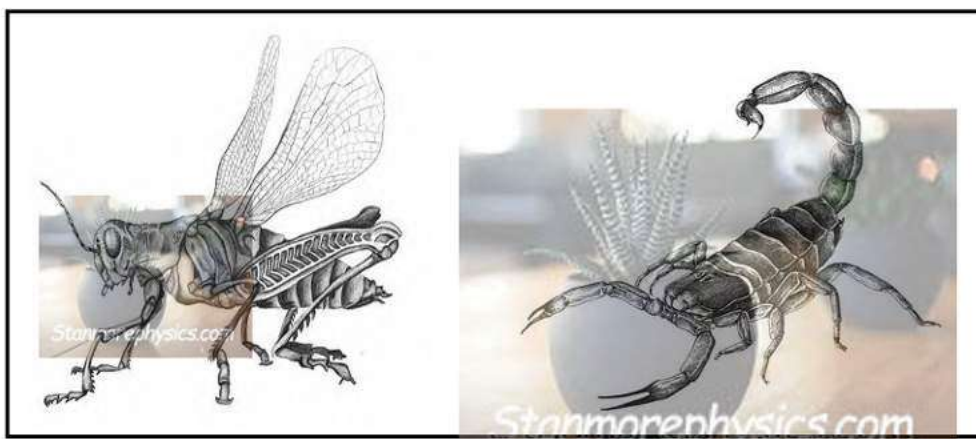
- (a) Organ **A** (1)
 (b) Gland **C** (1)
 (c) Hormone **B** (1)

- 2.3.2 Name the disorder which can be caused by the insufficient release of hormone **B**. (1)

- 2.3.3 State why Gland **C** is regarded as an endocrine gland. (3)

- 2.3.4 Give TWO functions of organ **A** in maintaining the glucose level in the blood. (2)
(9)

- 2.4 The diagram below shows organisms of phylum Arthropoda.



- 2.4.1 Identify the type of skeleton found in the organisms shown above. (1)

- 2.4.2 State TWO disadvantages of the type of skeleton mentioned in QUESTION 2.4.1. (2)

- 2.4.3 Explain TWO advantages of the fluid-filled cavity that develops in the mesoderm of the organisms in this phylum. (4)
(7)

- 2.5 An investigation was conducted to determine the effect of Bacillus Calmette-Guerin (BCG) vaccine on preventing both TB infection and disease.

The procedure was as follows:

- 20 healthy young people without TB were selected.
- Participants were divided into two groups, of ten people each.
- In **ONE** group, each person was injected with 0.1 ml of Bacillus Calmette-Guerin and the **OTHER** group, no injection of BCG was administered.
- Both groups were exposed to an area where TB was high and hygienic practices were absent, for two months.
- Their blood samples were tested at the end of each month using the (Interferon-Gamma Release Assay) IGRA, a technique used to detect TB infection.

The results were recorded in the table below.

	GROUP A		GROUP B	
Time of testing blood sample	First month	Second month	First month	Second month
Average level of TB bacterium in blood (cells/mcL)	34	121	0	0

- 2.5.1 Name the bacterium that causes TB. (1)

- 2.5.2 State TWO:

- (a) criteria that were used to select the participants for the investigation to ensure validity. (2)
- (b) ways in which the reliability of the investigation was ensured. (2)

- 2.5.3 Identify the group which was injected with BCG? (1)

- 2.5.4 Use the information in the table above to explain your answer to QUESTION 2.5.3. (3)

- 2.5.5 Antibiotics are prescribed medication for treatment of TB. However, the TB bacterium may become resistant to this medication.

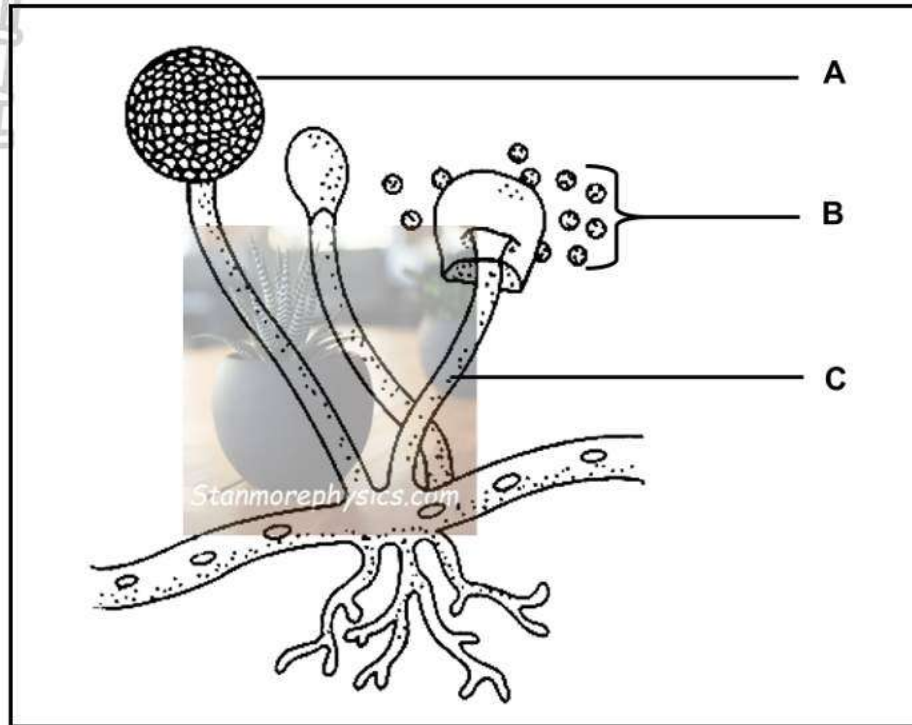
Explain why bacteria becomes resistant to antibiotics after a period of time. (2)

(11)

TOTAL QUESTION 2: 50

QUESTION 3

3.1 The diagram below shows a structure of a *Rhizopus* sp. and its life cycle.



3.1.1 Identify part:

(a) **A** (1)

(b) **C** (1)

3.1.2 Name the reproductive process which produces structures labelled **B** (1)

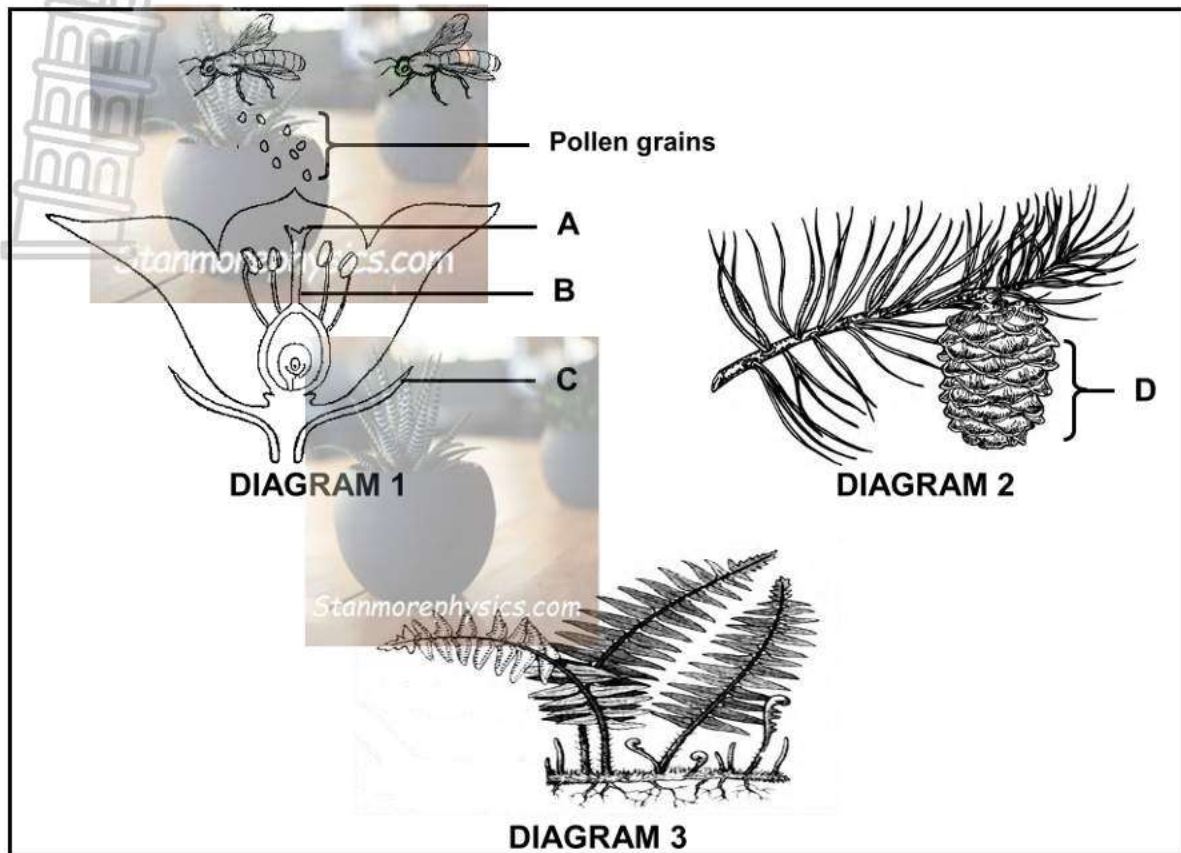
3.1.3 Describe the role of fungi in plant growth (2)

3.1.4 *Rhizopus* sp. is a heterotroph. Name the type of nutrition that occurs in the fungus above. Give a reason for your answer. (2)

3.1.5 Give ONE economic importance of fungi (1)

(8)

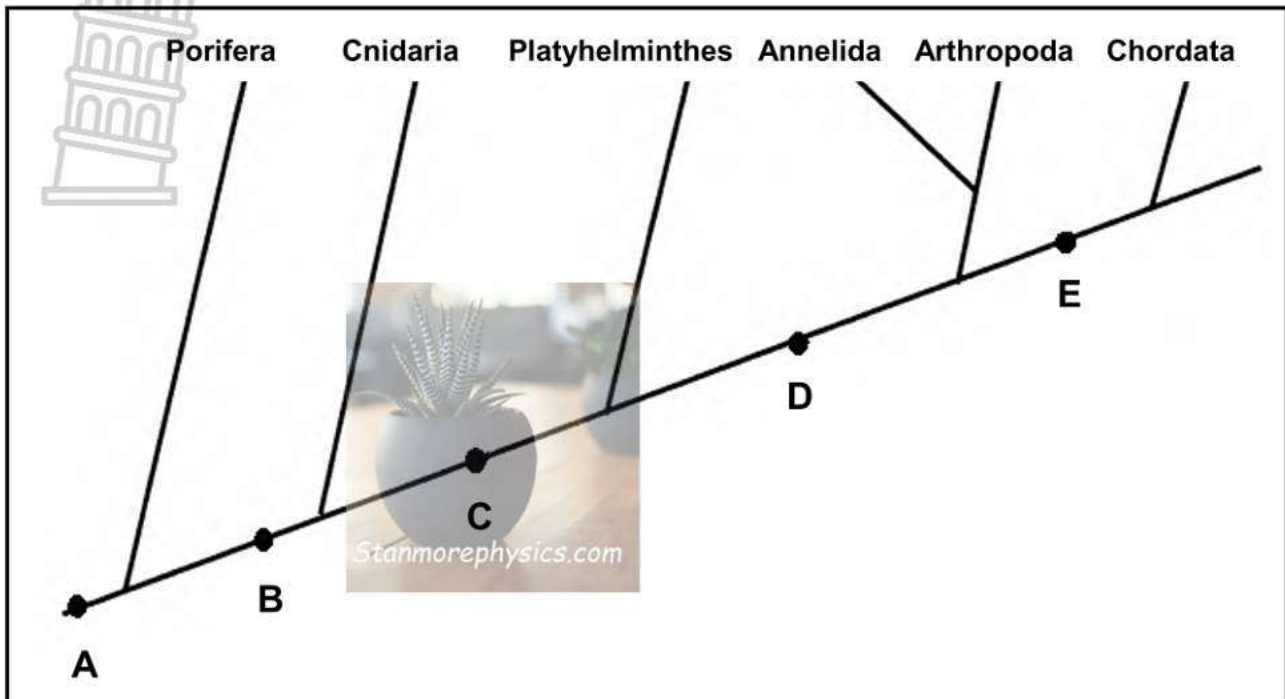
3.2 The diagrams below represent different plant groups.



- 3.2.1 Name the plant group that contains horizontal, underground stem. (1)
- 3.2.2 Using diagram NUMBERS (1, 2, 3) showing different plant groups, arrange the diagrams above in the sequence as they appear on earth. (2)
- 3.2.3 Explain TWO: (4)
- (a) ways on how part **A** is suitable for its function. (4)
 - (b) visible reasons why there is an increased chance of pollination in **DIAGRAM 1**. (4)
- 3.2.4 Describe how the plant group in **DIAGRAM 2** is able to reproduce effectively using reproductive structure **D**. (2)
- 3.2.5 Explain the importance of part **C** in the plant's energy production. (3)
- 3.2.6 Fern plants are larger than moss plants. Most of them are small shrubs 30 cm to 100 cm in height. However, some ferns are much taller trees. (3)
- Explain why fern plants grows taller than moss plants. (3)

(19)

- 3.3 The phylogenetic tree below shows a possible evolutionary relationship within animal diversity as represented from **A** to **E**.



- 3.3.1 Name the:

- (a) only phylum that remains attached to a substrate for most of its life. (1)
- (b) TWO phyla that are more closely related. (2)

- 3.3.2 Write down ONLY the LETTER that represents each of the following characteristics or description of animal diversity:

- (a) accumulation of sense organs in the anterior end. (1)
- (b) arrangement of body structures in relation to some axis of the body. (1)
- (c) presence of notochord. (1)

- 3.3.3 State TWO roles of organisms that displays characteristic **D** in the ecosystem and agriculture. (2)

(8)

- 3.4 *Nymphoides thunbergia* are green aquatic plants with submerged roots and floating leaves that hold the small flowers above the water surface.

Grade 11 learners conducted an investigation to determine the effect of carbon dioxide concentration on the rate of photosynthesis in *Nymphoides thunbergia* plant.

The procedure was as follows:

- *Nymphoides thunbergia* plant was placed upside down in a test tube containing natural water in a dark room.
- Sodium bicarbonate (NaHCO_3) was added in the water to give a constant saturated solution of carbon dioxide.
- The time taken for the release of bubbles was recorded. This is the rate of photosynthesis at that particular concentration of carbon dioxide.
- The procedure was repeated at different carbon dioxide concentrations by using different dilutions of saturated solution.

NOTE:

- Rate of a reaction decreases as time increases.

The results are recorded in the table below.

PROCEDURE	SODIUM BICARBONATE (NaHCO_3) CONCENTRATION (mol/L)	TIME TAKEN TO RELEASE BUBBLES (SECONDS)
1	0.6	160
2	1.2	140
3	2.4	80
4	3.1	60
5	3.5	40
6	3.7	40
7	4.0	40

- 3.4.1 Identify the independent variable. (1)
- 3.4.2 State why the experiment was placed in a dark room. (2)
- 3.4.3 Explain why the time taken to release bubbles remains constant after 3.5 mol/L concentration of NaHCO_3 . (4)
- 3.4.4 Write down the conclusion for this investigation. (2)
- 3.4.5 Plot a bar graph to represent the data in the table from procedure 1 to 4. (6)
- (15)**

TOTAL SECTION B: 100

GRAND TOTAL: 150



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GRADE 11

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LIFE SCIENCES

MARKING GUIDELINES

JUNE EXAMINATION

2025

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MARKS: 150

This question paper consists of 10 pages including this page.

PRINCIPLES RELATED TO MARKING LIFE SCIENCES JUNE 2025

1. **If more information than marks allocated is given**
Stop marking when maximum marks are 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 part of it is required**
Read all and credit relevant part.
4. **If comparisons are asked for and descriptions are given**
Accept if 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 unrecognized abbreviation but credit the rest of 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 recognizable accept provided it does not mean something else in Life Sciences or if it is out of context.

13. **If common names given in terminology**
Accept provided it was accepted at the National memo discussion meeting.
14. **If only letter is asked for and only name is given (and vice versa)**
No 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 appears 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 C ✓✓
 1.1.2 B ✓✓
 1.1.3 D ✓✓
 1.1.4 D ✓✓
 1.1.5 C / D ✓✓
 1.1.6 B ✓✓
 1.1.7 A ✓✓
 1.1.8 D ✓✓

(8 x 2) (16)

- 1.2 1.2.1 Hepatic portal vein ✓
 1.2.2 Blind gut ✓
 1.2.3 Villi ✓
 1.2.4 Epiglottis ✓
 1.2.5 Endoderm ✓
 1.2.6 Spermatophytes ✓
 1.2.7 Homeostasis ✓
 1.2.8 Phagocytosis (out of scope)
 1.2.9 Ovary ✓
 1.2.10 Oxygen debt (out of scope)

(8)

- 1.3 1.3.1 None ✓✓
 1.3.2 A only ✓✓
 1.3.3 B only ✓✓

(3 x 2) (6)

- 1.4 1.4.1 (a) Outer membrane ✓ (1)
 (b) Oxygen ✓ (1)
 (c) Pyruvic acid ✓ (1)

- 1.4.2 (a) C ✓ Matrix ✓ (2)
 (b) D ✓ Cristae ✓ (2)

- 1.4.3 (a) Glycolysis ✓ (1)
 (b) Krebs cycle ✓ (1)

- 1.4.4 - Carbon dioxide ✓
 - Water ✓
 - Energy/ATP ✓

(Mark first TWO only)

Any (2)
(11)

- 1.5 1.5.1 (a) Capsule ✓ (1)
- (b) **No answer**
- 1.5.2 Bryophyta / Bryophytes ✓ (1)
- 1.5.3 Gametophyte ✓ (1)
- 1.5.4 **No answer**
- 1.5.5 Rhizoid ✓ (1)



TOTAL SECTION A: 45

SECTION B

QUESTION 2

- 2.1 2.1.1 (a) B✓ Salivary gland✓ (2)
OR
 F✓ Small intestine✓
- (b) E✓ Large intestine✓ (2)
- 2.1.2 - contain (circular and longitudinal) muscles✓
 - that relaxes and contract✓
 - to push the food downwards✓ Any (2)
- 2.1.3 - movement of digested food from the stomach/part **D** to the small
 - intestine/ part **F** can be disrupted/delayed✓
 - small intestine cannot absorb nutrients✓ in time
 - this results in shortage of essential nutrients in body tissues✓
 - that are crucial for energy/fat production/storage of excess nutrients✓
(Mark first THREE only) Any (3)
- 2.1.4 - tongue pushes beef meal towards teeth✓
 - for chewing/mastication✓
 - large beef particles are broken down into small beef particles✓
 - by mechanical digestion✓ (4)
- (13)**

- 2.2 2.2.1 Chloroplast✓ (1)
- 2.2.2 - grana contain chlorophyll✓ to trap sunlight✓
 - has lamellae/thylakoids✓ that present a large surface area for absorption of sunlight✓
 - double membrane is (selectively) permeable✓ allowing water and carbon dioxide to enter easily✓
 - stroma contains enzymes/ribosomes✓ for photosynthesis ✓
 - Starch granule✓ for storage of starch✓
 (Mark first TWO only) Any (2 x 2) (4)
- 2.2.3 (a) - burning of coal✓
 - petroleum products✓
 (Mark first TWO only) Any (2)
- (b) carbohydrates✓ (1)
- 2.2.4 $\frac{4}{0.04} \} \checkmark = 100 \checkmark$ Stanmorephysics.com (2)
 (10)
- 2.3 2.3.1 (a) Liver✓ (1)
 (b) Pancreas✓ (1)
 (c) Insulin✓ (1)
- 2.3.2 diabetes mellitus✓ (1)
- 2.3.3 - do not have ducts✓
 - secretes hormones✓ / insulin and glucagon
 - directly into the blood✓ (3)
- 2.3.4 - it is stimulated to convert glycogen back into glucose✓
 - it is stimulated to convert excess glucose into glycogen✓ (2)
 (9)
- 2.4 2.4.1 Exoskeleton✓ (1)
- 2.4.2 - cannot stretch✓ / provides restriction on growth
 - during moulting animal can dry out ✓ / vulnerable to predators (2)
- 2.4.3 - provide space✓ for development of internal organs✓
 - separates gut wall from body wall✓ to function independently✓
 - reduces energy consumption for circulation✓ (2 x 2) (4)
 (7)

- 2.5 2.5.1 Mycobacterium tuberculosis ✓ (1)
- 2.5.2 (a) - participants were young ✓
- participants were healthy ✓ / without other diseases (2)
- (b) - investigation was conducted for 2 months ✓ (2)
- 10 people in each group ✓
- 2.5.3 **B** ✓ (1)
- 2.5.4 - after 2 months of exposure to areas where TB is high ✓
- **the average level of TB** in blood for group **B** was 0 ✓ in first month/the average level of TB in blood for Group A was 34
- in **second month, the average level of TB** in blood for group **B** **remained** at 0 ✓ / the average level of TB in blood for Group A **increased** to 121
- this show that BCG vaccine is effective in preventing TB infection ✓ Any (3)
- 2.5.5 - incomplete treatment courses/ stopping medication prematurely ✓
- allows the TB bacteria to survive and multiply ✓ resulting to drug resistance

- taking incorrect dosage of antibiotics ✓
- can allow the bacteria to survive ✓ and develop resistance

- using substandard antibiotics ✓ can result in ineffective treatment
- contributing to the development of resistance ✓
(Mark the first TWO only) Any (2)
(11)

TOTAL QUESTION 2 50

QUESTION 3

- 3.1 3.1.1 (a) Sporangium ✓ (1)
- (b) Sporangiphore ✓ (1)
- 3.1.2 Asexual reproduction ✓ (1)
- 3.1.3 - act as decomposers ✓
 - breaking down organic matter making nutrients accessible to plants ✓
 - form symbiotic relationship with plant roots increasing surface area for nutrient absorption ✓
(Mark the first TWO only) Any (2)
- 3.1.4 - saprophytic ✓
 - obtain nutrients from a decaying bread ✓ (2)
- 3.1.5 - Production of cheese ✓ /bread/beer/wine
(Mark the first ONE only) Any (1)
- (8)**
- 3.2 3.2.1 Pteridophytes ✓ (1)
- 3.2.2 3 – 2 – 1 ✓✓ (2)
- 3.2.3 (a) - sticky ✓ / contains hairs to trap pollen grain ✓
 - bilobed / large surface ✓ to receive pollen grain ✓ (4)
- (b) - pollen grain is in close proximity with the stigma ✓ to ensure that
 - the pollen grain land successfully into the stigma ✓
 - presence of pollinators/bees ✓ due to large visible petals
 - attracting the pollinating agents ✓/bees (4)
- 3.2.4 - Structure D provide protection ✓ for the ovules and developing naked seeds ✓
 - since the seed are not covered by a fruit ✓
(Mark the first TWO only) Any (2)
- 3.2.5 - sepal contains chloroplast ✓
 - responsible for photosynthesis ✓
 - which convert light energy into sugars/glucose ✓ (3)
- 3.2.6 - has conducting tissues/vascular system ✓ for efficient transport
 - of water and minerals to upper parts of the plant ✓
 - has supporting and strengthening tissue ✓
 - keeping the plant upright ✓ Any (3)
- (19)**

3.3 3.3.1 (a) Porifera ✓ (1)

(b) - Annelida ✓
- Arthropoda ✓ (2)

(Mark the first TWO only)

3.3.2 (a) C✓ (1)

(b) A✓ (1)

(c) E✓ (1)

3.3.3 - act as pollinators ✓
- play role in decomposition ✓ / aerating the soil (2)



(8)

3.4 3.4.1 carbon dioxide concentration ✓ (1)

3.4.2 No answer

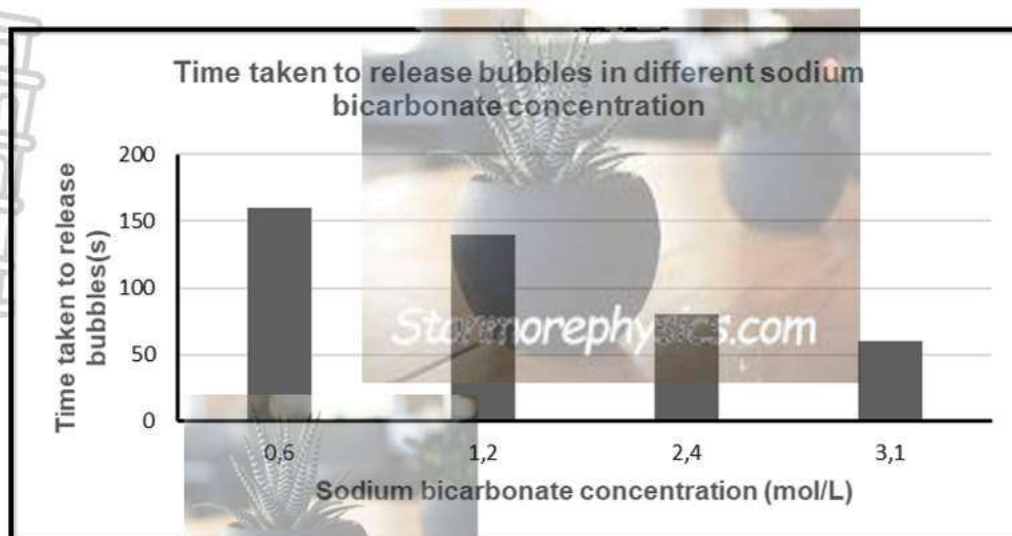
3.4.3 - sodium bicarbonate/ NaHCO_3 concentration is increasing ✓
- to release more/high carbon dioxide ✓
- the rate of photosynthesis remains at **40** ✓
- due to CO_2 toxic effects ✓ / denaturation of enzymes and other limiting factors ✓ Any (4)

3.4.4 - at low carbon dioxide concentration, the rate of photosynthesis is low ✓✓

OR

- increasing carbon dioxide concentration, increases the rate of photosynthesis ✓✓ Any (2)

3.4.5

**Criteria for marking the graph:**

Criteria	Elaboration	Mark
Correct type of graph (T)	Bar graph drawn	1
Caption of the graph (C)	Both variables included	1
Axes labels (L)	X and Y axis correctly labelled with units	1
Scale for X-axis (S)	- Equal space and width of bars for X-axis and - Correct scale for Y-axis	1
Plotting co-ordinates (P)	- 1 to 3 co-ordinates plotted correctly - All 4 required co-ordinates plotted correctly	1 2

(6)
(13)**TOTAL SECTION B: 98****GRAND TOTAL: 143****CONVERSION TABLE**

Mark obtained	Mark Added
138 - 143	+7
120 - 137	+6
102 - 119	+5
88 - 101	+4
76 - 87	+3
52 - 75	+2
37 - 51	+1
0 - 36	+0