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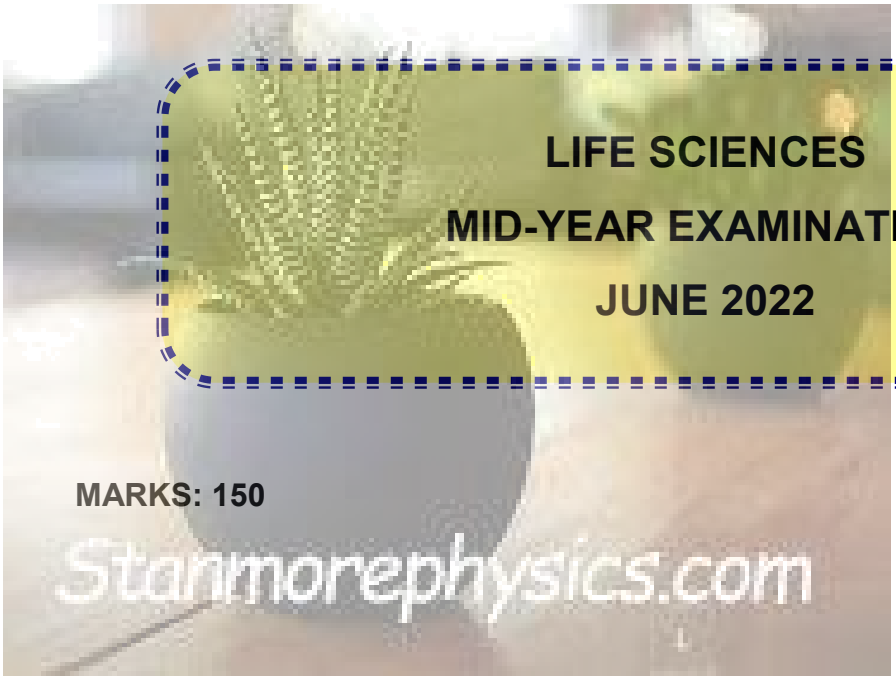


LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

GRADE 11

LIFE SCIENCES
MID-YEAR EXAMINATION
JUNE 2022



MARKS: 150

DURATION: 2½ HOURS

This QUESTION PAPER consists of 18 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, flow charts or tables 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 must use a non-programmable calculator, protractor and compass, where necessary.
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 to D) next to the question numbers (1.1.1 to 1.1.9) in the ANSWER BOOK, e.g. 1.1.10 D.

1.1.1 The use of antibiotics is an effective treatment for…

A viral infections.

B bacterial and protist infections.

C bacterial and viral infections.

D bacterial infections only.

1.1.2 All viruses are…

A eukaryotes.

B prokaryotes.

C unicellular and disease causing.

D capable of reproduction only in a host cell.

1.1.3 Bryophytes are adapted to living on land because they…

A contain vascular tissue.

B have rhizoids.

C can photosynthesize.

D produce gametes.



1.1.4 In Bryophytes, the gametophyte generation is the…

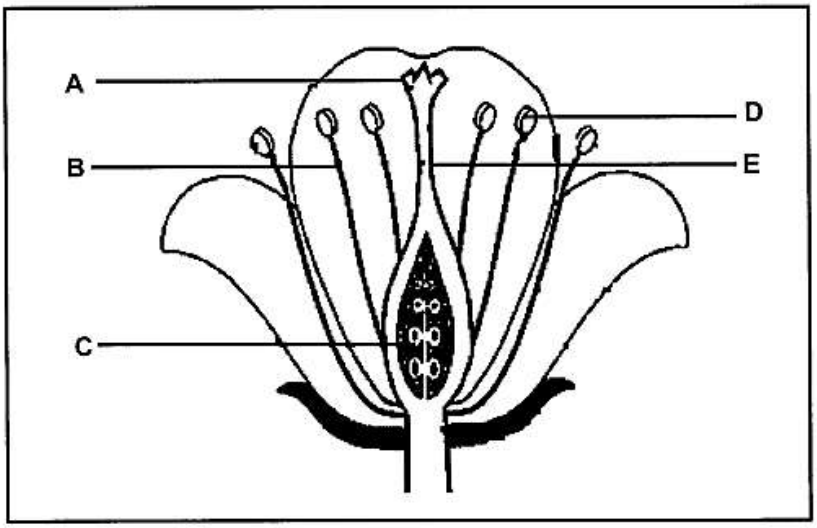
A adult plant.

B foot, seta and capsule.

C gametes.

D protonema.

1.1.5 The diagram below represents a flower



Which of the following combinations below represent the male sex organs of a flower?

A A and C

B D and E

C B and D

D A and E

1.1.6 The relationship between heterotrophic bacteria that feed on living organisms is called…

A predation.

B mutualism.

C commensalism.

D parasitism.

1.1.7 The characteristics listed below are all applicable to chloroplasts

(i) Contain a double membrane.

(ii) Contain a fluid matrix with enzymes.

(iii) Contain parallel sacs called lamellae.

(iv) Contain green pigment called chlorophyll.

(v) Contain starch granules.

Which combination of characteristics make the chloroplast suitable to perform its function?

A (i),(ii),(iv) and(v)

B (ii)(iii) and (iv)

C (ii),(iii),(iv) and (v)

D (i),(ii), (iii) and (v)



1.1.8 Which ONE of the following is a requirement in the dark phase of photosynthesis?

A Carbon dioxide

B Oxygen

C Radiant energy

D Water

1.1.9 Photosynthesis is a process that …

A converts radiant energy into chemical energy.

B converts chemical energy into heat energy.

C converts heat energy into chemical energy.

D converts radiant energy into heat energy.

(2 x 9) **(18)**

1.2 Give the correct biological term for each of the following descriptions. Write only the term next to the question numbers (1.2.1 to 1.2.8) in the ANSWER BOOK.

1.2.1 Organisms that cause diseases.

1.2.2 Life forms that are so small that they cannot be seen with the naked eyes.

1.2.3 The accumulation of sense organs at the front of the body that often leads to the development of a head.

1.2.4 Removal of solid waste from the body.

1.2.5 The splitting of water molecules into hydrogen and oxygen in the presence of light**.**

1.2.6 The site of reactions of the dark phase in the chloroplast.

1.2.7 The form in which excess glucose is stored in a plant.

1.2.8 A gas required for the process of aerobic respiration.

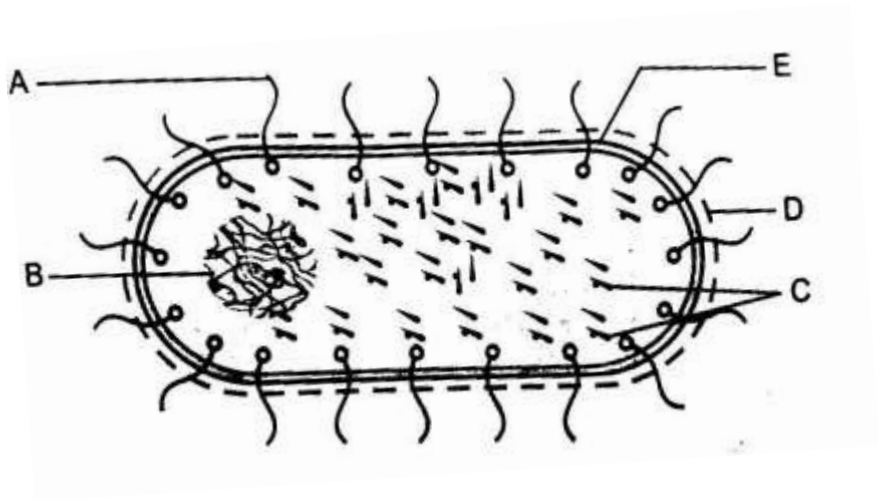
(8 x 1) **(8)**

1.3 Indicate whether each of the following statements in COLUMN I apply 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 Light is required	A: Respiration B: Photosynthesis
1.3.2 Generated from the sun	A: Radiant energy B: Chemical potential energy
1.3.3 Absorb water from the soil	A: Rhizoids B: Adventitious roots

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

1.4 The diagram below is that of a bacterial cell. Study it carefully and then answer the questions that follow.



1.4.1 Give the LETTER and the NAME of the part which:

(a) facilitates movement. (2)

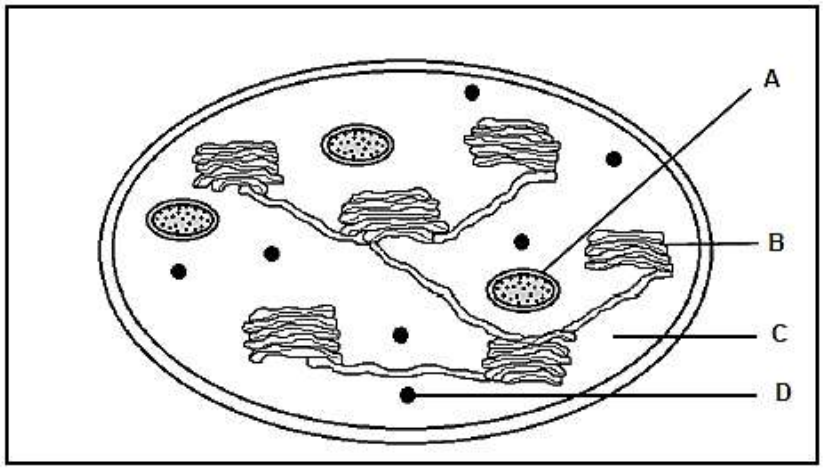
(b) contains all hereditary information. (2)

(c) protects the bacterium from harmful chemicals of the host. (2)

(d) produces proteins. (2)

(8)

1.5 The diagram below represents the structure of a chloroplast.



1.5.1 Identify

(a) Part **C** (1)

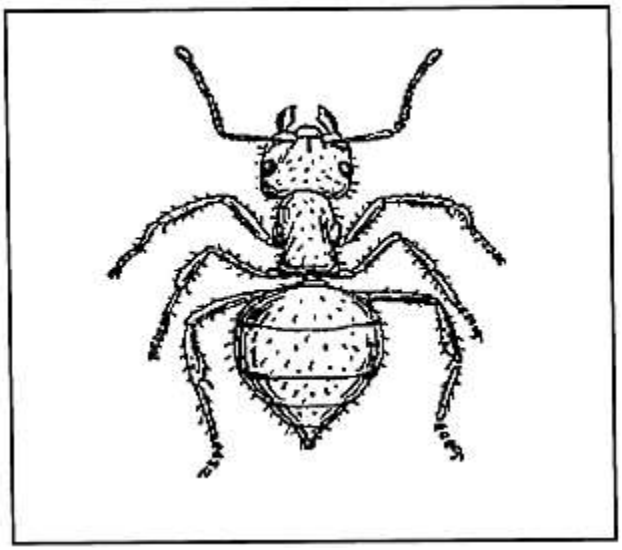
(b) Structure **D** (1)

1.5.2 Give the function of the part labelled **A** (1)

1.5.3 Name the part that will be active in light only (1)

(4)

1.6 Study the diagram below showing the arrangement of body tissues.



1.6.1 Identify the type of symmetry shown in the diagram above. (1)

1.6.2 Give ONE advantage of the symmetry mentioned in QUESTION 1.6.1. (2)

1.6.3 Name the internal fluid-filled space, which can arise in the mesoderm. (1)

1.6.4 Name TWO reasons why the part mentioned in 1.6.3 is biologically important. (2)

(6)

TOTAL QUESTION 1: [50]

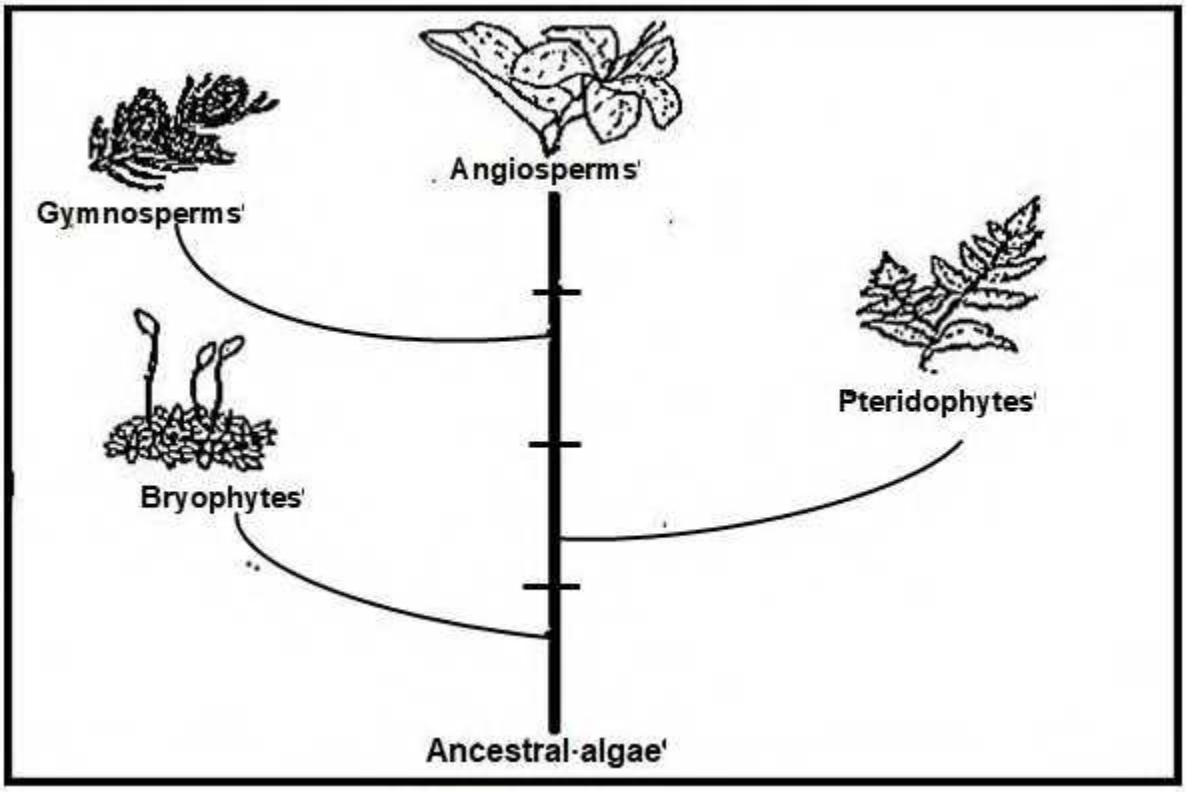
Stanmorephysics.com

TOTAL SECTION A: [50]

SECTION B

QUESTION 2

2.1 Study the diagram below representing plant diversity.



2.1.1 Which group of plants is represented as non-vascular in the diagram? (1)

2.1.2 Which group of plants were the last to evolve? (1)

2.1.3 Tabulate TWO differences between bryophytes and angiosperms. (5)

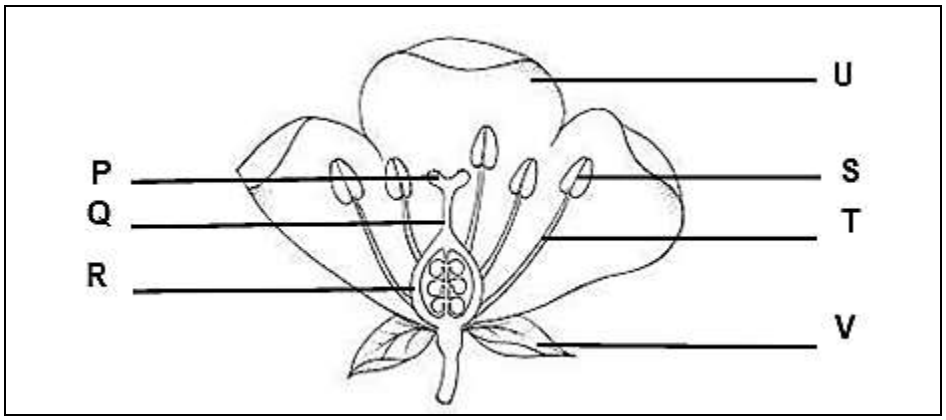
2.1.4 Mention the group of plants:

(a) which bear flowers. (1)

(b) which bear cones. (1)

(9)

2.2 Study the following diagram representing a flower



Give the NUMBER and the NAME of the part which:

(a) has a bright colour. (2)

(b) attracts insects for pollination. (2)

(c) produces pollen grains. (2)

(6)

2.3 A moss plant is able to reproduce sexually and asexually.

Mention :

(a) The part covering the sporangium, in which the spores will be formed. (1)

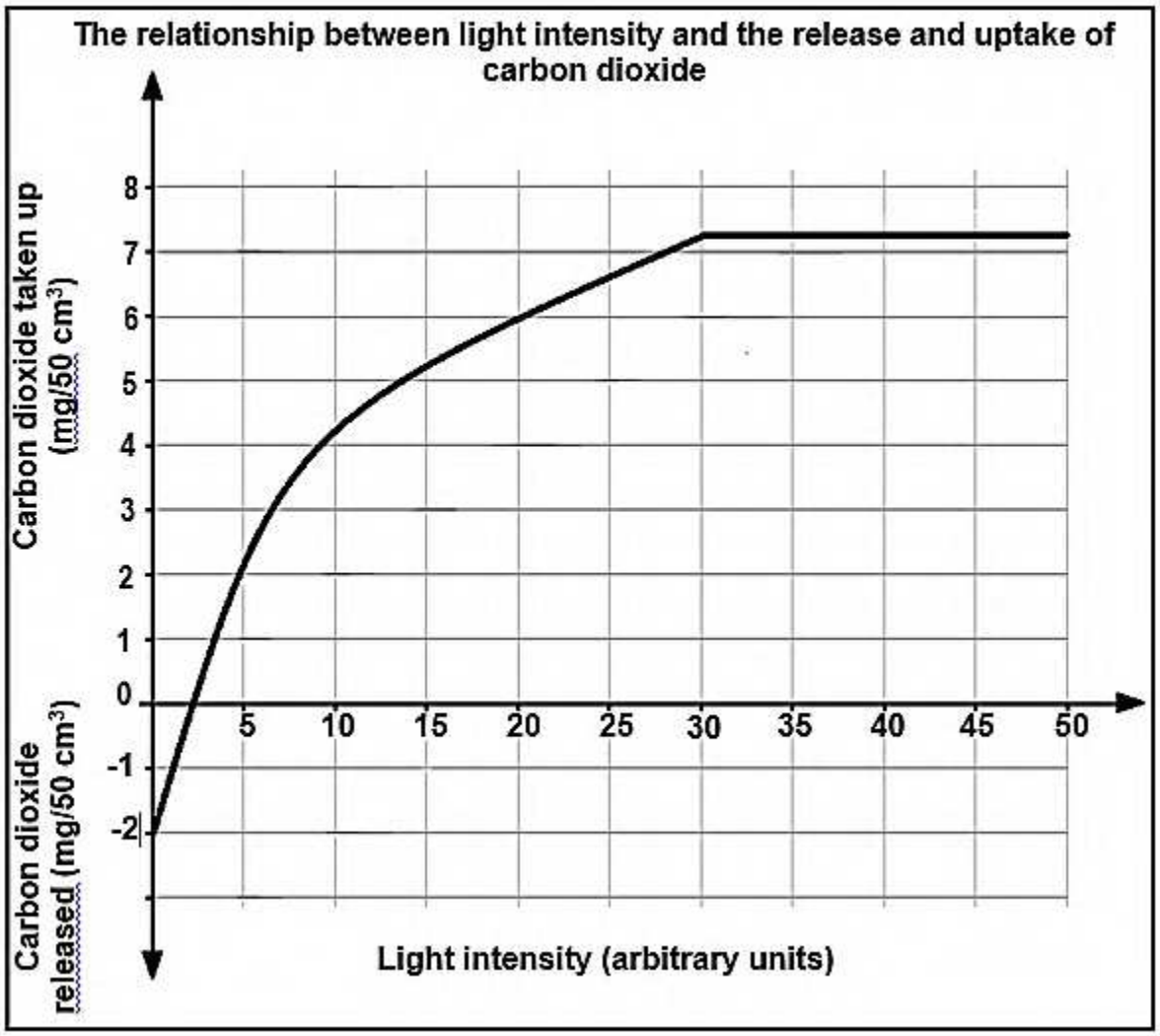
(b) The dominant generation in a moss plant. (1)

(c) A generation that produces spores. (1)

(3)



2.4 The graph below shows the relationship between light intensity and the release of carbon dioxide by the leaves of a plant



2.4.1 At what range of light intensity is carbon dioxide released? (2)

2.4.2 Name the process, taking place in the leaves, which uses carbon dioxide. (1)

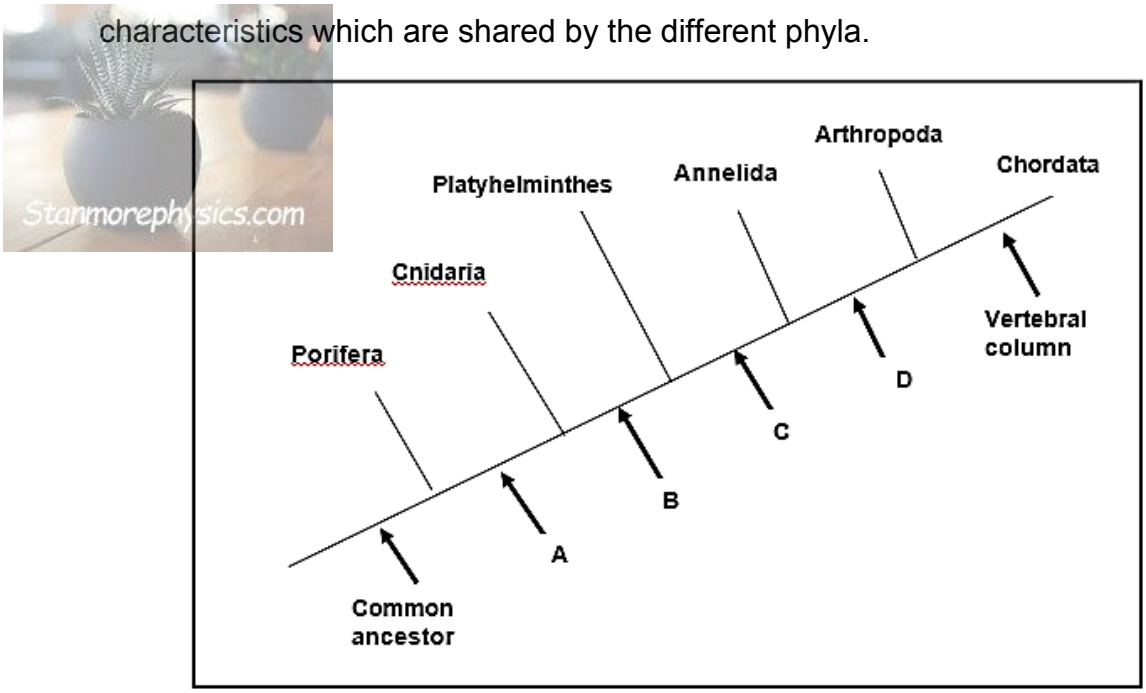
2.4.3 Name the cell organelle in which the process mentioned in 2.4.2 occurs (1)

2.4.4 Explain what happens when the light intensity is 30 arbitrary units, and the graph begins to flatten. (2)

2.4.5 How much carbon dioxide is taken up by leaves at a light intensity of 20 arbitrary units? (2)

(8)

2.5 The diagram below represents a cladogram (phylogenetic tree) showing the relationships among some animal phyla. The letters **A** to **D** indicate the characteristics which are shared by the different phyla.



2.5.1 Study the following characteristics

Bilateral symmetry		Coelom
Tissues	Asymmetry	Jointed appendages

Which characteristic appeared at the time represented by the following letters in the cladogram above.

(a) A (1)

(b) B (1)

(c) C (1)

(d) D (1)

2.5.2 From the diagram above state ONE characteristic that is not shared by the phyla Arthropoda and Chordata. (1)

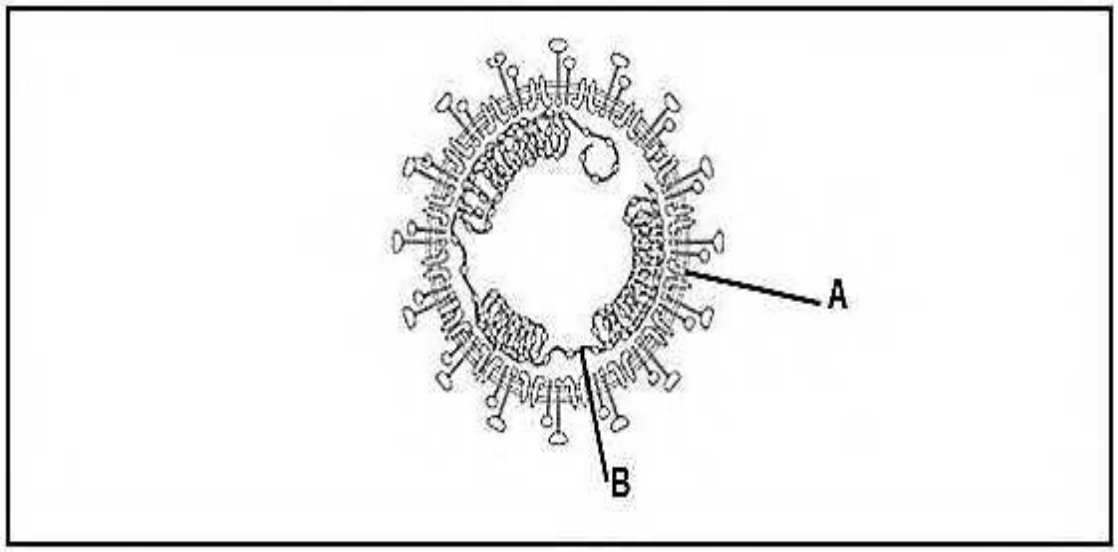
2.5.3 Draw a labelled diagram of the body wall of a cnidarian during its embryonic stage to show the tissue layers. (4)

2.5.4 Give TWO tissues that develops from the ectoderm. (2)

(11)

2.6 The novel corona virus, named COVID-19, escalated to a pandemic level during 2020. Scientists around the world raced to produce a vaccine to help fight the virus. However, it would take months before a vaccine could be released, once it had been discovered.

Below is the virus that caused our world to change.



2.6.1 Provide labels for viral parts **A** and **B** respectively (2)

2.6.2 Why were antibiotics not prescribed to fight against the virus? (2)

2.6.3 Explain how a vaccine works to protect us from a disease. (3)

2.6.4 Why would it take so long for a vaccine to be released? (2)

(9)

2.7 Malaria causes over 400 000 deaths each year globally.

2.7.1 Name the protist that causes malaria. (1)

2.7.2 What is the vector that spreads malaria? (1)

2.7.3 Give TWO common symptoms in malaria patients (2)

(4)

TOTAL QUESTION 2: 50

QUESTION 3

3.1 Read the following extract.

> Insulin is a hormone that allows cells to absorb and use glucose. It regulates the amount of glucose that circulates in the blood stream. It also instructs the liver to store excess glucose.
>
> In people with insulin resistance, the cells are unable to use insulin effectively. When the cells cannot absorb glucose, levels of glucose build up in the blood. Therefore, the pancreas makes extra insulin to overcome the low rate of glucose absorption and diabetes is less likely to develop. This means that the blood glucose levels will stay within the healthy range. Over time, the pancreas's ability to release insulin begins to decrease which leads to the development of type 2 diabetes.

3.1.1 Name the gland that secretes insulin. (1)

3.1.2 Why is glucose required in the cells? (1)

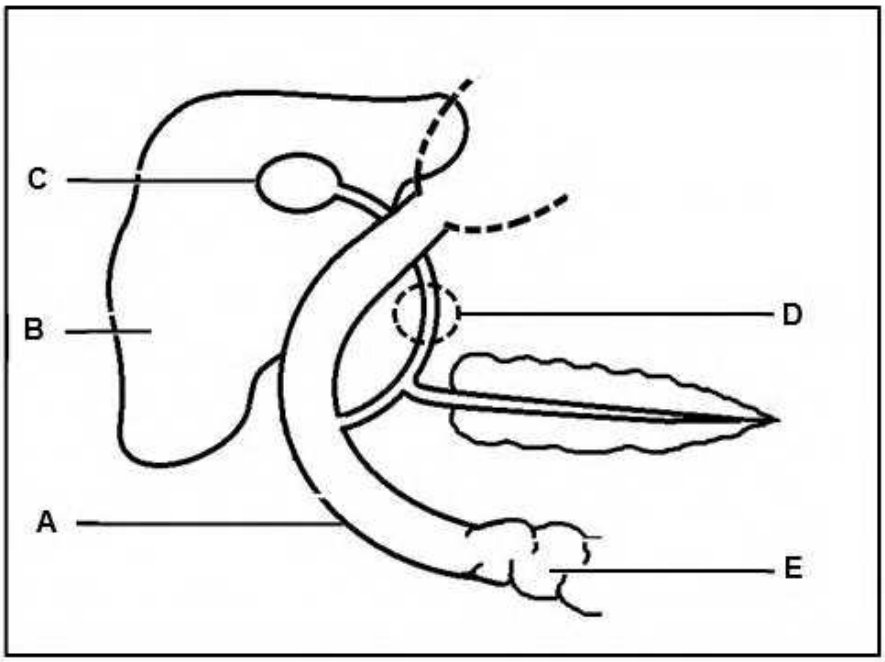
3.1.3 Describe how insulin resistance leads to type 2 diabetes (5)

3.1.4 Explain how normal glucose levels are maintained when a healthy non-diabetic person consumes food containing a high percentage of glucose (6)



(13)

3.2 The diagram below represents a certain section in the human alimentary canal.(digestive canal):



3.2.1 Identify parts:

(a) **A** (1)

(b) **C** (1)

3.2.2 State THREE functions of the part labelled **B** (3)

3.2.3 Explain how fat digestion would be affected if the duct labelled **D** were blocked. (3)

3.2.4 Explain FOUR ways in which the part labelled **E** is structurally suited for the efficient absorption of digested nutrients. (4)

3.2.5 Give the LETTER and the NAME of part which:

(a) stores bile. (2)

(b) carries secretions into the duodenum. (2)

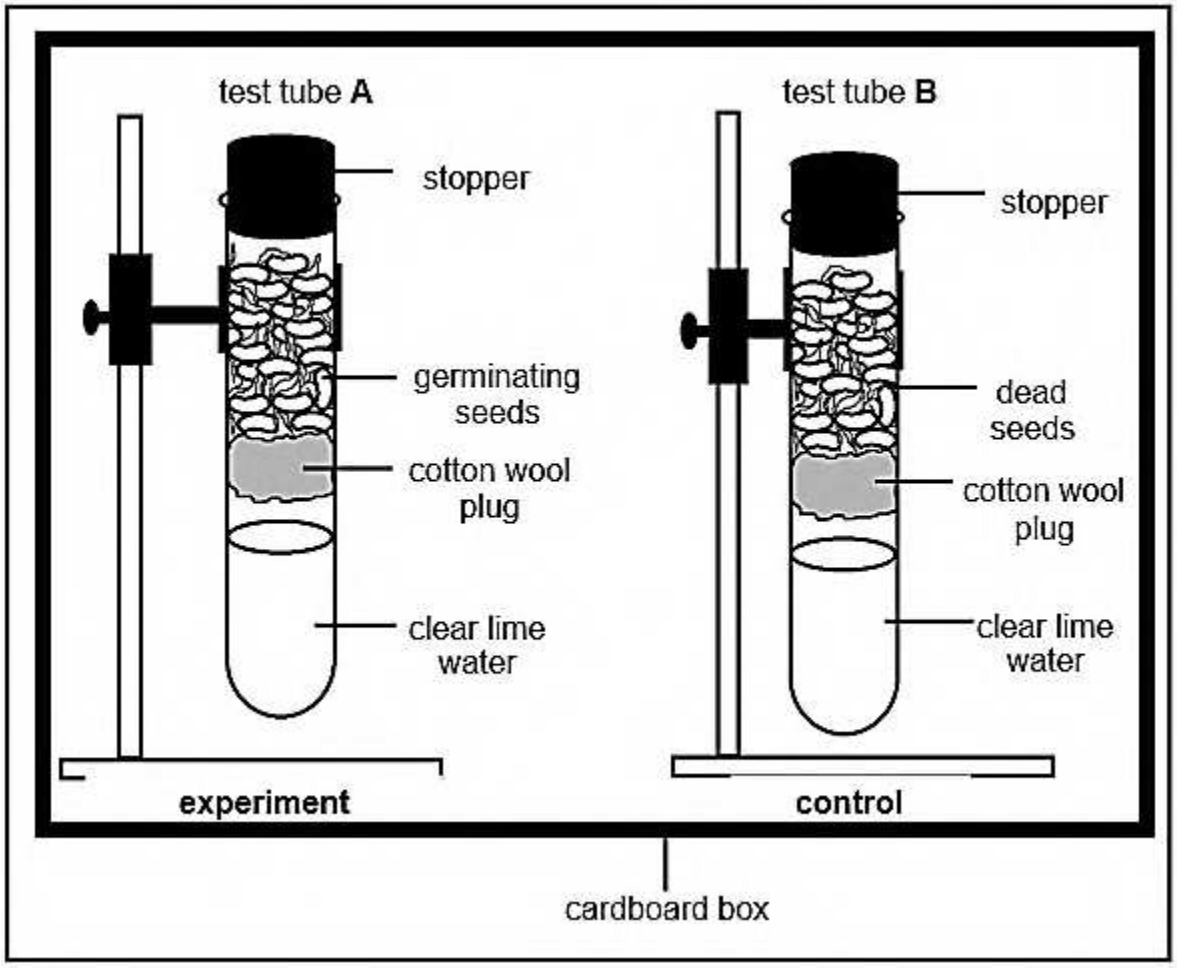
(c) receives food from the stomach. (2)

(18)

3.3 An investigation was conducted to determine which gas was released during cellular respiration.

The procedure was as follows:

- 120 seeds of the same species were germinated
- 60 of them were separated and placed in boiling water for 30 minutes
- The other germinating seeds were placed in test tube **A** while seeds from the hot water were placed in test tube **B** after cooling
- Both sets of apparatus were rinsed with formalin to remove any micro-organisms which might have been present
- Both sets of apparatus were set as shown in the diagram below





3.3.1 Write a hypothesis for the investigation. (2)

3.3.2 Name the gas released during cellular respiration. (1)

3.3.3 How was the test for the gas mentioned in QUESTION 3.3.2, carried out? (1)

3.3.4 Why was germinating seeds used in the experiment? (2)

3.3.5 Explain why the result was different in the control part as compared to the experiment. (2)

3.3.6 Why was a cotton wool plug used as a barrier instead of using a rubber block. (2)

3.3.7 The size of the seeds and the rate of metabolism in the seeds vary and, therefore, the result obtained in this experiment may not be reliable.

How would you improve the reliability of this experiment? (1)

3.3.8 GIVE a reason for keeping both sets of apparatus in a cardboard box. (1)

3.3.9 Which TWO environmental factors must be kept constant during this experiment? (2)

(14)

3.4 In cellular respiration glucose is broken down in a step- wise process to energy as ATP.

3.4.1 Give ONE major difference between aerobic respiration and anaerobic respiration. (2)

3.4.2 Mention THREE stages of anaerobic respiration. (3)

(5)

TOTAL QUESTION 3: [50]

TOTAL SECTION B: [100]

GRAND TOTAL: 150



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION



GRADE 11

LIFE SCIENCES

CONTROLLED TEST 1

MID YEAR EXAM 2022

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 10 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 loss marks for not tabulating.
6. **If diagrams are given with annotations when descriptions are required**.
   Candidates will lose marks
7. **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.
8. **If flow charts are given instead of descriptions.**
   Candidates will lose marks
9. **Non-recognised abbreviations.**
   Accept if first defined in answer. If not defined, do not credit the unrecognized 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. **If common names are given in terminology**
    Accept, provided it was accepted at the national memo discussion meeting.
13. **Spelling errors**
    If recognizable, accept the answer, provided it does not mean something else in Life Sciences or if it is out of context.
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. Marking guideline 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**
    An illustrations (diagrams, graphs, tables, etc.) must have 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 learner's 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 applicable to all official languages.

SECTION A

QUESTION 1

1.1 1.1.1 D √√
1.1.2 D √√
1.1.3 B √√
1.1.4 A √√
1.1.5 C √√
1.1.6 D √√
1.1.7 C √√
1.1.8 A √√
1.1.9 A √√ (9 X 2) **(18)**

1.2 1.2.1 Pathogens √
1.2.2 Micro organisms √
1.2.3 Cephalisation√
1.2.4 Egestion √
1.2.5 Photolysis √
1.2.6 Stroma √
1.2.7 Starch √
1.2.8 Oxygen √ (8 X 1) **(8)**

1.3 1.3.1 B only √√

1.3.2 A only √√

1.3.3 Both A and B √√ (3 X 2) **(6)**

1.4. 1.4.1 (a) A√ - Flagellum √ (2)

(b) B√ - Chromatin material (DNA) √ (2)

(c) D √ - Capsule / slime sheath √ (2)

(d) Ribosomes √ (2)

(8)

1.5 1.5.1 (a) Stroma √ (1)

(b) Ribosome √ (1)

1.5.2 It stores the starch √ (1)

1.5.3 Granum/Grana/ Thylakoid / Lamella√ (1)

(4)

1.6 1.6.1 Bilateral √ (1)

1.6.2 -Allows for cephalization √

- making detection of prey and danger much easier √ (2)

1.6.3 Coelom √ (1)

1.6.4 - The coelom separates the body wall from the gut wall √

- allowing the muscles of the body wall to function independently of then gut wall √

- Coelom provides a hydrostatic skeleton √

- against which the muscles can work √

- The coelom provides a space

- to accommodate the various organs in the body/ to allow growth of the organs √

- the coelomic fluid √

- acts as a shock absorber/ keeps the skin moist for gas exchange √

(Any 1x2) (2)

(Mark first ONE only)

(6)

TOTAL SECTION A: 50



QUESTION 2

2.1 2.1.1 Bryophytes √ (1)

2.1.2 Angiosperms √ (1)

2.1.3

BRYOPHYTES	ANGIOSPERMS
No vascular tissues present/no xylem and phloem present √	Vascular tissues present/has xylem and phloem √
Does not produce seeds √	Produces seeds √
Dependent on water for fertilization √	Not dependent on water for fertilization √

(2 x 2 + 1 for table) (5)

2.1.4 (a) Angiosperms √ (1)

(b) Gymnosperms √ (1)

(9)

2.2 (a) U√ - Petal/Corolla √ (2)

(b) U√ - Petal/ Corolla √ (2)

(c) S√ - Anther √ (2)

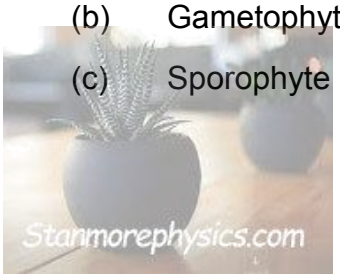
(6)

2.3 (a) Caliptra √ (1)

(b) Gametophyte generation √ (1)

(c) Sporophyte generation √ (1)

(3)



2.4 2.4.1 Between 0- 2 √ arbitrary units √ (2)

2.4.2 Photosynthesis √ (1)

2.4.3 Chloroplast √ (1)

2.4.4 This point the light intensity is to high√

The stomata will close√

The carbon dioxide becomes the limiting factor √ any (2)

2.4.5 6 mg √ / 50cm^2 √ (2)

(8)

2.5 2.5.1 (a) Tissues √ (1)

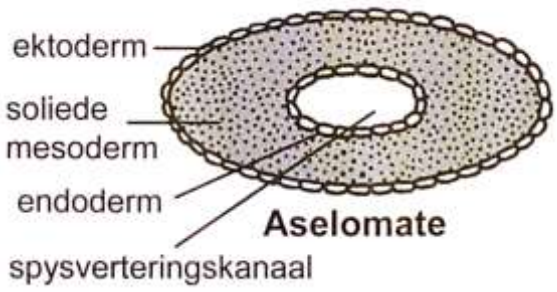
(b) Bilateral symmetry √ (1)

(c) Coelom √ (1)

(d) Jointed appendages √ (1)

2.5.2 Presence of vertebral column √ (1)

2.5.3 -



Criteria	Marks
Caption	1
Any 3 correct labels	3

2.5.4 Outside protective layer√

Nervous system√

Sense organs √ any (2)

2.6 2.6.1 A- Protein coat √

B- RNA √ (2)

2.6.2 Antibiotics are used to kill living organisms / bacteria √

Viruses are not living √ (2)

2.6.3 A person is given a weak strain of the germ √

the body will produce antibodies to fight the infection √

The body will store the antibodies.

The antibodies will protect them against a new/ stronger infection

of then same germ √

The body will react much faster√ as it already knows the structure of the pathogen – so it will not have any time to reproduce and make you sick √

any (3)

2.6.4 The vaccine would need to go through trial √

to ensure it has no negative effects √ (2)

(9)

2.7 2.7.1 Plasmodium √ (1)

2.7.2 Mosquito/ anopheles √ (1)

2.7.3 headaches √

Fever √

Sweating√

Chills √ Muscular pain√

Diarrhea √ Nausea and vomiting √

Loss of appetite √ Convulsions √

Cough √

(Mark first TWO only) (Any 2) (2)

(4)

[50]

QUESTION 3

3.1 3.1.1 Pancreas √ / Islets on Langerhans (1)

3.1.2 The glucose is a source of energy √ as it is oxidized (broken down) during respiration (1)

3.1.3

- When a person develops insulin resistance,
- the body cells become incapable of using insulin effectively √ unable to absorb sufficient amounts of glucose√
- This leads to an increase in the level of glucose in the blood √
- which stimulates the pancreas to secrete extra insulin √
- to enable the cells to absorb sufficient amounts of glucose √
- Over a period of time, the ;pancreas's ability to secrete extra insulin begins to decrease √
- which leads to the development of type 2 diabetes √

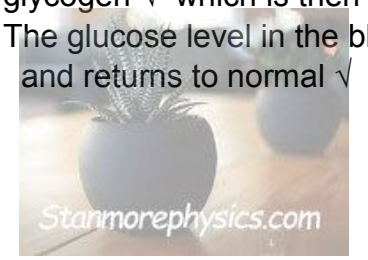
(Any 5) (5)

3.1.4

- Glucose level in the blood increases√ above the normal levels √
- The pancreas is stimulated √
- To secrete insulin into the blood √
- Insulin travels in the blood to the liver √
- Where it stimulates the conversion of excess glucose to glycogen √ which is then stored √
- The glucose level in the blood now decreases√ and returns to normal √

(Any 6) (6)

(13)



3.2 3.2.1 (a) A- Duodenum / Small intestine√ (1)

(b) C- gall bladder√ (1)

3.2.2

- secretes bile √
- is able to √
- stores minerals such as iron √
- Stores vitamins such as A, D and B_{12} √
- Deamination of excess amino acids takes place in the liver √
- Able to detoxify certain harmful substances and make them Harmless √ (**Mark first THREE only**) (Any 3) (3)

3.2.3

- The bile will not be released into the duodenum √
- therefore, no emulsification of fat is possible√ / not broken down into tiny droplets
- This means that the enzyme lipase cannot digest fats into fatty acids and glycerol √ / lipase action is less effective. (3)

3.2.4

- Very long intestine √ /Part **E** ensures that the food remains in the alimentary canal for a long time for maximum absorption √
- The millions of villi in the small intestine/Part **E** increase the surface area for absorption √
- The walls of the villi are made up of a single row of columnar epithelial cells√ (thin walls) for easy absorption of digested nutrients √
- The lacteal and capillaries √ transport the absorbed food away quickly √
- The columnar epithelial cells of the villi have microvilli to increase the surface area for absorption
- The columnar epithelial cells √ have a high concentration of mitochondria√ to provide energy√ for active absorption of food (Any 4) (4)

3.3.5 (a) C√ - gall bladder √ (2)

(b) D√ - bile duct √ (2)

(c) A √ - duodenum

(18)

3.3 3.3.1 Carbon dioxide / oxygen is released during cellular respiration√√ (2)

3.3.2 Carbon dioxide √ (1)

3.3.3 The clear lime water turns milky white in the presence of carbon dioxide √ (1)

3.3.4 - Germinating seeds are actively growing plant parts √

- therefore, the rate of respiration is higher √ than in any other parts of the plant
- since more energy √ is required for the active growth process (Any 2) (2)

3.3.5 - No cellular respiration takes [place in the dead seeds √

- as a result, no carbon dioxide is released √ therefore, clear lime water remains clear √ (Any 2) (2)

3.3.6 - There are spaces between the fibers of the cotton plug √/ gases can diffuse through cotton wool

- allows the downward movement of carbon dioxide √

OR

- The rubber block does not allow the downward movement of carbon dioxide √
- hence no result would be obtained√ . (2)

3.3.7 - Repeat the experiment several times √

- use more seeds √ / increase sample size (Any 1) (1)

3.3.8 - Some of the cells in the seeds may contain chloroplasts √ and therefore

- they perform photosynthesis √
- and disrupt the end result √ (Any 1) (1)



3.3.9 - Temperature √

- Light √ (2)

(14)

3.4 3.4.1 - Aerobic respiration occurs in the presence of oxygen √ (1)

- Anaerobic respiration occurs in the absence of oxygen√ (1)

3.4.2 - Glycolysis √

- Krebs cycle √
- Oxidative phosphorylation √ (3) **(5)**

[50]

TOTAL SECTION B: 100

GRAND TOTAL: 150