Hoërskool Johan Jurgens
Life Science
Grade 11
November Final Examination
Paper 1

Examiner: Ms. M. Botha | **Time: 2 Hours and 30 Minutes**

Moderator: Ms. S. Stoltz | **Total: 150 Marks**

Date: November 2025 | **Internal Paper**

Instructions and Information

Read the following instructions carefully before answering the questions.

1. Answer ALL the questions.
2. Write ALL the answers on the folio paper provided.
3. Start EACH QUESTION on 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. Draw all drawings in pencil and labels in blue or black ink.
7. Draw diagrams or flow charts only when asked to do so.
8. The diagrams in this question paper are NOT necessarily drawn to scale.
9. You may use a non-programmable calculator, protractor and compass where necessary.
10. Write neatly and legibly.

This question paper consists of 14 pages

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 question number (1.1.1 to 1.1.10), for example **1.1.11 D**.

1.1.1 Photosynthesis is a process that:

A convert's 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)

1.1.2 If all the green plants in the world were destroyed, the atmospheric gas that would increase be:

A Oxygen
B Nitrogen
C Hydrogen
D Carbon dioxide (2)

1.1.3 The digestion of carbohydrates, proteins and fats are known as:

A condensation
B oxidation
C fermentation
D hydrolysis (2)

1.1.4 Which one of the following components of a diet **DOES NOT** provide energy?

A Fats
B Vitamins
C Sugar
D Starch (2)

1.1.5 Which **ONE** of the following substances is formed during anaerobic respiration by yeast cells?

A Ethyl alcohol (Ethanol)
B Oxygen
C Glucose
D Carbonic acid (2)

1.1.6 During anaerobic respiration in animals, the pyruvic acid is converted to:

A ethyl alcohol
B lactic acid
C hydrochloric acid
D acetic acid (2)

1.1.7 The wall of an alveolus is made up of:

A ciliated columnar epithelium
B cuboidal epithelium
C squamous epithelium
D columnar epithelium (2)

1.1.8 The function of the cilia in the breathing system is to:

A increase the production of mucus
B removes mucus and dust particles from the air passages
C trap dust particles
D remove dust particles from the pharynx (2)

1.1.9 The best description of excretion is the removal of:

A excess salts
B metabolic waste
C excess water
D undigested food (2)

1.1.10 There is no glucose in the urine of a healthy person, but the amount of glucose in the renal artery is less than the amount of glucose in the renal vein due to the glucose being:

A used by the kidney during respiration
B converted into glycogen and stored in Bowman's capsule
C reabsorbed by the renal vein
D converted to urea in the cuboidal epithelial cells (2)

[20]

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 Structures in the leaf through which gas exchange takes place. (1)

1.2.2 The pigment in the chloroplast that traps radiant energy. (1)

1.2.3 A condition that results in the body receiving either too much or too little food. (1)

1.2.4 A nutritional disease caused by a psychological condition where a person refuses to eat although food is available. (1)

1.2.5 Allergic reaction to dust and pollen in the air. (1)

1.2.6 Molecules that give blood their red colour. (1)

1.2.7 The tube that carries urine from the kidney to the bladder. (1)

1.2.8 The tube that carries urine from the bladder to the outside of the body. (1)

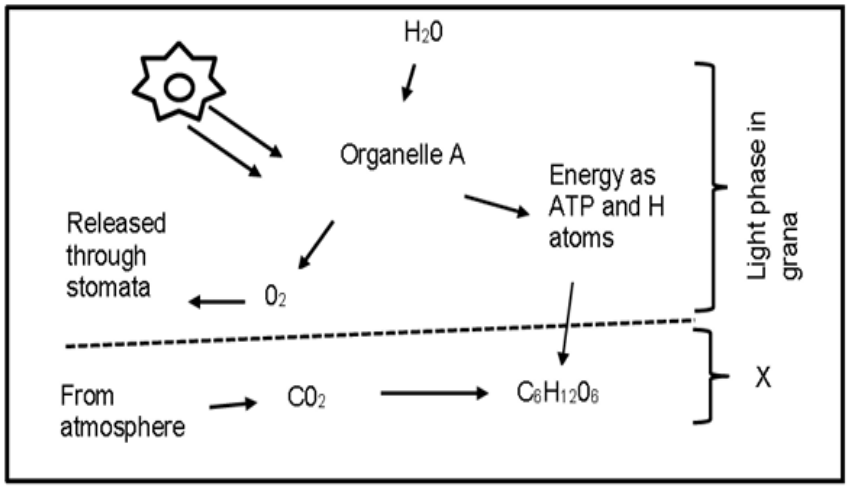
[8]

1.3 Indicate whether each of the descriptions in COLUMN A applies to A ONLY, B ONLY, BOTH A and B or NONE of the items in COLUMN B. Write **A only**, **B only**, **Both A and B** or **None** next to the question number.

	COLUMN A	COLUMN B	
1.3.1	Site of cellular respiration.	A. Chloroplast B. Mitochondrion	(2)
1.3.2	The phase of cellular respiration during which carbon dioxide is released.	A. Glycolysis B. Krebs cycle	(2)
1.3.3	Respiration is the chemical process where glucose is broken down in the …….. of oxygen.	A. presence B. absence	(2)

[6]

1.4 The diagram below is a schematic representation of the process of photosynthesis.



1.4.1 Identify organelle **A**. (1)

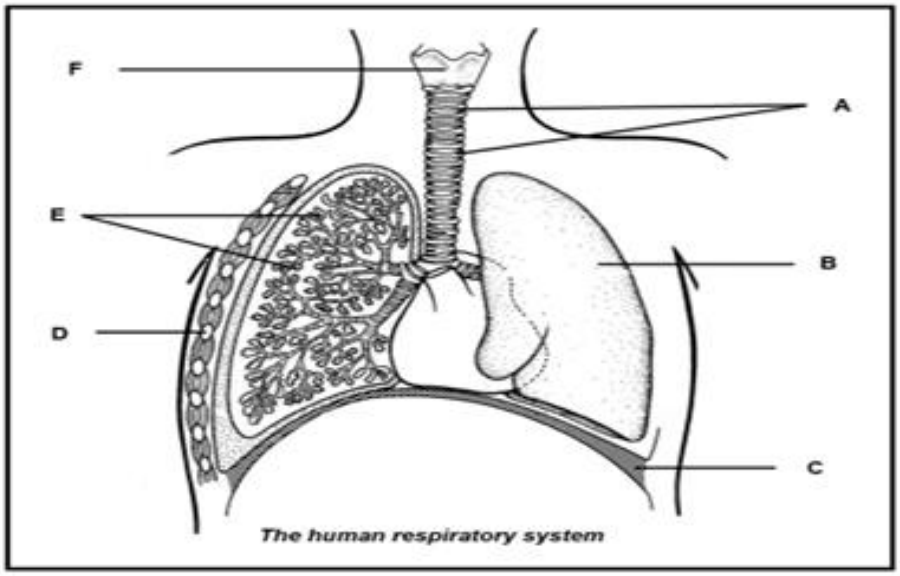
1.4.2 Name the following:

(a) the phase represented by **X**. (1)
(b) the part of the organelle **A** in which the phase in **QUESTION 1.4.2 (a)** takes place. (1)

1.4.3 Explain **TWO** effects on living organisms if photosynthesis does not occur. (4)

[7]

1.5 Study the diagram below and answer the questions that follow:



The human respiratory system

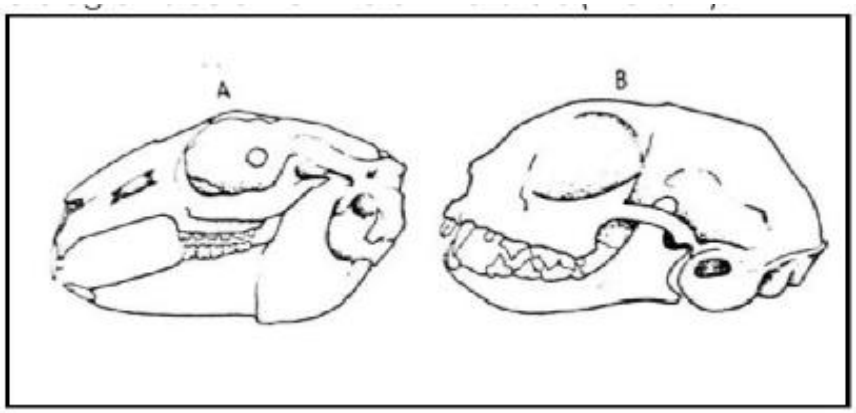
1.5.1 Give **the letter** of the parts that are responsible for the following:

(a) Protecting the lungs (1)
(b) Increasing the surface area for gaseous exchange (1)
(c) Preventing the trachea from collapsing (1)

1.5.2 Explain why the nose is better suited for breathing than the mouth. (2)

[5]

1.6 Study the diagram below of two animal skulls.



1.6.1 Identify which skull belongs to a

(a) herbivore (1)
(b) carnivore (1)

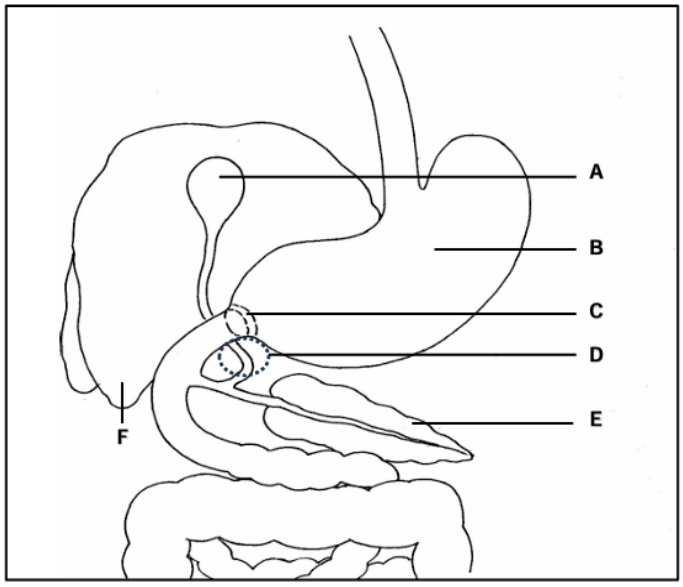
1.6.2 Give a reason for your answer to **QUESTION 1.6.1 (a)** (2)

[4]

TOTAL SECTION A: 50 MARKS

Section B
Question 2

2.1 The diagram below represents part of the digestive canal.



2.1.1 Identify:

(a) Part A (1)
(b) Part B (1)
(c) Part C (1)
(d) Part E (1)
(e) Part F (1)

2.1.2 Give **SIX** functions of part **F**. (6)

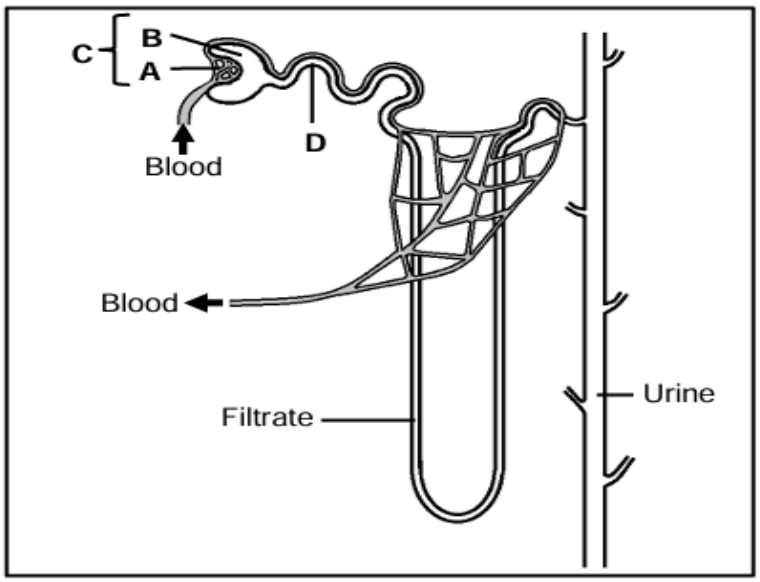
2.1.3 The acid produced in part B does not destroy its walls. Explain why this is possible. (2)

2.1.4 A person has consumed two large bars of chocolate and two cups of soft drink containing a high sugar content during lunch break. Describe the homeostatic process that restores the correct levels of glucose in the blood. (7)

2.1.5 Explain briefly what the difference between absorption and egestion is. (2)

[22]

2.2 The diagram below represents the structure of a nephron.



2.2.1 Identify the parts labelled:

(a) A (1)
(b) B (1)
(c) D (1)

2.2.2 Name the process that takes place at C. (1)

2.2.3 The concentration of various substances in the blood, filtrate and urine are given below.

Location	Urea g/100 cm^3	Glucose g/100 cm^3	Proteins g/100 cm^3	Salts g/100 cm^3
Blood at part **A**	0,03	0,10	8,00	0,72
Filtrate	003	0,10	0,00	0,72
Urine	2,00	0,00	0,00	1,50

Which of the substances shown in the table

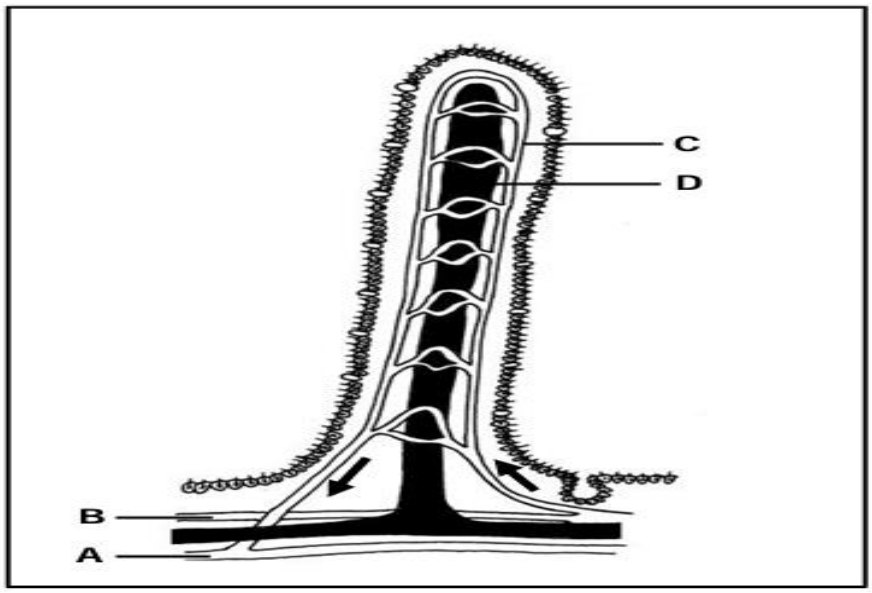
(a) did not move from the part labelled A to B? (1)
(b) is present in the filtrate, but is completely reabsorbed at part D? (1)
(c) reaches the highest concentration in the urine? (1)

2.2.4 Explain **TWO** structural adaptations of part the labelled D. (4)

2.2.5 List ONE way in which the information in the table would differ if it were applicable to a patient suffering from diabetes mellitus before any treatment was given. (2)

[13]

2.3 The diagram below represents a structure found in the small intestines of a human.



2.3.1 Identify the structure shown in the diagram above. (1)

2.3.2 Name the labelled part which is responsible for the absorption of:

(a) fatty acids and glycerol (1)
(b) glucose and amino acids (1)

2.3.3 Which **ONE** of the blood vessels (A or B) transports the highest amount of digested nutrients? (1)

2.3.4 State **TWO** processes responsible for the absorption of digested nutrients. (2)

2.3.5 In a table, compare the three enzymes (carbohydrates, proteins and lipids) that are involved in chemical digestion. Focus on where the substrates are produced and what the end product will be after digesting the substrate. (7)

2.3.6 Why is photosynthesis important to animals? (2)

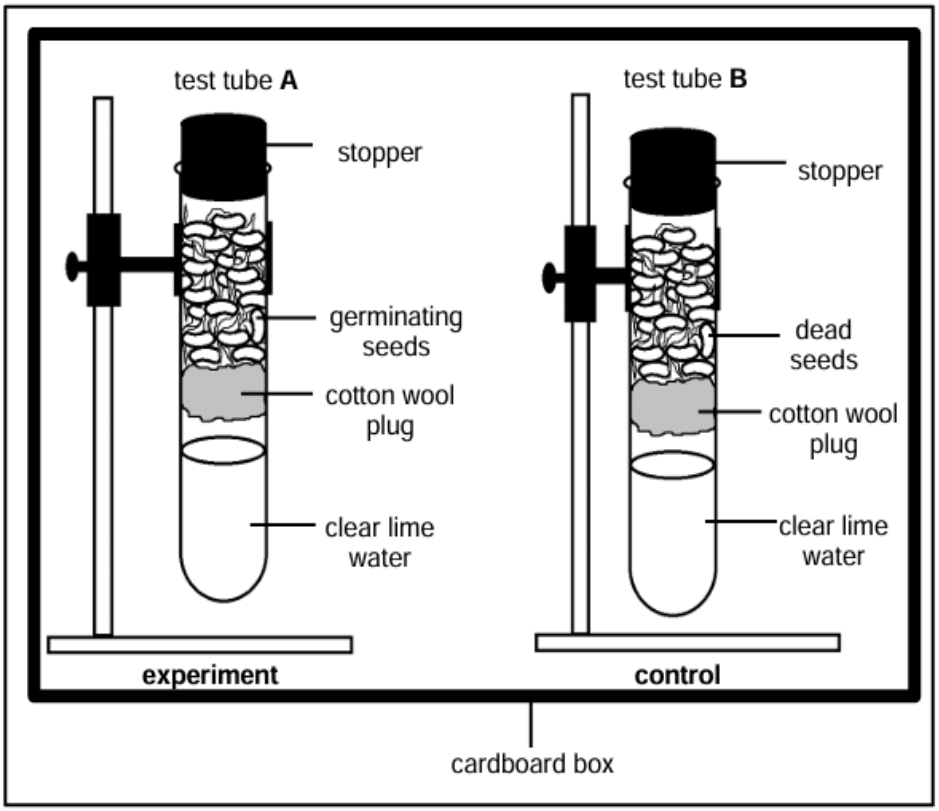
[15]

[50]

Question 3

3.1 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 the 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 up as shown



3.1.1 Write a hypothesis for the investigation. (2)

3.1.2 Why are germinating seeds used in the experiment? (3)

3.1.3 Explain why the result was different in the control part as compared to the experiment. (3)

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

3.1.5 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? (2)

3.1.6 Give a reason for keeping both sets of apparatus in a cardboard box. (2)

3.1.7 Name the gas released during cellular respiration. (2)

3.1.8 What was the test result for the gas mentioned in QUESTION 3.1.7? (2)

[18]

3.2 Answer the following questions about cellular respiration:

3.2.1 Write down the THREE phases of cellular respiration. (3)

3.2.2 In the first phase glucose is broken down into? (1)

3.2.3 In the second phase the two products that are released are called? (2)

3.2.4 In the third phase, what are the two products formed called? (2)

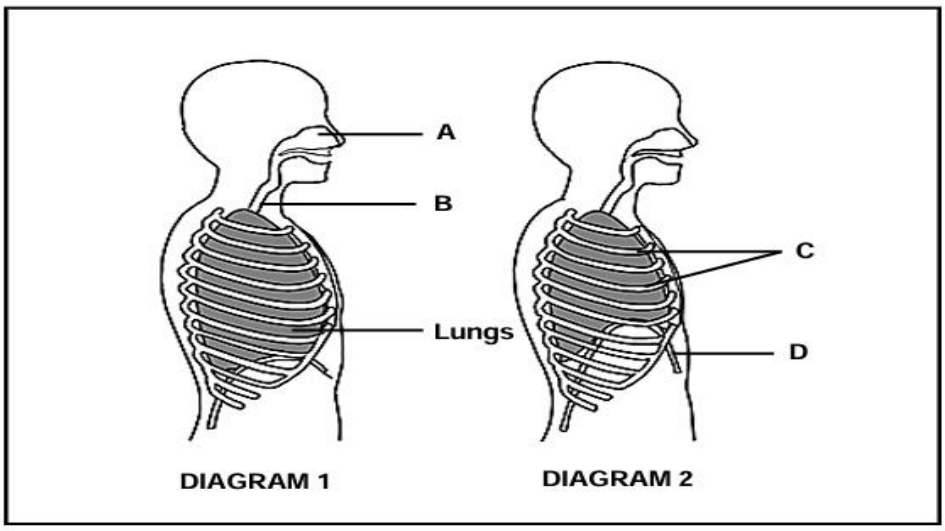
3.2.5 In which phase does anaerobic respiration occur? (1)

3.2.6 In which phase does aerobic respiration occur? (1)

3.2.7 Each of the above-mentioned phases comprises a sequence of chemical reactions. Why are so many chemical reactions necessary? (2)

[12]

3.3 The diagram below represents the process of breathing in humans.



3.3.1 Name the breathing muscles:

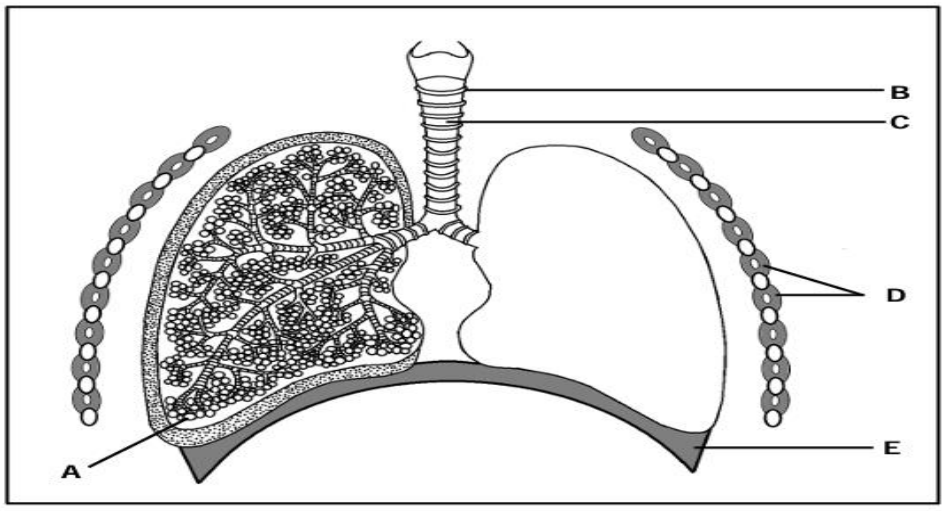
(a) represented by **D** (1)
(b) found between **C** (1)

3.3.2 Which diagram shows exhalation? (1)

3.3.3 State **TWO** observable features to support your answer in **QUESTION 3.3.2.** (2)

[5]

3.4 The diagram below represents the human lungs.



3.4.1 Identify parts:

(a) B (1)
(b) C (1)

3.4.2 Name the epithelial tissue that lines the inside of part **C**. (1)

3.4.3 State the function of part labelled **B**. (2)

3.4.4 Describe the process of inhalation. (5)

3.4.5 Identify part **A**. (1)

3.4.6 Which type of blood

(a) enters the blood capillary of part A? (1)
(b) leaves the blood capillary of part A? (1)

3.4.7 State **TWO** structural features of part A which makes it efficient for gaseous exchange in humans. (2)

[15]

[50]

TOTAL SECTION B:50 MARKS

TOTAL: 150 MARKS