



HILLCREST HIGH SCHOOL
GRADE 10
NOVEMBER 2021
LIFE SCIENCES – PAPER 1

Time: 2 hours

Marks: 100

EXAMINER: MRS L. PRIOR

MODERATORS: MRS R. HARMSE, MR A. MAHABEER.

N.B. This question paper consists of 3 Questions and 11 Pages.

INSTRUCTIONS TO CANDIDATES

READ THESE INSTRUCTIONS CAREFULLY BEFORE ANSWERING THE QUESTIONS.

1. Answer **ALL** the questions in the answer booklet provided.
2. Number the questions exactly as the questions are numbered.
3. Write neatly and legibly.
4. All drawings should be done in pencil and labelled in ink.
5. Use **ONLY** blue or black ink.
6. Non-programmable calculators, protractors and compasses may be used.

SECTION A:

QUESTION ONE:

1.1. Various possible options are provided as answers to the following questions/statements. Choose the correct answer and write **ONLY** the letter (A – D) next to the question number (1.1.1 – 1.1.10) in the answer book.

1.1.1. A food sample that turns blue/black in the presence of iodine.

- A. Protein
- B. Starch
- C. Glucose
- D. Lipid

1.1.2. Calcium is needed for...

- A. Bone and teeth formation.
- B. Prevention of muscular cramps.
- C. Osmoregulation.
- D. Thyroxin production.

1.1.3. An example of a monosaccharide is...

- A. Glucose
- B. Starch
- C. Cellulose
- D. Sucrose

1.1.4. Which of the following is **not** part of the axial skeleton.

- A. skull
- B. vertebrae
- C. ribs
- D. humerus

1.1.5. The part of the microscope that is used to focus a specimen.

- A. diaphragm
- B. objective lens
- C. coarse adjustment knob
- D. body tube

1.1.6. Chloroplasts are the site of...

- A. cellular respiration
- B. cellular division
- C. photosynthesis
- D. cytokinesis

1.7. The reagent used to test for the presence of lipids is...

- A. iodine
- B. ethanol
- C. Benedict's solution
- D. Sodium hydroxide and Copper sulphate

1.8. Stores cell sap.

- A. nucleus
- B. Golgi body
- C. mitochondrion
- D. vacuole

1.9. Starch is normally stored in...

- A. xylem
- B. phloem
- C. parenchyma
- D. collenchyma

1.10. The tissue that has a conductive and supportive function...

- A. phloem
- B. parenchyma
- C. xylem
- D. epidermis

(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 – 1.2.10).

1.2.1. The model that is used to describe the structure of the cell membrane.

1.2.2. The part of the skull that contains and protects the brain.

1.2.3. The building blocks of proteins.

1.2.4. Tissue that reduces friction between bones.

1.2.5. Nucleic acid found within chromosomes.

1.2.6. The phase in mitosis during which DNA replication occurs.

1.2.7. The outer most tissue layer in plant organs.

1.2.8. Vitamin that prevents night blindness.

1.2.9. Disorder that results in the yellowing of leaves.

1.2.10. Mineral required in the production of haemoglobin.

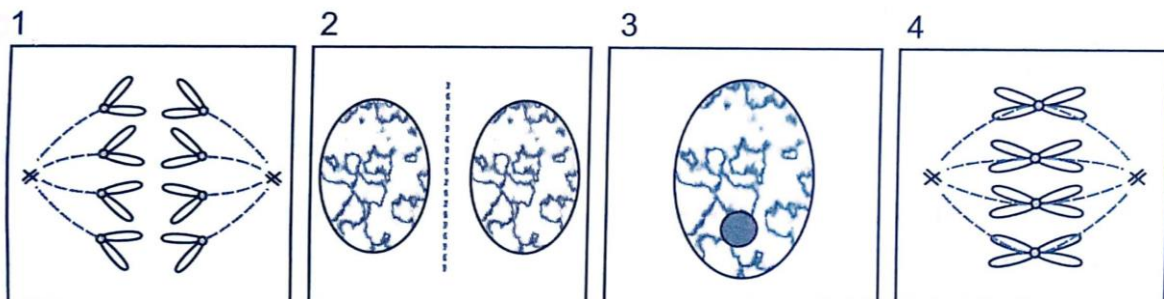
(10)

- 1.3. State whether for each of the phrases in COLUMN I, applies to **A only**, **B only**, **BOTH A and B** or **NONE** in COLUMN II.

COLUMN I	COLUMN II
1.3.1. Plastids that stores food in plant cells.	A. Chromoplasts
	B. Leucoplasts
1.3.2. Type of joint formed at the wrists.	A. Ball and socket
	B. Pivot
1.3.3. Pore on a leaf that allows for gaseous exchange.	A. Stoma
	B. Stroma
1.3.4. Bones of the wrist are called.	A. tarsals
	B. carpals
1.3.5. Companion cells form part of.	A. parenchyma
	B. xylem

(5)

- 1.4. The diagrams below show four stages of a cell undergoing cell division. Study the diagrams and answer the questions that follow.



- 1.4.1. Name the type of cell division shown above. (1)
- 1.4.2. Give the correct order of the diagram above to show how the process occurs. (4)
- 1.4.3. a) Name the phase visible in diagram **4**. (1)
 b) Explain what happens in this phase. (2)
- 1.4.4. State the number of chromosomes which will be present in each of the daughter cells at the end of this cell division. (1)
- 1.4.5. Give **ONE** reason why this type of cell division is biologically important. (1)

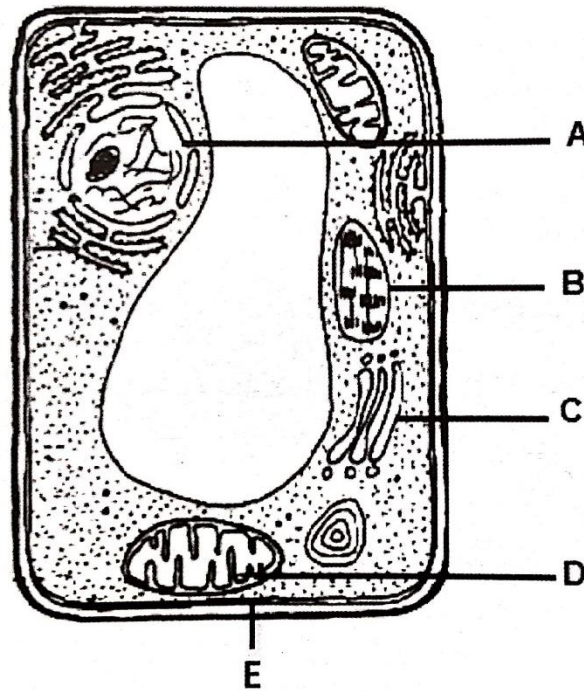
(10)

TOTAL SECTION A : 35

SECTION B:

QUESTION TWO:

2.1. Study the diagram below showing organelles found in a cell and then answer the questions that follow.



2.1.1. a) State whether this cell is an animal or plant cell. (1)

b) Write down **TWO** visible reasons for your answer. (2)

2.1.2. Write down the **LETTER** of the part that:

a) Contains chlorophyll. (1)

b) Has a secretory function. (1)

c) Contains chromosomes. (1)

2.1.3. Identity part labelled **E** and explain its function. (2)

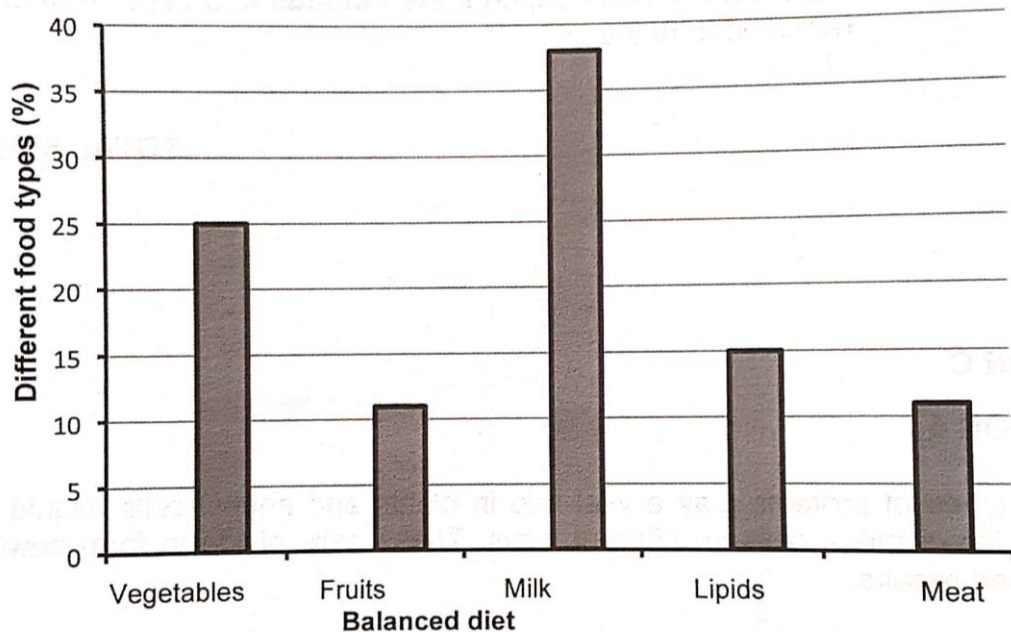
2.1.4. List **TWO** functions of organelle **A**. (2)

2.1.5. Make a fully labelled diagram of organelle **D**. (5)

(15)

2.2. An investigation was carried out to determine the percentage of different food types on a balanced diet.

The graph below shows the results of the investigation.



2.2.1. For this investigation identify the:

- a) Dependent variable (1)
- b) Independent variable (1)

2.2.2. Name **TWO** food types from the graph above that have the equal percentage in a balanced diet. (2)

2.2.3. Calculate the percentage difference between the vegetables and lipids in a balanced diet. Show all your working. (2)

2.2.4. State **ONE** way in which the reliability of the investigation can be increased.(1)

(7)

2.3. Study the data in the table below and answer the questions that follow:

Table showing the effect of temperature on the rate of enzyme activity.

TEMPERATURE (°C)	RATE OF REACTION (mg product per minute)
10	1,0
20	2,5
30	3,0
40	5,5
50	4,0
60	1,5

2.3.1. Draw a line graph to show the results from the table above. (5)

2.3.2. How does an increasing temperature from 10°C effect the rate of reaction. (1)

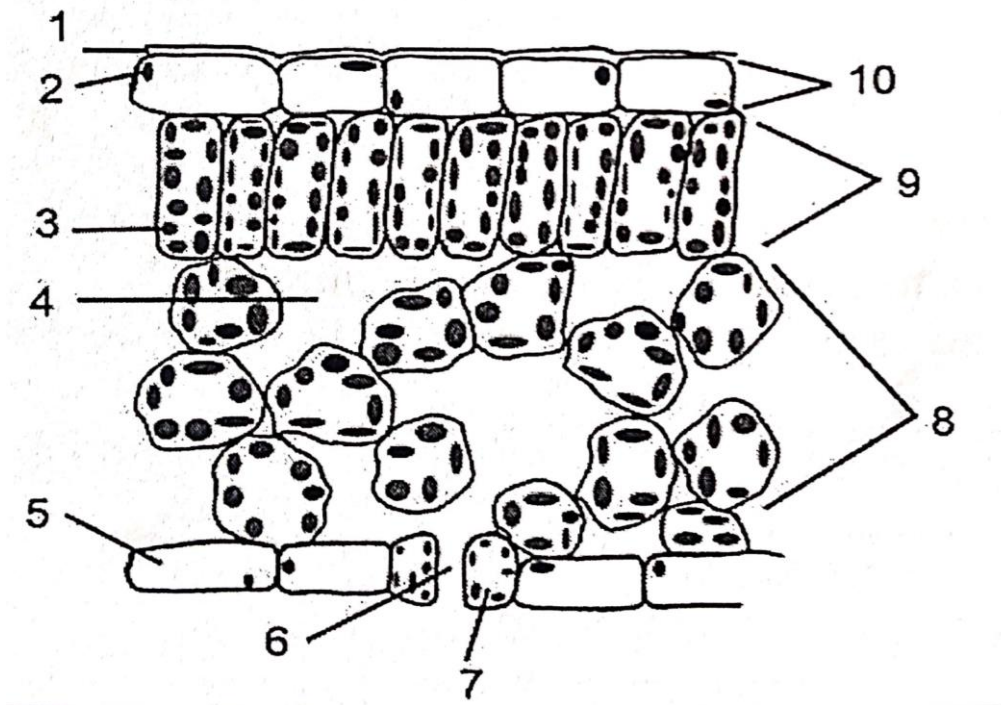
2.3.3. State the optimum temperature for enzyme activity and give a reason for your answer. (2)

(8)

Question 2 = 30

QUESTION THREE:

3.1. Study the diagram of a leaf below and answer the questions that follow:



3.1.1. Identify the tissues labelled **8**, **9** and **10**. (3)

3.1.2. Write down the **LETTER** of the part that:

a) controls the opening for gaseous exchange to occur. (1)

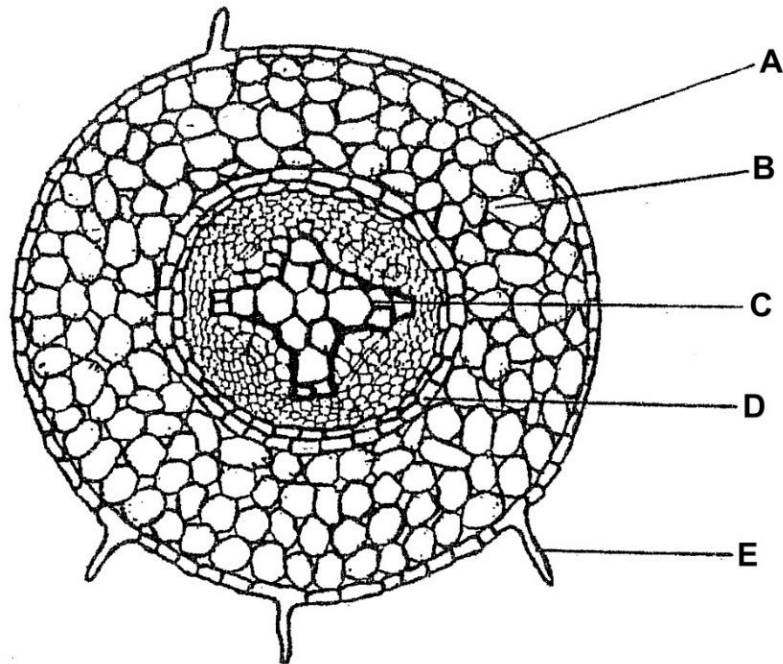
b) undergoes the process of photosynthesis. (1)

3.1.3. Provide the name and function of the part labelled **1**. (2)

3.1.4. Explain why the cells labelled **9** are arranged in such a way. (1)

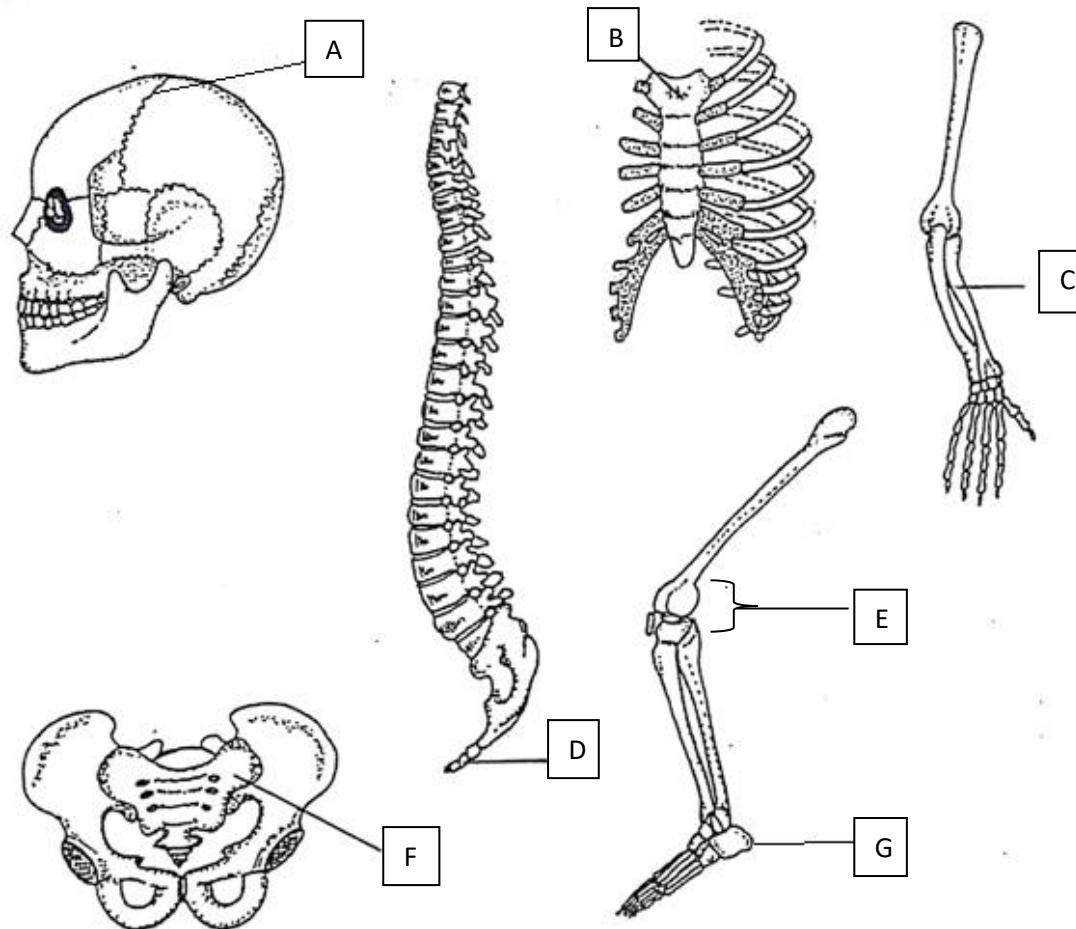
(8)

- 3.2. The diagram below shows a cross section through a plant organ.
Study the diagram and then answer the questions that follow.



- 3.2.1. a) Name the plant organ from which this section is taken from. (1)
b) State its function. (1)
- 3.2.2. Identify the parts labelled **A** and **C**. (2)
- 3.2.3. Explain how tissue labelled **C** is structurally suited to its function. (1)
- 3.2.4. Name the part labelled **E** and discuss **ONE** way in which this cell is structurally suited to its function. (2)
- (7)**

3.3. Study the following diagrams below showing different parts of the human skeleton.



- 3.3.1. a) Identify this type of skeleton. (1)
 b) List **THREE** functions of this type of skeleton. (3)
- 3.3.2. Identify the parts of the skeleton labelled **B, C, D, F** and **G**. (5)
- 3.3.3. Name the type of joint labelled **A** and **E**. (2)
- 3.3.4. Write down the name of the structure that:
- a) Connects bone to bone. (1)
 - b) Connects muscle to bone. (1)
 - c) Contracts and relaxes to bring about voluntary movement. (1)
- (14)**

3.4. The appendicular skeleton consists of 2 girdles, name both of these girdles and identify the parts of the skeleton that they consist of. (6)

Question 3 = 35

TOTAL SECTION B : 65

