STUDENT'S NAME _____

THE UNITED REPUBLIC OF TANZANIA

PRIME MINISTER'S OFFICE

REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

ENG. STELLA MANYANYA SECONDARY SCHOOL

FORM ONE ANNUAL EXAMINATION 2026

033 **BIOLOGY**

TIME: 03:00 HOURS **NOVEMBER 2026**

Instructions

1. This paper consists of a total of **Ten (10)** questions.
2. Answer **All** questions
3. Section A carries fifteen **(15) marks**, Section B **seventy (70)** marks and section C carries **fifteen (15)** marks
4. All writings should be in **blue** or **black** ink, Except drawings which should be in Pencil
5. Cellular Phones and any unauthorized material(s) are **Not** allowed in the examination Room
6. Write your **Full name** in every page of your answer sheet(s)

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SECTION A (15 Marks)

*Answer **all** questions in this section.*

1. Choose the most correct option from the alternatives given and write its letter in your answer booklet.

i. A Form One student observed that when a potted plant is placed near a window, its shoot bends towards the direction of light. Which characteristic of living things is best demonstrated by this response?
A. Excretion
B. Irritability (Sensitivity)
C. Respiration
D. Nutrition

ii. When setting up a biology laboratory experiment to test for the presence of starch in a leaf, a student accidentally spilled ethanol onto the workbench near an open flame. Which First Aid / Safety symbols on the laboratory chemical bottle should have warned the student beforehand?
A. Toxic symbol
B. Flammable symbol
C. Corrosive symbol
D. Explosive symbol

iii. During a scientific investigation on seed germination, a student kept temperature, moisture, and seed batch constant while changing only the amount of light supplied to different setups. In scientific methodology, the amount of light represents the:
A. Controlled variable
B. Dependent variable
C. Independent variable
D. Qualitative observation

iv. A student examining a cheek cell under a light microscope adjusted the fine adjustment knob but noticed the image remained dark and unclear. Which part of the microscope should be adjusted to increase light intensity on the slide?
A. Eyepiece lens
B. Diaphragm and mirror
C. Objective lens
D. Stage clips

v. Plant cells maintain a firm, rigid shape when fully hydrated, preventing them from bursting. Which cell organelle and structural feature are primarily responsible for maintaining this turgidity and structural support?
A. Cell membrane and lysosome
B. Large central vacuole and cell wall
C. Mitochondrion and cytoplasm
D. Ribosome and Golgi apparatus

vi. Biologists classify houseflies as *Musca domestica*. According to the binomial system of nomenclature, the word *Musca* represents the organism's:
A. Species name
B. Family name
C. Genus name
D. Order name

vii. Why are viruses considered a bridge between living and non-living things by modern taxonomists?
A. They possess a complete cell structure with cytoplasm and nucleus.
B. They can feed and move independently in soil.
C. They show no metabolic activity outside host cells but replicate inside living host cells.
D. They contain both cell walls and chloroplasts.

viii. Bacteria are classified under Kingdom Monera. Which key cellular feature distinguishes them from organisms in Kingdom Protoctista?
A. Absence of a membrane-bound nucleus (Prokaryotic nature)
B. Presence of multiple mitochondria
C. Ability to perform photosynthesis using chloroplasts

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D. Multicellular body organization

ix. A variegated leaf (having green and white patches) was exposed to sunlight for 6 hours and then tested for starch. Starch was detected only in the previously green areas. What does this observation prove?
A. Carbon dioxide is necessary for photosynthesis.
B. Light is not required for starch formation.
C. Chlorophyll is essential for photosynthesis.
D. Water is absorbed through the stomata.

x. A farmer noticed that maize plants in his farm had stunted growth, yellowish leaves (chlorosis), and poor root development. A agricultural officer identified a mineral deficiency. Which pair of essential macro-elements is most likely lacking in the soil?
A. Iron and Copper
B. Nitrogen and Phosphorus
C. Iodine and Zinc
D. Calcium and Chlorine

ANSWERS

i	ii	iii	iv	v	vi	vii	viii	ix	x

2. Match the characteristics or representative organisms of Kingdoms in **LIST A** with their corresponding Kingdom names in **LIST B** by writing the correct letter beside the item number.

LIST A	**LIST B**
(i) Unicellular prokaryotic organisms that lack a true membrane-bound nucleus (e.g., *Escherichia coli*).	A. Kingdom Fungi
(ii) Eukaryotic organisms, mostly unicellular or simple multicellular, including amoeba and paramecium.	B. Kingdom Monera
(iii) Heterotrophic eukaryotic organisms with cell walls made of chitin, reproducing mainly by spores (e.g., bread mold).	C. Kingdom Plantae
(iv) Multicellular autotrophic organisms with cellulose cell walls capable of performing photosynthesis.	D. Kingdom Animalia
(v) Multicellular heterotrophic organisms lacking cell walls and capable of locomotion.	E. Kingdom Protoctista
	F. Viruses
	G. Kingdom Archaea
	H. Mosses

ANSWER

i	ii	iii	iv	v

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SECTION B (70 Marks)

*Answer **all** questions in this section.*

3. While carrying out a field study in a school garden, Form One students collected various specimens including a toad, a mushroom, a dry leaf, and a piece of rock.
(a) Define the term **Biology** and state its two main branches. *(3 marks)*
Definition _____
_____
Branches
(i) _____
(ii) _____
(b) Explain **two (2)** reasons why a piece of rock is categorized as a non-living thing, whereas a toad is categorized as a living organism. *(4 marks)*
(i) _____
_____
_____
(ii) _____
_____
_____
(c) State **three (3)** applications of studying Biology in daily life, such as healthcare and agriculture. *(3 marks)*
(i) _____
(ii) _____
(iii) _____

4. A group of students wanted to investigate whether moisture is necessary for bread mold (*Rhizopus*) to grow. They placed dry bread in Jar A and moist bread in Jar B at room temperature for five days.
(a) Identify the **hypothesis** for this experiment. *(2 marks)*
_____
_____
(b) Outline **three (3)** sequential steps of the **scientific method** followed after formulating a hypothesis. *(6 marks)*
(i) _____
(ii) _____
(iii) _____
(c) Why is it necessary to include a **control experiment** in scientific investigations? *(2 marks)*
_____
_____
_____

5. Form One students observed plant cells under a light microscope as illustrated in the structural diagram below.

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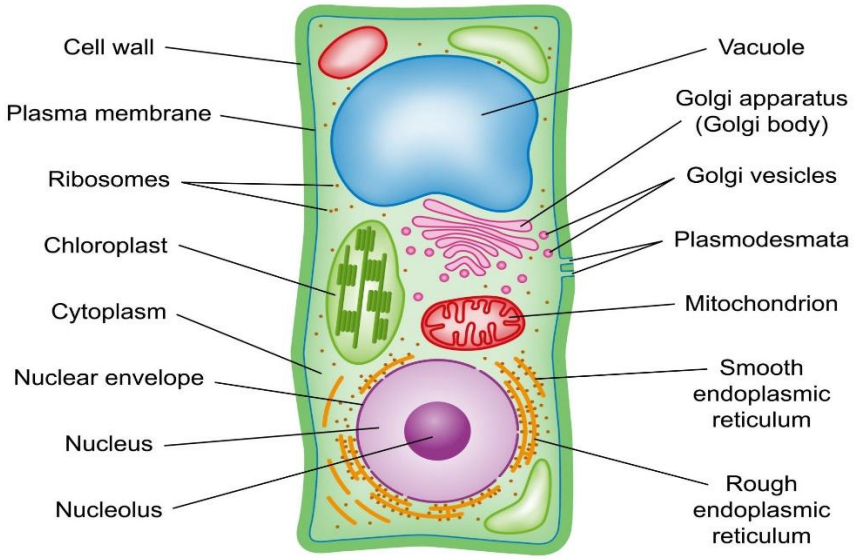

(a) Identify **three (3)** structures visible in the plant cell diagram above that are **absent** in a typical animal cell. *(3 marks)*

(i) _____

(ii) _____

(iii) _____

(b) State the primary function of each of the following cell organelles:

(i) Mitochondrion

_____

_____

(ii) Cell membrane

_____

_____

(iii) Chloroplast (3 marks*)*

_____

_____

(c) Calculate the total magnification of a microscope if the objective lens magnification is ×40 and the eyepiece lens magnification is ×10. Show your working. *(4 marks)*

_____

_____

_____

_____

6. During a local health drive, a health officer informed villagers about disease outbreaks caused by microscopic agents, explaining that some are non-cellular (viruses) while others are cellular (bacteria and fungi).

(a) Give **two (2)** structural characteristics of viruses that distinguish them from bacteria. *(4 marks)*

(i) _____

(ii) _____

(b) Mention **two (2)** common human diseases caused by viruses and **two (2)** caused by pathogenic bacteria. *(4 marks)*

Diseases caused by bacteria

(i) _____

(ii) _____

Diseases caused by viruses

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(i) _____
(ii) _____
(c) Why are antibiotics effective against bacterial infections but ineffective against viral infections? *(2 marks)*

_____
_____
_____

7. A biology teacher brought living specimens to class: a fern plant, a mushroom, an amoeba, and a housefly. She asked the class to group them using scientific classification rules.
(a) Differentiate between **Natural System of Classification** and **Artificial System of Classification**. *(4 marks)*

Natural System of Classification	**Artificial System of Classification**.
i.	
ii.	

(b) List the **seven (7)** hierarchical taxonomic ranks of classification in order from the highest (broadest) to the lowest (most specific). *(3.5 marks)*
(i) _____
(ii) _____
(iii) _____
(iv) _____
(v) _____
(vi) _____
(vii) _____
(c) State **three (3)** rules followed when writing scientific names of organisms using the Binomial System of Nomenclature. *(2.5 marks)*
(i) _____
_____
(ii) _____
_____
(iii) _____
_____

8. The diagram below shows the internal structure of a specialized organelle where green plants capture sunlight energy to synthesize organic food.

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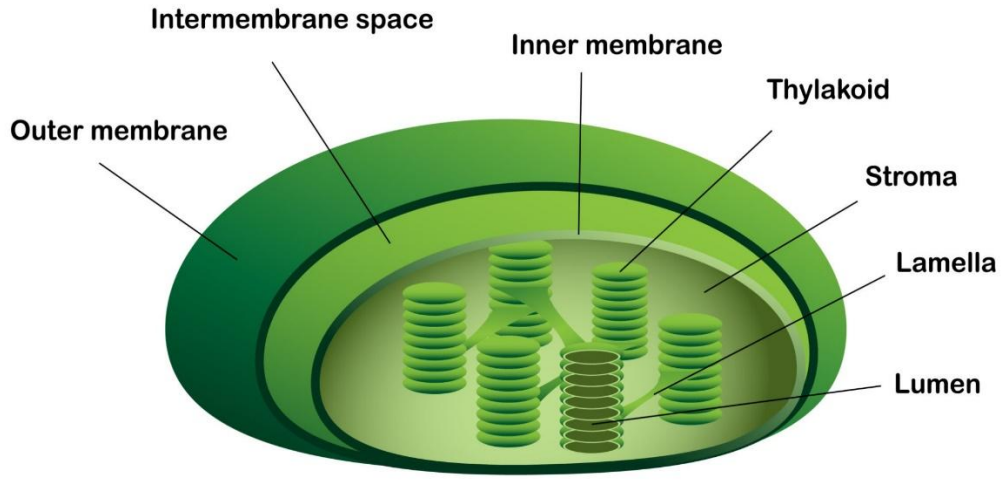
Cell organelles

Chloroplast



(a) Define "Photosynthesis" and write its balanced word equation. *(4 marks)*
Definition _____
_____
Equation

(b) Explain the essential roles of thylakoids (grana) and stroma during the light-dependent and light-independent stages of photosynthesis. *(4 marks)*
_____
_____
_____
_____

(c) Name **two (2)** internal structural adaptations of a dicotyledonous leaf for efficient photosynthesis. *(2 marks)*
(i) _____
(ii) _____

9. A farmer grew maize crops in two adjacent plots: Plot X received balanced inorganic fertilizers containing Nitrogen, Phosphorus, and Potassium (NPK), while Plot Y received no fertilizer. After six weeks, plants in Plot Y showed distinct deficiency symptoms.
(a) Differentiate between Macro-elements and Micro-elements required by plants, giving one (1) example for each. *(4 marks)*

Macro-elements	**Micro-elements**

(b) Describe the specific deficiency symptoms shown by plants lacking:
(i) Nitrogen
_____
_____

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(ii) Phosphorus (4 marks)

_____

_____

(c) State **two (2)** factors that affect the rate of photosynthesis in green plants. *(2 marks)*

(i) _____

(ii) _____

SECTION C (15 Marks)

*Answer **one (1)** question from this section.*

10. *"Although green plants are primary producers that manufacture food through autotrophic nutrition, several environmental and internal conditions must be present for this process to take place successfully."*

Examine **five (5)** factors (both internal and external) that affect the rate of photosynthesis in green plants.