

NAME.....Stream.....

P530/1
S5 BIOLOGY
(Theory)
Paper 1
17th April, 2026
2¹/₄ Hours



END OF TEARM I EXAMINATIONS
Uganda Advanced Certificate of Education

S5 BIOLOGY
(THEORY)

Paper 1

2 hours and 15 minutes

INSTRUCTION TO LEARNERS:

- *This paper consists of **three compulsory items.***
- *Read each item carefully, organizes your responses and present them logically and precisely.*
- *Use only the spaces provided.*
- *Any responses outside the space provided will not be scored.*

For Scores' Use Only

| Item No. | Basis code | Weighted Score | Scorer's Initials |
|-----------------------------|-------------------|-----------------------|--------------------------|
| 1 | U | | |
| | A | | |
| 2 | U | | |
| | A | | |
| 3 | U | | |
| | A | | |
| Total Weighted Score | | | |

Turn Over

Attempt all items

Item 1

The Budo swimming team is undergoing intensive training for the National Inter-School Games. During a nutrition session, the team doctor explains that the athletes' performance depends heavily on the "chemical harmony" of their bodies. He provides the students with a table comparing two substances found in the human body: **Water** and **Triglycerides (Fats)**.

| Property | Water | Triglycerides (Fats) |
|----------------|-------------------------------------|---|
| Solubility | Universal solvent for polar solutes | Insoluble in water; soluble in organic solvents |
| Energy Density | 0kJ/g | 38kJ/g |
| Interactions | Forms hydrogen bonds | Hydrophobic interactions |

Tasks:

- (a) Based on the data, explain how the interaction of water with polar substances differs from its interaction with non-polar substances (like lipids), and why this difference is vital for maintaining cellular structure.

For score's Use Only

| | |
|-------------------|---|
| Basis code | U |
| Score | |

(b) An athlete is concerned about their ability to sustain energy during long-distance swimming events without feeling "weighed down." Using the provided data on solubility and energy density, explain why lipids are a more efficient choice for long-term energy storage compared to substances that interact freely with water.

For score's Use Only

| | |
|-------------------|----------|
| Basis code | A |
| Score | |

Item 2

A laboratory technician at the Budo Biology Department accidentally mixed three slides labeled **Sample X**, **Sample Y**, and **Sample Z**. To identify them, a student used an electron microscope and recorded the following observations:

| Feature | Sample X | Sample Y | Sample Z |
|-------------------------|---------------------------|-----------------------------|--------------------------|
| Cell Wall | Present (Peptidoglycan) | Present (Cellulose) | Absent |
| Genetic Material | Circular DNA in cytoplasm | DNA inside a nucleus | DNA inside a nucleus |
| Organelles | Only Ribosomes (70S) | Mitochondria & Chloroplasts | Mitochondria & Lysosomes |
| Plasma Membrane | Fluid Mosaic Model | Fluid Mosaic Model | Fluid Mosaic Model |

Tasks:

(a) Identify the categories of cells (Prokaryotic or Eukaryotic) for Samples X and Y. Use the data to justify your distinction based on their internal ultrastructure.

For score's Use Only

| | |
|-------------------|----------|
| Basis code | U |
| Score | |

(b) In a medical emergency, a person is accidentally injected with distilled water instead of saline. Using your knowledge of the **plasma membrane structure**, predict the effect on the patient's red blood cells (similar to Sample Z) and explain the biological consequence.

For Score's Use Only

| | |
|-------------------|----------|
| Basic code | A |
| Score | |

For score's Use Only

| | |
|-------------------|----------|
| Basis code | U |
| Score | |

(b) During a prolonged drought in Budo, the succulent herbs wilted significantly while the trees remained upright. Explain the physiological role of **Parenchyma** in the wilting process and suggest why the trees did not show the same physical collapse.

For Score's Use Only

| | |
|-------------------|----------|
| Basis code | A |
| Score | |

END