

NAME: ..... SIGN: .....

530/1

Biology

(Theory)

Paper 1

2 ½ Hours.

Uganda Advanced Certificate of Education

End of Term II Examination 2025

Biology

Paper 1

Time: 2 Hours: 30 minutes

**INSTRUCTIONS TO CANDIDATES:**

- *Attempt all the 4 items in this paper.*
- *Candidates are advised to read the questions carefully, organize their answers and present them precisely and logically.*
- *Unnecessary crossing of work may lead to loss of marks.*

# ITEM 1

John is a 17-year-old student who has just completed a 100-meter sprint during a school athletics competition. Immediately after the race, he notices that his heart is pounding rapidly. Ten minutes later, while resting under a tree, his heartbeat gradually slows back to normal.

His blood pressure returns to normal i.e. 120 mmHg systolic/80 mmHg diastolic. He is confused of how his body is capable of stabilizing his heartbeat rate and pressure back to normal after the race.

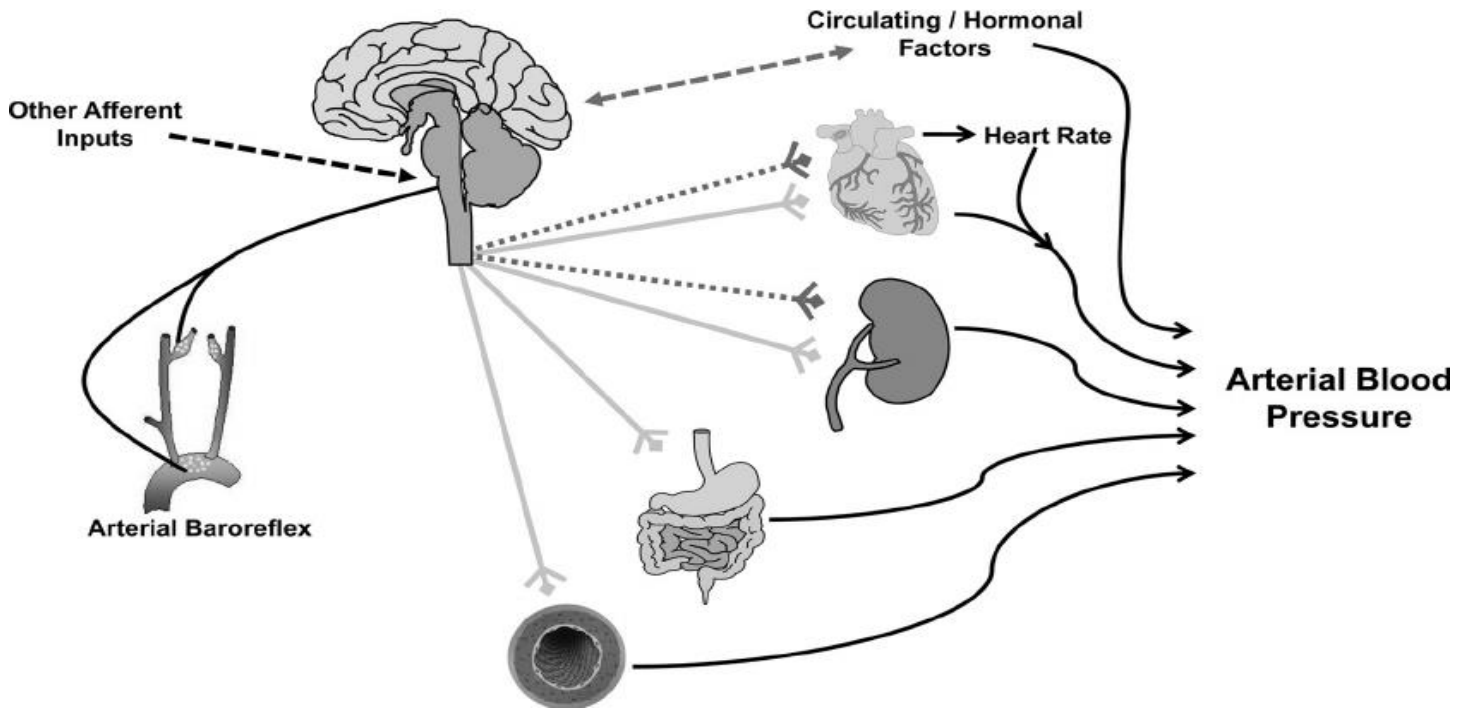


Fig 1: Support Material

## Task

As a biology student

- (a) Help John identify the structures involved in the process described in the scenario above. (03 scores)

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- (b) Explain how the organs coordinated to restore the heart beat (8 scores)

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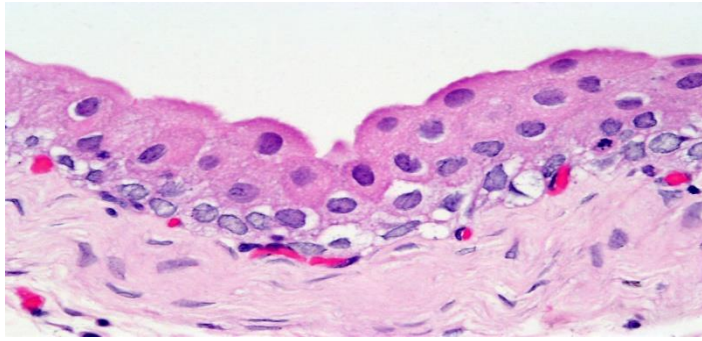


Figure 2: Support Material

Slide B shows tightly packed flat cells with layers, forming a dry, outer protective surface.

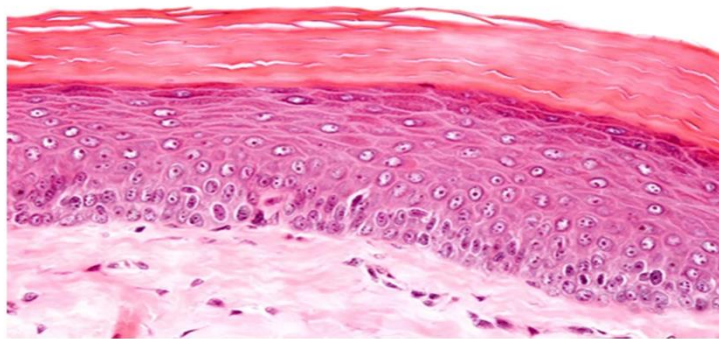


Figure 3: Support Material

Slide C shows ciliated cells with goblet cells interspersed among them.

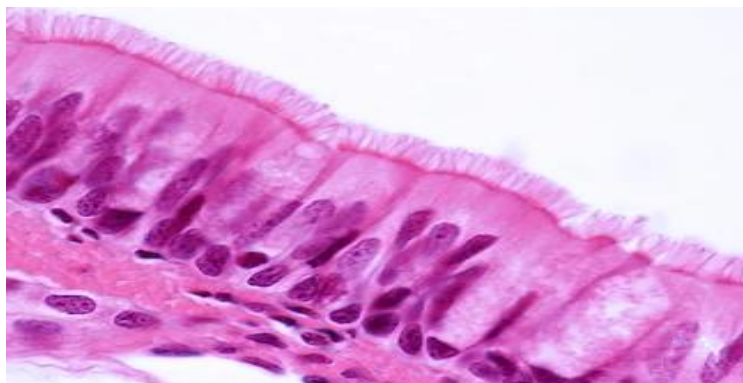


Figure 4: Support Material





(b) Explain the effect that would be observed if Sarah added lactate dehydrogenase to starch at 37°C. (3 scores)

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(c) Suggest other factors (apart from temperature) that Sarah should keep constant during this experiment and explain why. (4 marks)

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(d) With reference to the International Union of Biochemistry and Molecular Biology (IUBMB) classification system of enzymes, identify the categories to which lactate dehydrogenase and amylase fall. (2 scores)

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#### ITEM 4

Michael is a 28-year-old man who recently tested positive for HIV. In the weeks following the infection, he experiences flu-like symptoms that eventually subside. For several years afterward, he feels healthy and shows no obvious symptoms, although regular tests show gradual changes in his immune cell counts. Around 11 years after the initial infection, his health starts to deteriorate rapidly, and he is diagnosed with AIDS.

The doctor shows Michael a graph explaining the typical progression of HIV infection, including changes in CD4<sup>+</sup> T cells, CD8<sup>+</sup> T cells, and plasma viral load over time.



