

Student's name..... Signature

Stream

553/1
BIOLOGY
(Theory)
Paper 1
NOV/ 2023
2 ½ hours



UGANDA CERTIFICATE OF EDUCATION.
COMPETENCE BASED ASSESSMENT EXAMINATIONS
MID TERM III EXAMS 2023
BIOLOGY
(THEORY)
PAPER 1
S.2
2Hours: 30 minutes

INSTRUCTIONS:

• *This paper consists of section A and section B, Section A consists of five questions and B one question.*

Attempt all questions in section A and in section B.

• *Answer **all** questions in section A in the spaces provided.*

• *Illustrations in form of drawings should be made where necessary, with a sharp pencil.*

For official use only *Indicate question attempted in section B in table below.*

Section	Question	Marks/scores	Teacher's comment
A	1		
	2		

	3		
	4		
	5		
B			

SECTION A. (60MARKS)

1. During a research conducted by microbiologists, a conclusion was made that many microorganisms are responsible for the increasing both human infections and plant diseases, of which bacteria was a major concern in their study. During the study, they grouped the bacteria, basing on both dependence of oxygen for survival and shapes of the bacteria. In their conclusion also, they clarified how bacteria are important to farmers.

(a) (i) Give a reason why bacteria are called microorganisms. (01mark)

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(ii) State two ways how bacteria can be grouped basing on their shape. Give a reason for your answer. (02marks)

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(b) Basing on dependence of oxygen for survival, microbiologists used a term anaerobic bacteria. State what is meant by anaerobic bacteria. (01mark)

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(c) Describe two ways how bacteria are important to farmers. (02marks)

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(d) State any two diseases caused by bacteria in animals. (02marks)

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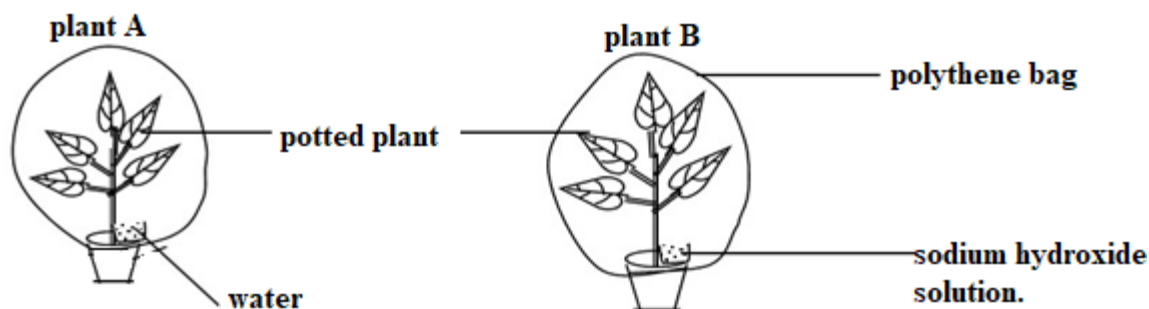
(e) how do ruminant animals depend on bacteria for digestion. (02marks)

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2. During an investigation of both the factors that affect the rate of photosynthesis and whether starch is formed during photosynthesis by S.2 students of SENK, two potted plants A and B were used and the plants were first kept in darkness for two hours, then after a leaf was detached and tested for starch. After the two days, the students then carried the two potted plants and placed them in direct sunlight for three hours after which they tested for starch from each plant again. Study the two setups below carefully and answer the questions that follow.



(a) (i) Give a reason why the potted plants were kept in darkness for two days. (01mark)

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(ii) State the role of sodium hydroxide in potted plant B in relation to the factor under investigation. (01mark)

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(b) During the test for starch, learners;

- Removed a leaf from the two potted plants both before and after exposing the plants to sunlight and then placed them separately in boiling water for 5 minutes.
- Then separately placed the leaves in a beaker containing alcohol and boiled using a water bath. The leaves were then washed in hot water.

- After which leaves were spread on a white surface tile and drops of iodine added on each leaf.

State what was observed with the leaf;

- (i) Used before placing the potted plants in direct sunlight. (01mark)

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- (ii) From potted plant A after placing the plants in direct sunlight. (01mark)

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- (iii) From potted plant B after placing the plants in direct sunlight. (01mark)

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- (c) Explain the significance of the following during the experiment.

- (i) Spreading the leaves on a white surface tile before adding drops of iodine. (01mark)

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- (ii) Addition of iodine solution drops to leaves in the above experiment. (01mark)

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- (iii) Leaves were placed in boiling water for 5 minutes. (01mark)

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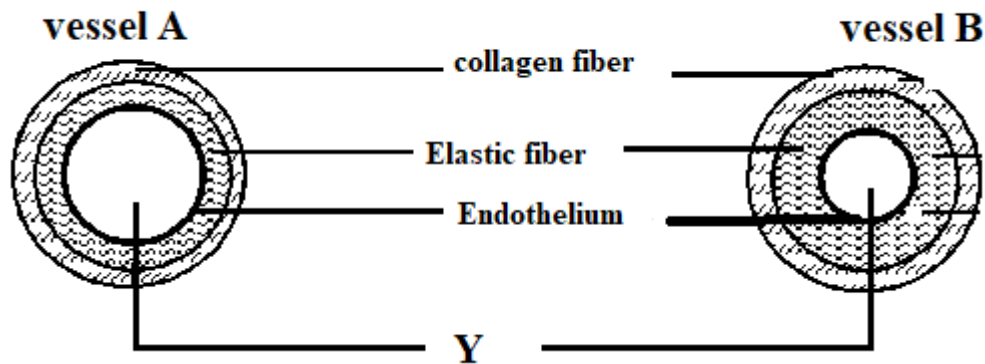
- (iv) Leaves were boiled in alcohol. (01mark)

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- (d) State any two other factors that affect the rate of photosynthesis. (01mark)

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3. Dr. Nambasi when addressing the nation about the different diseases that affect human circulatory system, he said, ‘circulatory system consists of the pumping organ, circulating fluid and the channels/tube-like structures. He used the vessels below A and B in differentiating the categories of channels through which a circulating fluid. Use the following vessels and attempt the following questions.



(a) (i) Which organ in the body did Dr. Nambasi refer to as the pumping organ? (01mark)

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(ii) Identify which channel of the circulatory system is vessel A. Give a reason for your answer. (02marks)

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(b) (i) State two structural differences between vessel A and vessel B. (02marks)

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(ii) Describe how the structural differences given above are significant in the functioning of vessels. (04marks)

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(c) State one function of a circulating fluid in the circulatory system. (01mark)

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4. During a research study by World Health Organization, after covid 19 pandemic periods about physical activity, eating disorders and body mass index (BMI) among university students, it was

discovered that there is a sharp increase in eating disorders among university students since covid 19 pandemic, among which emphasis was on bulimia and anorexia.

(a) Describe any two causes of increasing eating disorders among university students. (02marks)

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(b) Distinguish between bulimia and anorexia as identified among students. (03marks)

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(c) In an attempt to get body mass index of students, john and tom where used in the study. When the body measurements of Tom and John were taken at the university, John had 60kgs and height of 1.5m while Tom had 40kgs and height of 1.7m.

(i) State the significance of taking body mass index. (01mark)

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(ii) Determine the body mass index of the two students, Tom and John. Give a comment on the body mass index of the two university students. (03marks)

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(d) State any two risks/ dangers of overweight. (02marks)

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5. Tobi amusan an athlete in Africa, during her interview after winning the Olympics medal 2022, she narrated how her life journey started and why she was grateful for the great achievement. In the story, she experienced many challenges in the start of the hobby, where she could experience muscle cramps during running and also she could breathe faster and deeply and

faster just after running. When asked on which things she could eat before a run, only glucose and water she replied. Study the race in picture below and attempt the following questions.



(a) Describe how respiration was a key factor in the victory of Tobi amusan. (03marks)

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(b) During running, both aerobic and anaerobic respiration occurs; Tobi amusan claimed.

(i) State why anaerobic respiration during running. (02marks)

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(ii) State three differences between aerobic and anaerobic respiration during running. (03marks)

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(c) Explain why Tobi amusan could

(i) Suffer from muscle cramps during faster running. (02marks)

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(ii) Breathe faster and deeply after running.

(02marks)

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(d) Give a reason why athletes are given glucose than eating food five minutes to the start of the race.

(02marks)

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SECTION B. (25MARKS)

6. Majje went to super classic hotel in kavudo Sub County. He was given black tea with much sugar and eggs for breakfast because the other food types were over. After eating, he carried some tea in his bottle and a piece of egg to one of the school's laboratory to investigate the food samples in the tea and eggs. After reaching the lab, he organized the following laboratory reagents and apparatus.

Iodine solution, retort stand , test tubes, measuring cylinder, filter funnel, filter paper, test tube rack, labels, droppers, Benedicts solution, hot water bath labels, test tube holder, distilled water, pestle and mortar

Using the apparatus and reagents provided, design and carry out an experiment to investigate whether each of the food samples contains starch, reducing sugars, proteins or not. (25marks)

Your experiment planning should include the following aspects:

- i. Title of experiment.**
- ii. Aim of experiment.**
- iii. Hypothesis.**
- iv. Variables**
- v. List of apparatus and materials used**

- vi. Procedure**
- vii. Presentation of data.**
- viii. Conclusion.**
- ix. Explanation of your hypothesis**