

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

P533/1  
BIOLOGY  
Paper 1  
Term 1 2023  
2 hours



## COMPREHENSIVE BIOLOGY TRANSFORMATION INITIATIVE

### LOWER SECONDARY CERTIFICATE OF EDUCATION

COMPETENCE BASED EXAMINATION

END OF TERM 1 2023

BIOLOGY PAPER 1

SENIOR THREE

TIME: 2 HOURS

### INSTRUCTIONS

- ✓ This paper consists of two sections A and B.
- ✓ Attempt all questions in section A.
- ✓ Write answers in the spaces provided in section A.
- ✓ Attempt only four questions from section B.
- ✓ Write the questions attempted from section B in their order in the table below.
- ✓ Use a neat hand-writing to present your answers precisely and carefully.

### FOR EXAMINER'S USE ONLY

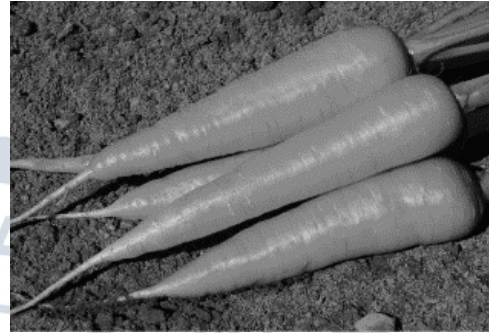
SECTION	NUMBER	MARKS
A	1.	
	2.	
	3.	
	4.	
	5.	
B	No.	
	No.	
	No.	
	No.	
TOTAL		

## SECTION A: (40MARKS)

- 1.** When we look around us, we see a variety of plants. Plants are very important organisms that possess different structures such as roots, stems and leaves. They use these organs to survive and perform several processes. In the figure below, two root modifications are shown from different plants. Read them carefully and use them to answer questions that follow.



**A**



**B**

- a) Identify the above root modifications. (02marks)

A..... B.....

- b) Name the plant that possess each leaf modification. (02marks)

A.....

B.....

- c) How is each root modified to perform its function. (02marks)

A.....

.....

B.....

.....

- d) What do you the above roots are similar in their function to the plant possessing them. (02marks)

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- 2.** You are provided with pictures of different organisms that are obtained from a common phylum of kingdom Animalia. Use the pictures provided to answer questions that follow.



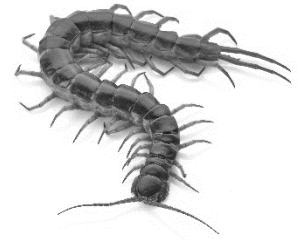
**P**



**Q**



**R**



**S**

a) (i) State the phylum from which the above organisms were obtained.

**(01mark)**

(ii) Basing on your answer in a) (i) above, give two reasons to support your answer.

**(02marks)**

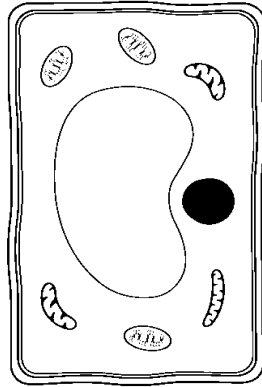
b) Construct a dichotomous key to classify the above organisms.

**(03marks)**

c) How do you think organism Q able to survive in its habitat.

**(02marks)**

3. A cell is a basic unit of function and structure of life. Cells perform a variety of functions that help to maintain life of organisms. The processes that occur in cells take place in distinct structures in cells called organelles. The figure below shows a plant cell containing different organelles that perform different functions.



- a) (i) Label the structure in the above cell in which respiration takes place. (01mark)  
(iii) How is energy useful in the body. (02marks)

- b) Respiration is divided into two types i.e. aerobic respiration that requires oxygen and anaerobic respiration that does not require oxygen. Explain why most organisms use aerobic respiration. (01mark)

- c) (i) During vigorous exercise such as athletics, certain individuals faint during or after a race. Explain this phenomenon. (01mark)

- (ii) Which first aid do you give to a person who has fainted. (01mark)

- d) State the importance of studying about anaerobic respiration in our communities. (02mks)



4. a) In the class, you have a friend who is big in size but you want to know her BMI such that you can determine her health status.

(i) What quantities do you need to calculate her BMI, state their units? (02marks)

(ii) On measuring your friend, you realize that she is 60kg heavy and 120cm. calculate the BMI of your friend. (02marks)

(iii) Comment on the health status of your friend. (01mark)

(iv) Which advise do you give her. (01mark)

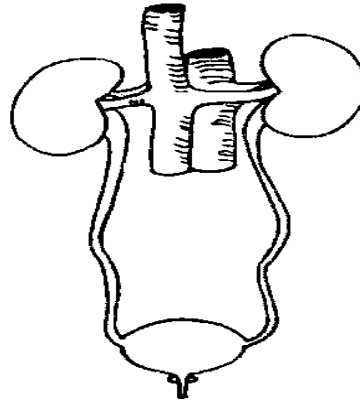
b) We have always seen different people who appear like the one in the picture below having employment opportunities such muscle building and in wrestling. These people use some drugs so as to gain such body shapes and energy as well. Use the picture below to answer questions that follow.



(i) Name the chemical substance this person uses to obtain such a body structure. (01mk)

(ii) State the long term effects of such drugs to the body. (01mark)

5. There are very many systems in the body of organisms that help in the proper functioning of the body. One of the systems in man is shown in the figure below. Use this picture to answer questions that follow.



- a) (i) Identify the above system. (01mark)

- (ii) Mention the functions of the above system in the body. (01mark)

- b) Name the structure that is normally shared by the above system and the reproductive system. (01mark)

- c) Name any other one structure of the body that have a similar function as the above system. Name their excretory substances. (02marks)

- d) Why do you think sweating is important to the body? (02marks)

## SECTION B: (60MARKS)

*Attempt only four questions from this section.*

6. Organisms require gases to run some processes. For animals, they require oxygen which is usually obtained from their environment. Man uses the respiratory system to take in this air that contains the oxygen needed from the atmosphere. Through answering the questions below, you will be to learn more about the process of breathing and gas exchange.

- a) Mention any four organs that make up the respiratory system of man. (04marks)
- b) (i) From the organs mentioned above, state the exact organ or structures through which gases are exchanged. (01mark)
- (ii) What is the difference between the function of the nose and lungs (02marks)
- (iii) What do plants use for breathing? (01mark)
- c) During breathing, the following processes occur in the body so as air can enter man.

**The volume of the chest increases.**

**Air reach in oxygen enters through the nose and travels to the lungs.**

**Intercostal muscles of the rib cage contract.**

**Pressure of the chest decreases below atmospheric pressure.**

**The rib cage moves upwards and outwards.**

The above process is not in its order, you are required to sort and organize the above process in its normal flow for breathing to occur. (05marks)

- d) Explain why breathing is very important to animals. (02marks)

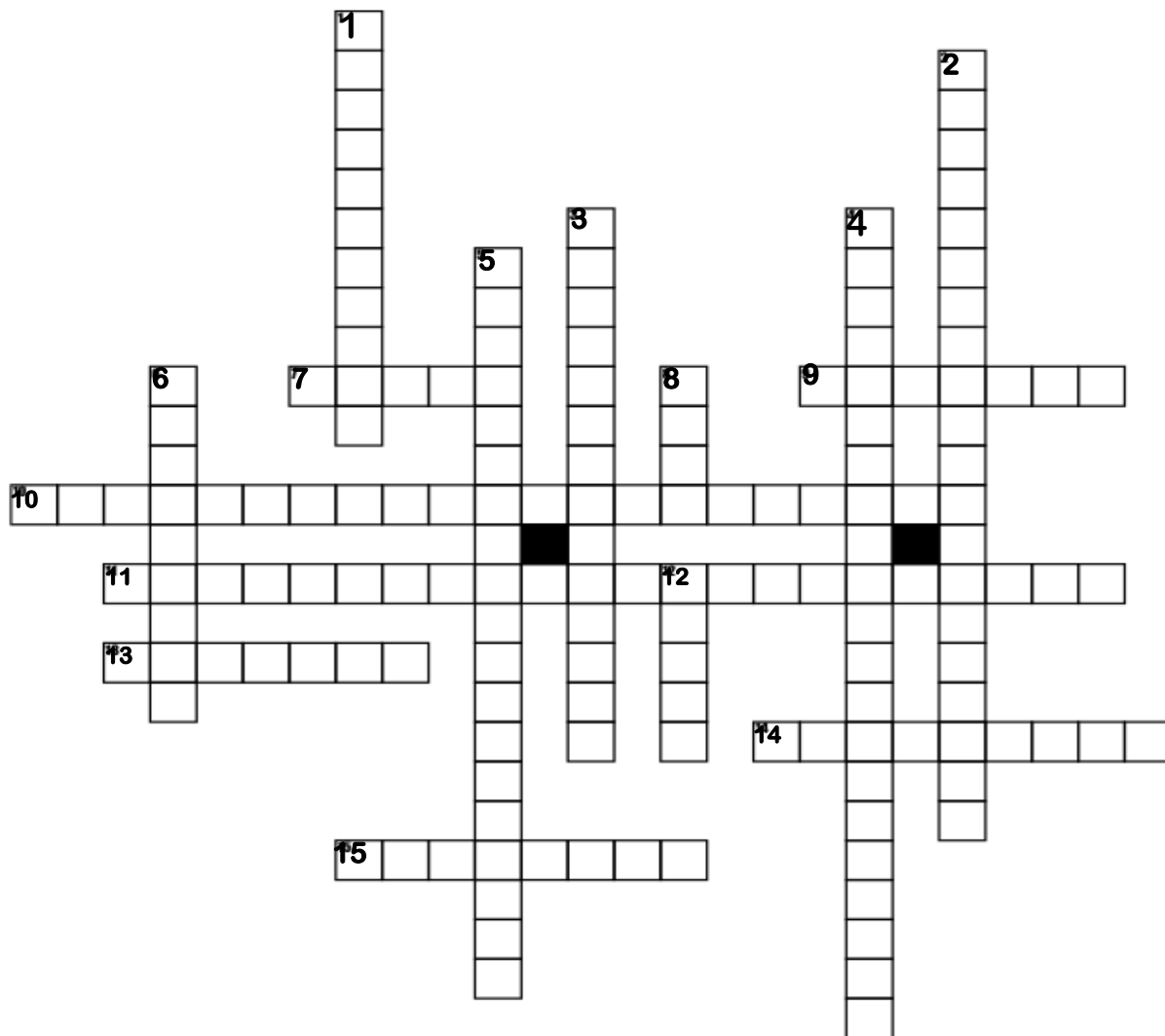
7. Through nutrition, organisms obtain their nutrients required to maintain their survival. However, different organisms have different ways of obtaining food from their environment. Some organisms like plants make their own from simple materials. While others like animals and fungi feed on already made food compounds from plants or other animals. Test your mind whether understood the concepts of nutrition in organisms. Obtain suitable words that fit across and down the boxes of the puzzle. Use these words to fill up the puzzle below. (15marks)

#### Across

7. Slimy green organisms in ponds or in other stagnant water that can make their own food.
9. A chlorophyll containing partner which is an algae and a fungus live together.
10. The mode of nutrition in which organisms ta in nutrients in solution form from dead and decaying matter.
11. The mode of nutrition in which organisms ta in ready made food.
13. Tiny pores present under surface of leaves.
14. The mode of taking food by an organism and its utilization by the body.
15. It deprives the host of the plant and takes in valuable nutrients.

#### Down

1. The green pigment that helps the leaves in photosynthesis.
2. The mode of nutrition in which organisms make food themselves.
3. The synthesis of food that occurs in the presence of sunlight.
4. Organisms live together and share shelter and nutrients.
5. The plants which eat insects.
6. The components of food that are necessary for our body.
8. The plant on which a parasite climbs.
12. The bodies of living organisms that are made of tiny units.



8. Mrs. Aketch is a good farmer who uses the knowledge she obtained from studying transport in plants to grow tomatoes for her home consumption as source and at times making juice. In the process of growing tomatoes, she prepares a nursery bed for growing the tomatoes to a certain stage but later transplants them in the late evening hours to the main garden.
- Why do you think Mrs. Aketch transplants her seedlings in the late evening? (02mks)
    - After transplanting the seedlings, Mrs. Aketch keeps on watering the main garden until a certain stage. Explain why she waters the garden. (02marks)
  - Which process do you think plants use to take up the water Mrs. Aketch provides to them? (01mark)
    - Name the cells that enable these tomatoes to absorb water. (01mark)
    - Which cells do these tomatoes use to transport water and mineral salts from roots to leaves such that they can use the water. (01mark)
  - How is the process stated in b) (i) above useful in animals? (03marks)
  - Explain what makes water to enter the roots of the plant. (02marks)
    - How do you think roots are adapted to absorb water from the soil solution? (03marks)



9. At breakfast, your school provides milk and cooked cassava to its students.
- a) Name the food nutrients that the school mess provides to its students at breakfast. (2mks)
  - b) Some students after eating this kind of food, they complain of over dosing and end up missing lessons due to sleeping in class. Explain why do students dose after having some meals. (02marks)
  - c) (i) State all the enzymes in the body that enables the learners to breakdown the food substances they are provided at breakfast. (03marks)  
(ii) Name the end products of the foods they get at breakfast. (02marks)  
(iii) How is glucose used in the body of organisms? (03marks)
  - d) After digestion, the products mentioned above are absorbed in to blood system by the ileum and the colon. State three ways in which the ileum is modified to absorb these materials. (03marks)
10. Read the passage below and use it to answer questions that follow.

### Immunity

Your immune system is what protects you when germs try to invade and attack on your body which can cause you to become sick. Your body has microscopic warriors that fight invasive germs and help your body get rid of them. Your body is pretty good at defending you against the jams. Your body systems are your first line of defense against germs. For instance, the skin tries to stop germs from entering the body, the lungs, saliva and the digestive system all try to trap germs to destroy them or to help them exit your body. Your blood also tries to destroy harmful germs. Think about when you sneeze your body is trying to get rid of something that got into your nose!! If this first line of defense does not work, there is also a second line of defense that helps fight harmful germs in order to keep you healthy.

Your second line of defense is when your body makes antibodies that help kill or destroy harmful disease or illnesses causing germs. These antibodies that your body creates are actually proteins that go on the attack when your body gets harmful germs that are not supposed to be a part of bodies of your body. Think about when you get a cold or a flu. Your body works hard making antibodies that will destroy the cold or flu germs, when they are successful you begin to feel better. Vaccinations act in a similar way as they contain antibodies as well. The antibodies in the vaccinations help prevent disease and illness like measles, chicken pox and specific types of flus. It is also important to live a healthy lifestyle by eating nutritiously and getting exercise daily to boost your immunity.

## Questions

- a) (i) Define immunity using your own words. (02marks)  
(ii) Describe how your body fights against germs. (02marks)
- b) (i) What would happen if you had no immunity? (01mark)  
(ii) How do vaccines assist with immunity? (01mark)
- c) Describe how the following help in immunity.  
(i) Mucus (01mark)  
(ii) White blood cells (02marks)  
(iii) Sneezing (01mark)
- d) State how the following acquire their immunity:  
(i) Embryos (01mark)  
(ii) Babies. (01mark)
- e) Explain how immunization or vaccination provided immunity of the body. (03marks)

11. a) Mr. Osinde bought land which was being used by the person from whom he bought the land. Mr. Osinde decided to plant maize crops for his family but he observed the following features on leaves in his plantation after planting.

- **Stunted growth**
- **Yellowing of leaves**
- **Poor root and fruit development**
- **Premature death of plant parts.**

- (i) Which mineral elements do you think were deficient in the soil? (02marks)  
(ii) Which advice can you give to Mr. Osinde about deficient elements? (02marks)  
(iii) Name the farming practices the former land owner could have used that might have caused to the exhaustion of these particular elements. (02marks)

b) When he realized that, Mr. Osinde decided to also determine the soil air content. In the investigation, he obtained the following results though he faces challenges with calculations involved in soil:

**Volume of soil** =  $30\text{cm}^3$   
**Volume of soil and water before mixing** =  $70\text{cm}^3$   
**Volume of soil and water after mixing** =  $75\text{cm}^3$

- (i) Help Mr. Osinde to determine the percentage of air in his soil. (03marks)  
(ii) Comment on the aeration of Mr. Osinde's soil. (01mark)  
(iii) Which advice can you give him to improve on the aeration of the soil? (03marks)
- c) What is the usefulness of a better soil aeration to the plants? (02marks)

END