

THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA
FORM TWO NATIONAL ASSESSMENT

033

BIOLOGY

Time: 2:30 Hours

ANSWERS

YEAR: 2023

Instructions

1. This paper consists of sections A, B and C with a total of **ten (10)** questions.
2. Answer **all** questions in the spaces provided.
3. Section A and C carry **fifteen (15)** marks each and section B carries **seventy (70)** mark s.
4. All writings must be in **blue** or **black** ink.
5. Communication devices and any unauthorized materials are **not** allowed in the assessment room.
6. Write your **Assessment Number** at the top right hand corner of every page.

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Section A (15 Marks)

i. Which branch of biology deals with the study of plants?

- A. Botany
- B. Taxonomy
- C. Zoology
- D. Ecology

Answer: A. Botany

Botany is the branch of biology focused on the study of plants.

ii. A teacher sprayed a perfume in one corner of the classroom and after 10 minutes the entire classroom was filled with the smell of the perfume. Which process was demonstrated by the teacher?

- A. Osmosis
- B. Diffusion
- C. Transpiration
- D. Mass flow

Answer: B. Diffusion

Diffusion is the movement of particles from a region of higher concentration to a region of lower concentration, as demonstrated in the spreading of the perfume.

iii. Farmers in Naiva village complain of passing blood-stained urine and faeces. Which disease is likely affecting them?

- A. Gonorrhoea
- B. Cholera
- C. Bilharzia
- D. Malaria

Answer: C. Bilharzia

Blood-stained urine and faeces are symptoms of Bilharzia, a disease caused by parasitic worms.

iv. A mother went to a hospital with her baby complaining of the baby's high body temperature. Which instrument will be used to examine the baby?

- A. Beam balance
- B. Stopwatch
- C. Stethoscope
- D. Thermometer

Answer: D. Thermometer

A thermometer is used to measure body temperature accurately.

v. What happens during the process of taking air into the lungs of a human being?

- A. Air is pushed out of the lungs
- B. The ribcage moves inwards
- C. The diaphragm contracts
- D. The diaphragm relaxes

Answer: C. The diaphragm contracts

During inhalation, the diaphragm contracts and moves downward, allowing the lungs to expand.

vi. Why is chlorophyll necessary for photosynthesis?

- A. Splits water molecules
- B. Absorbs sunlight energy
- C. Transports water and minerals
- D. Manufactures carbohydrates

Answer B. Absorbs sunlight energy

Chlorophyll captures sunlight, which is essential for converting it into chemical energy during photosynthesis.

vii. Which of the following characteristics applies to members of the kingdom Plantae?

- A. They feed on dead and decaying organic matter
- B. They have a cell wall made up of chitin
- C. They have a membrane-bound nucleus
- D. They have a cell wall made up of cellulose

Answer: D. They have a cell wall made up of cellulose

Plant cells have a cell wall primarily composed of cellulose.

viii. Which foods will you recommend to a child suffering from kwashiorkor?

- A. Milk, groundnuts, beans, and meat
- B. Milk, cassava, sorghum, and wheat
- C. Cabbage, spinach, cassava, and eggs
- D. Sorghum, cassava, rice, and yams

Answer: A. Milk, groundnuts, beans, and meat

These foods are rich in proteins, which are essential for addressing kwashiorkor caused by protein deficiency.

ix. How do primary producers initiate energy flow in an ecosystem?

- A. Feed on herbivores and release nutrients
- B. Convert sunlight energy into chemical energy
- C. Decompose organic matter and set energy free
- D. Convert chemical energy into sunlight energy

Answer: B. Convert sunlight energy into chemical energy

Primary producers like plants use photosynthesis to convert sunlight into energy stored in chemical bonds.

2. Match the functions of the blood vessels in List A with the names of the blood vessels in List B:

List A

- i. Transports oxygenated blood from the lungs to the heart.
- ii. Carries blood containing waste materials away from the heart.
- iii. Transports deoxygenated blood from the heart to the lungs.
- iv. Transports deoxygenated blood from the lower parts of the body to the heart.
- v. Transports deoxygenated blood from the upper parts of the body to the heart.

List B

- A. Coronary artery
- B. Superior vena cava
- C. Hepatic artery
- D. Pulmonary artery
- E. Inferior vena cava
- F. Renal vein
- G. Coronary vein
- H. Pulmonary vein

Answers

- i. H (Pulmonary vein)
- ii. F (Renal vein)
- iii. D (Pulmonary artery)
- iv. E (Inferior vena cava)
- v. B (Superior vena cava)

3. Identify the communicable and non-communicable diseases from the following list:
Marasmus, Scurvy, Cholera, Tuberculosis, Pellagra, Leukaemia, Malaria, and Syphilis

Communicable diseases: Cholera, Tuberculosis, Malaria, Syphilis

Non-communicable diseases: Marasmus, Scurvy, Pellagra, Leukaemia

(b) How is each of the communicable diseases identified in (a)(i) transmitted?

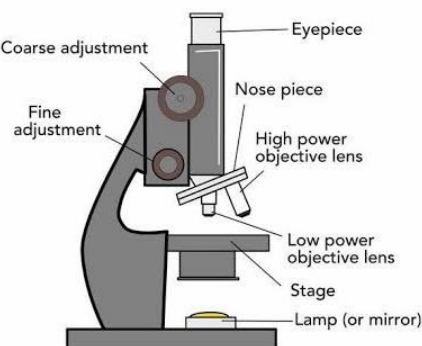
- Cholera: Transmitted through contaminated water or food.
- Tuberculosis: Transmitted through airborne droplets when an infected person coughs or sneezes.
- Malaria: Transmitted through the bite of infected female *Anopheles* mosquitoes.
- Syphilis: Transmitted through sexual contact or from mother to child during pregnancy.

4. Form Two students were asked to observe sections of plant cells using a light microscope.

(a) Why was it necessary to use such an instrument?

A light microscope magnifies small objects, allowing students to clearly observe plant cell structures such as the cell wall, nucleus, and chloroplasts.

(b) Draw a diagram of a light microscope and label the seven parts.



5.(a). How does a plant cell differ from an animal cell? Give four key points.

Plant cell

- i. Has a cell wall made of cellulose.
- ii. Contains chloroplasts for photosynthesis.
- iii. Has a large central vacuole.
- iv. Stores energy as starch.

Animal cell

- i. Lacks a cell wall.
- ii. Does not contain chloroplasts.
- iii. Has small or no vacuoles.
- iv. Stores energy as glycogen.

(b). What will happen if the cell membrane is severely damaged?

If the cell membrane is severely damaged, the cell will lose its ability to regulate substances entering and leaving. This leads to the leakage of cellular contents, resulting in cell death.

6. Your community requested you to educate them about modern methods of preserving its milk, meat, tomatoes, mangoes, and vegetables. Briefly explain four methods for preserving such products.

- i. Pasteurization: Heating milk to a specific temperature to kill harmful microorganisms, extending its shelf life.
- ii. Freezing: Storing meat, tomatoes, and mangoes at very low temperatures to prevent bacterial growth.
- iii. Canning: Sealing vegetables or fruits in airtight containers after heating to kill bacteria, preserving them for longer.
- iv. Drying: Removing moisture from vegetables and fruits to prevent microbial growth, increasing their longevity.

7. (a) Identify four components found in the First Aid kit and state the use of each one.

- Bandages. Used to cover wounds and stop bleeding.
- Antiseptic solution: Used to clean wounds and prevent infection.
- Scissors: Used for cutting bandages or clothing around injuries.
- Gloves: Used to ensure hygiene and prevent infection during first aid.

(b) Outline four procedures you will follow to give First Aid to a person with the problem of nose bleeding.

- Sit the person upright and lean them slightly forward.
- Pinch the nostrils together for 10–15 minutes.
- Apply a cold compress to the nose and cheeks.
- Avoid inserting anything into the nose and encourage the person to breathe through their mouth.

8. (a) State two phyla of the Kingdom Fungi.

- Ascomycota
- Basidiomycota

(b). Fungi are important organisms to human beings. By using four points, justify this statement.

- They are used in the production of antibiotics, such as penicillin.
- They decompose organic matter, recycling nutrients in the environment.
- Certain fungi, like yeast, are essential in baking and brewing industries.
- Some fungi, like mushrooms, are a source of food.

9. Two people have been severely injured in a car accident, leading to excessive bleeding and requiring blood transfusion.

(a). Suggest four precautions to be considered before carrying out this process.

- Determine the blood type of the donor and recipient to ensure compatibility.
- Screen the donor's blood for infectious diseases, such as HIV and Hepatitis.
- Use sterile equipment to prevent infection.
- Monitor the recipient for any adverse reactions during the transfusion.

(b). Why is blood transfusion important for these individuals?

Blood transfusion replaces lost blood, restoring the volume needed to maintain oxygen transport and circulation.

10. Caring and supporting people living with HIV/AIDS is essential for them to live healthy lives. In six points, justify this statement.

- Providing a balanced diet helps improve their immune system and overall health.
- Counseling and emotional support reduce stress and promote mental well-being.
- Ensuring regular medical checkups allows for effective management of the condition.
- Encouraging adherence to antiretroviral therapy helps suppress the virus and prolong life.
- Educating them about preventing opportunistic infections reduces health risks.
- Creating a stigma-free environment fosters social inclusion and improves their quality of life.