THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

FORM TWO NATIONAL ASSESSMENT

033 **BIOLOGY**

Time: 2:30 Hour **SOLUTIONS** **Year: 2025**

Instructions

1. This paper consists of sections A, B and C with a total of **ten (10)** questions.
2. Answer **all** questions.
3. Section A carries **fifteen (15)** marks, section B **seventy (70)** marks and section C carries **fifteen (14)** marks.
4. All writing must be in **blue** or **black** ink **except** drawing which must be in pencil.
5. Communication devices and any unauthorised materials are **not** allowed in the examination room.
6. Write your **Assessment Number** at the top right corner of every page.

SECTION A (15 Marks)

Answer all questions in this section

1. For each of the items (i) to (x) choose the correct answer from among the given alternatives and write its letter in the box provided.

   (i) Which respiratory surface is responsible for gaseous exchange in the tadpole?
   A Book lung
   B Skin
   C Gills
   D Lungs

   Correct answer: C
   Reason: Tadpoles live in water and use gills for gaseous exchange before developing lungs during metamorphosis.

   (ii) Which procedure in a scientific investigation involves a series of activities which are done to discover relationships or facts that may lead to the acceptance or rejection of a hypothesis?
   A Data interpretation
   B Problem identification
   C Data recording
   D Experimentation

   Correct answer: D
   Reason: Experimentation involves carrying out tests and activities to confirm or reject a hypothesis.

   (iii) A person suffering from meningitis shows the following pair of symptoms:
   A Stiff neck and delirium
   B Weight loss and stiff neck

C Diarrhoea and seizures

D Prolonged cough and fever

Correct answer: A

Reason: Meningitis commonly causes stiff neck, headache, fever, and mental confusion or delirium.

(iv) Why is the cell wall important to a plant cell?

A Controls activities of the cell

B Produces energy for the cell

C Protects and support the cell

D Absorbs sunlight energy

Correct answer: C

Reason: The cell wall gives shape, support, and protection to the plant cell.

(v) A Form Two student measured weight of different food substances and recorded the results as follows:

1. Maize flour 10 kg
2. A bag of beans 50 kg
3. A bag of rice 5000 g
4. Cassava flour 2000 g

Which one was the heaviest?

A 4

B 2

C 1

D 3

Correct answer: B

Reason: 50 kg is the largest mass compared to 10 kg, 5 kg, and 2 kg.

(vi) How would a person suffering from high blood pressure control the disorder?

A Eating food with high levels of fats

B Engaging in regular physical exercises

C Taking a high salt diet and enough fibre

D Drinking alcohol and smoking cigarette

Correct answer: B

Reason: Regular physical exercise helps reduce blood pressure and improves heart health.

(vii) Which one would you recommend to prevent dental caries disease?

A Limiting amounts of lipids and carbohydrates in the diet

B Taking antacids and eating very hot and cold foods

C Eating foods with fibres such as fruits and vegetables

D Brushing teeth regularly with recommended tooth paste

Correct answer: D

Reason: Regular brushing with recommended toothpaste removes plaque and prevents tooth decay.

(viii) The following are communicable disease:

(i) Bilharzia, malaria and tuberculosis

(ii) Tuberculosis, cholera and gonorrhoea

(iii) Common cold, HIV/AIDS and cholera

(iv) Syphilis, gonorrhoea and typhoid

Which sets of diseases are caused by bacteria?

A (iii) and (iv)

B (i) and (ii)

C (i) and (iv)

D (ii) and (iv)

Correct answer: D

Reason: Tuberculosis, cholera, gonorrhoea, syphilis, and typhoid are bacterial diseases.

(ix) How do arteries differ from veins?

A Arteries have valves at regular intervals while veins lack valves

B Arteries have thin walls while veins have thick muscular walls

C Arteries carry carbondioxide gas while veins carry oxygen gas

D Arteries have narrow lumens while veins have wide lumens

Correct answer: D

Reason: Arteries have narrow lumens and thick walls, while veins have wide lumens.

(x) Which food chain depicts the correct flow of energy in the ecosystem?

A Grasses → Bacteria → Antelope → Leopard

B Grasses → Leopard → Antelope → Bacteria

C Grasses → Antelope → Leopard → Bacteria

D Leopard → Antelope → Bacteria → Grasses

Correct answer: C

Reason: Energy flows from producers to herbivores, then carnivores, and finally decomposers.

2. Match the functions of the parts of the human digestive system in List A with the corresponding parts in List B.

   Answers:

   (i) F
   (ii) G
   (iii) H
   (iv) A
   (v) D

3. (a) Briefly explain three proper ways of waste disposal in the environment.

   Proper waste disposal methods include burning waste materials in a controlled manner, burying waste in sanitary landfills, and recycling reusable materials to reduce accumulation of waste.

   (b) Outline four effects of poor waste disposal.

   Poor waste disposal leads to

   i. spread of diseases,
   ii. pollution of water sources
   iii. bad smell in the environment
   iv. breeding of disease causing organisms.

4. (a) What was the process being investigated?

   The process being investigated was osmosis.

   (b) How is the process identified in 4(a) important to living organisms? Give four points.

(i) It helps in absorption of water by plant roots.

(ii) It maintains shape and turgidity of plant cells.

(iii) It allows movement of water across cell membranes.

(iv) It helps in regulation of water balance in living cells.

5. (a) Classify the following organisms from Kingdom to Phylum or Division level.

   (i) Moss

   Kingdom: Plantae

   Division: Bryophyta

   (ii) Yeast

   Kingdom: Fungi

   Phylum: Ascomycota

   (b) Why is classification an important process? Give three reasons.

   Classification helps to identify organisms easily, shows relationships among organisms, and makes study of living things easier and systematic.

6. Describe the mechanism of taking air into the human lungs.

   (i) The diaphragm contracts and moves downward.

   (ii) The ribs move upward and outward.

   (iii) The chest cavity volume increases.

   (iv) Air pressure inside the lungs decreases.

   (v) Air enters the lungs from outside.

7. Briefly explain five ways of transmitting Human Immunodeficiency Virus (HIV).

   HIV is transmitted through

   (i) unprotected sexual intercourse

(ii) transfusion of infected blood

(iii) sharing sharp instruments, mother to child transmission

(iv) use of contaminated needles.

8. (a) Outline four steps they will follow to prepare food solution.

(i) Peel and cut the Irish potato into small pieces.

(ii) Grind the pieces using mortar and pestle.

(iii) Add water and mix thoroughly.

(iv) Filter the mixture using a sieve to obtain solution.

(b) Experimental report to confirm presence of starch.

Food Tested: Irish potato solution

Procedure: Add iodine solution to the food solution

Observation: Blue black color appears

Inference: Starch is present

9. (b) Why are flammable, toxic, and corrosive chemicals dangerous to human beings?

(i) Flammable

They can easily catch fire and cause burns or explosions.

(ii) Toxic

They can poison the body and cause serious illness or death.

SECTION C (15 Marks)

10. In six points support the statement that bacteria are important organisms to human being.

Digestion and nutrient absorption. Certain bacteria, such as Escherichia coli in the human intestines, assist in breaking down complex food substances and synthesizing essential vitamins like vitamin K and some B vitamins, which are crucial for human health.

Food production. They play a vital role in fermenting foods and beverages such as yogurt, cheese, pickles, and sourdough bread. Lactic acid bacteria, for example, convert sugars into lactic acid, giving these foods their characteristic taste and texture.

Medicine and pharmaceutical production. They are used to produce antibiotics (e.g., Streptomyces species produce streptomycin), vaccines, and other medically important substances like insulin through genetic engineering.

Bioremediation and environmental health. Certain bacteria can break down pollutants, toxins, and waste products, cleaning up oil spills, sewage, and contaminated soil, which indirectly benefits human living conditions.

Nitrogen fixation for agriculture. Nitrogen-fixing bacteria, such as Rhizobium, convert atmospheric nitrogen into forms that plants can use to grow, supporting food production and sustaining human populations.

Scientific research and biotechnology. They serve as model organisms in genetics, molecular biology, and biotechnology studies, helping humans understand fundamental biological processes and develop new technologies.