SMZ

ZANZIBAR EXAMINATION COUNCIL

FORM THREE ENTRANCE EXAMINATION

044 **BIOLOGY**

Time: 2:30 Hours **ANSWERS** **Wednesday 3rd November2018**

Instructions

1. This paper consists of sections A, B and C.
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.

SECTION A: Multiple Choice

1. Choose the correct answer and write its letter in the table below.

i. The first step in the scientific method
A. Practicing assertiveness
B. Asking questions
C. Formulating hypothesis
D. Identifying the problems
Answer: D. Identifying the problems. This is the initial step in the scientific method.

ii. It is used to clean wounds so as to kill germs
A. Antiseptic
B. Painkiller
C. Plaster
D. Gauze
Answer: A. Antiseptic. Antiseptics are used to prevent infection in wounds.

iii. The container which contains dangerous substances that may cause death is labeled as
A. Corrosive
B. Flammable
C. Radioactive
D. Toxic
Answer: D. Toxic. Toxic substances are marked with a warning label to indicate danger.

iv. The ability of the human body to resist infections by disease-causing organisms
A. Vaccination
B. Immunity
C. Infection
D. Sterilization
Answer: B. Immunity. Immunity protects the body from infections.

v. The organism which is a decomposer
A. Grass
B. Fungi
C. Algae
D. Spirogyra
Answer: B. Fungi. Decomposers like fungi break down dead organic matter.

vi. Planting trees to replace those that have been cut
A. Desertification
B. Afforestation
C. Reafforestation

D. Deforestation
Answer: C. Reafforestation. This refers to replanting trees in deforested areas.

vii. The structure which is used for movement in Amoeba
A. Cilia
B. Pseudopodia
C. Flagellum
D. Fimbriae
Answer: B. Pseudopodia. Amoeba moves by extending its pseudopodia.

viii. A type of malnutrition which is caused by protein deficiency
A. Rickets
B. Marasmus
C. Constipation
D. Kwashiorkor
Answer: D. Kwashiorkor. This condition is caused by severe protein deficiency.

ix. Part of the leaf which maximizes absorption of sunlight and carbon dioxide
A. Lamina
B. Midrib
C. Petiole
D. Apex
Answer: A. Lamina. The lamina is broad to capture sunlight and allow gas exchange.

x. The organ for gaseous exchange in fish
A. Lung
B. Trachea
C. Skin
D. Gills
Answer: D. Gills. Gills are specialized organs for oxygen and carbon dioxide exchange in water.

2. Match the items from LIST A with the response in LIST B.

LIST A
i. A basic principle of waste disposal
ii. Materials that are no longer needed
iii. Home garbage, used plastic bottles, broken glasses
iv. Equipment used in burning waste materials
v. Handling containers used so as to reduce waste
vi. A toilet made by digging a hole in the ground
vii. Old clothes, old furniture, leftover food, and sewage

viii. Wastes that can be decomposed by bacteria
ix. Medical wastes that can transmit infections and diseases
x. Regular collection of wastes by trucks to the dumping sites

LIST B
A. Solid wastes
B. Landfill
C. Incinerator
D. Pit latrine
E. Wastes
F. Woven bags
G. Recycling
H. Gaseous wastes
I. Incubator
J. Plastic bags
K. Household wastes
L. Biodegradable
M. Tipping
N. Compost heaps
O. Biohazards
P. Tissue paper

ANS:

i	ii	iii	iv	v	vi	vii	viii	ix	x
G	E	K	C	F	D	K	L	O	M

3. Read the sentences below very carefully, and then fill the blank spaces. Use one word for each space.
a. In 1665, Robert Hooke designed a _____.
Answer: Microscope. Robert Hooke invented the microscope to observe tiny structures.

b. The two basic types of cells are _____ and _____.
Answer: Prokaryotic, eukaryotic. Prokaryotic cells lack a nucleus, while eukaryotic cells have one.

c. The cell organelles are suspended in the _____.
Answer: Cytoplasm. The cytoplasm holds organelles in a jelly-like substance.

d. The nucleus is made of a fluid called _____.
Answer: Nucleoplasm. This fluid contains chromosomes and nucleoli.

e. Smooth endoplasmic reticulum is the site for the manufacture of _____.
Answer: Lipids. Smooth ER synthesizes lipids for cell use.

f. The inner folds of mitochondria are called _____ and these are the sites of
Answer: Cristae, respiration. Cristae increase surface area for energy production.

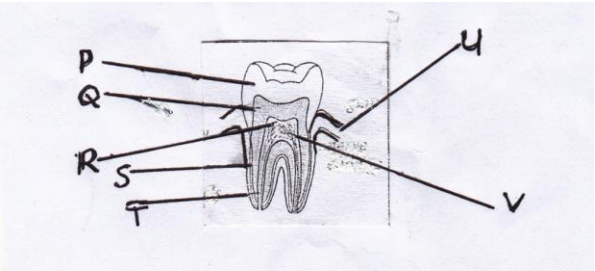
g. The green pigment in plants is _____. It is found in the cell organelle called
Answer: Chlorophyll, chloroplast. Chlorophyll captures light for photosynthesis.

4. a. List down any three disorders of the digestive system.
i. Ulcers: These are open sores in the lining of the stomach or small intestine caused by excess acid or infections.
ii. Constipation: Difficulty in passing stool due to lack of dietary fiber or dehydration.
iii. Diarrhea: Frequent loose or watery stool caused by infections or poor hygiene.

b. Write any three differences between the human digestive system and the ruminant digestive system.

Human Digestive System	**Ruminant Digestive System**
i. One stomach compartment	i. Four stomach compartments (rumen, reticulum, omasum, abomasum)
ii. Cannot digest cellulose	ii. Can digest cellulose with the help of microorganisms.
iii. Food is not regurgitated	iii. Food is regurgitated for further chewing (chewing cud).

c. i. Label the parts shown on the cross-section of the tooth of a human being.



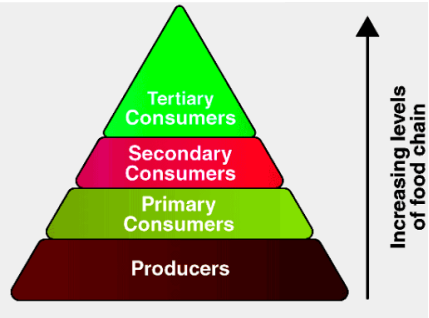
P: Enamel
Q: Dentine
R: Pulp cavity
S: Gum
T: Cement
U: Periodontal ligament
V: Jawbone

ii. Identify the type of tooth above.
Answer: Molar. Molars are used for grinding and chewing food.

5. a). Mention two ways in which food nutrients and energy flow within organisms.
i. Through the food chain, where energy is transferred from producers to consumers.
ii. Through the food web, which shows interconnected feeding relationships.

b. Show diagrammatically the representation of the different trophic levels.

(A diagram would be drawn here with levels: producers → primary consumers → secondary consumers → tertiary consumers → decomposers.)



c. State two forms of the close association between organisms in symbiosis.
i. Mutualism: Both organisms benefit, such as bees pollinating flowers.
ii. Parasitism: One organism benefits at the expense of the other, such as tapeworms in the intestines.

d. Contrast between predation and competition.
Predation: One organism (predator) hunts and kills another (prey) for food.
Competition: Organisms compete for the same resource, such as food, water, or shelter, which limits availability.

6. a. Define blood transfusion.
Answer: Blood transfusion is the process of transferring blood or blood products from one person (donor) to another (recipient) to restore lost blood or treat certain conditions.

b. List any two precautions taken during blood transfusion.
i. Blood must be screened for diseases such as HIV or hepatitis.
ii. The donor's and recipient's blood groups must be compatible.

c. Mention any two reasons for a patient to have a blood transfusion.
i. Severe blood loss due to injury or surgery.
ii. Anemia caused by conditions like sickle cell disease or bone marrow failure.
d. In a table below, put a tick (√) where the blood is compatible and a star (*) where the blood is incompatible to the donor and recipient.

Donor's Blood Group	**Recipient's Blood Group**			
	A	**AB**	**O**	
A	√	√	*	
AB	*	√	*	
O	√	√	√	

7. a. i. Mention any four items that are found in the first aid kit.
- Bandages
- Antiseptic
- Scissors
- Plaster
ii. State the use of each item mentioned above.
- Bandages: Used to cover wounds and stop bleeding.
- Antiseptic: Used to clean wounds and prevent infections.
- Scissors: Used to cut bandages or clothing during emergencies.
- Plaster: Used to protect small cuts and scrapes.

b. Study the list of the following insects: mosquitoes, bees, tsetse flies, wasps, hornets, ants.
i. Identify the stinging insects.
Answer: Bees, wasps, hornets, ants.
ii. Identify the biting insects.
Answer: Mosquitoes, tsetse flies.

c. When you were playing football, your friend fell down and had a bruise on his arm. Outline three steps on how to give him first aid.
i. Clean the wound with antiseptic to remove dirt and germs.
ii. Cover the wound with a sterile bandage to protect it.
iii. Apply gentle pressure if bleeding to stop further blood loss.

8. a. Draw the labeled basic structure of a bacterium.
A labeled diagram would include features like cell wall, cell membrane, cytoplasm, DNA, ribosomes, and flagellum.

b. Name the structure that is used for:
i. Movement: Flagellum.
ii. Attachment: Pili.

c. Name the kingdom whereby the bacteria belong.
Answer: Monera.

d. i. Mention the bacteria that cause cholera.
Answer: Vibrio cholerae.
ii. What is the shape of the bacteria causing cholera?
Answer: Comma-shaped (vibrio).
iii. What is the name of the scientific study of bacteria?
Answer: Bacteriology.

9. a. The diagram below shows the process of anaerobic respiration in yeast. Study it then answer the questions.

i. Point out the use of oil in the experiment in the test tube number 1.
Answer: To prevent oxygen from entering the solution, ensuring anaerobic conditions.

ii. Predict what will happen to the lime water at the end of the experiment in the test tube number 2.
Answer: The lime water will turn milky due to the production of carbon dioxide.

iii. The process of anaerobic respiration in plants is also called _____.
Answer: Fermentation.

iv. Write the word equation showing what happens in the test tube number 1.
Answer: Glucose → Ethanol + Carbon dioxide + Energy.

v. An anaerobic respiration in animals occurs during _____.
Answer: Strenuous exercise.

vi. The compound formed during anaerobic respiration in animals is _____.
Answer: Lactic acid.

vii. Write the word equation that represents the anaerobic respiration in animals.
Answer: Glucose → Lactic acid + Energy.

b. In the process of osmosis, a solution which has the:

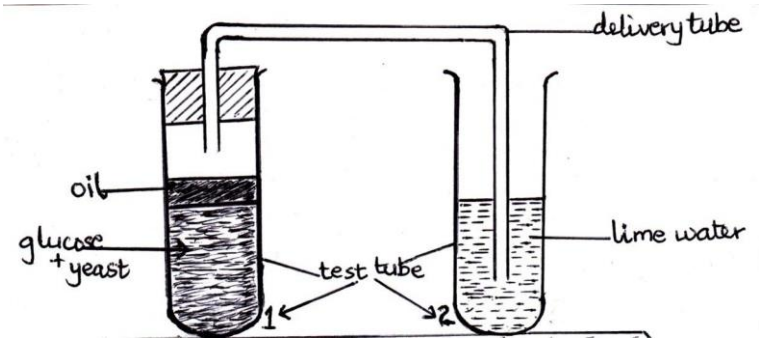
i. Greater volume of water and a lesser quantity of solute is said to be _____.
Answer: Hypotonic.

ii. Lower volume of water and greater quantity of solute is said to be _____.
Answer: Hypertonic.

iii. Same potential is said to be _____.
Answer: Isotonic.

iv. The diagram below shows the demonstration of the process of osmosis using the Visking tubing. Label the letters in the apparatus as shown.
C: Visking tubing
D: Sugar solution
E: Beaker
F: Water

v. Compare the levels of solutions A and B in Fig Q1 and in Fig Q2.
In Fig Q1 the level of solution A is higher, and in Fig Q2 the level of solution A decreases.
In Fig Q1 the level of solution B is lower, and in Fig Q2 the level of solution B increases.



vi. The function of the labeled item F is _____.
Answer: Acts as a surrounding medium that facilitates osmosis.

10. a. Name any two types of water-borne diseases.
Answer: Cholera, Typhoid.

b. Tuberculosis is an air-borne communicable disease. Write a short essay about it, using the following subheadings:

The cause and the transmission of the disease
Tuberculosis is caused by the bacterium *Mycobacterium tuberculosis*. It is transmitted through airborne droplets when an infected person coughs, sneezes, or talks.

The signs or symptoms of the disease
Symptoms include persistent cough, chest pain, weight loss, fever, night sweats, and fatigue.

The effects of the disease
If untreated, tuberculosis can damage the lungs and other organs, leading to respiratory failure and death. It also reduces a person's productivity and quality of life.

Prevention and treatment of the disease
Tuberculosis can be prevented through vaccination (BCG vaccine), avoiding close contact with infected individuals, and maintaining good hygiene. Treatment involves a prolonged course of antibiotics such as rifampin and isoniazid.

11. Ecosystem and Environmental Components

a. Define ecosystem.
Answer: An ecosystem is a community of living organisms interacting with each other and their non-living environment in a specific area.

b. Write a short description on:

i. Biotic component of the environment and their characteristics.
Biotic components are the living parts of the environment, including plants, animals, and microorganisms. They interact with each other through processes like predation, competition, and symbiosis.

ii. Abiotic component of the environment and their characteristics.
Abiotic components are the non-living parts of the environment, such as sunlight, water, air, soil, and temperature. These factors influence the survival and distribution of organisms in an ecosystem.