SMZ

ZANZIBAR EXAMINATION COUNCIL

FORM THREE ENTRANCE EXAMINATION

044 **BIOLOGY**

Time: 2:30 Hours **ANSWERS** **Wednesday 3rd November2021**

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

i. A person with blood group O has antibodies of
A. a
B. a and b
C. b and o
D. b

Answer: B. A person with blood group O has antibodies against both A and B antigens, which makes it incompatible with blood groups A, B, and AB for receiving blood.

ii. The natural unit composed of living and non-living things interacting together.
A. Community
B. Ecology
C. Ecosystem
D. Habitat

Answer: C. An ecosystem includes biotic (living) and abiotic (non-living) factors that interact in a specific environment.

iii. It is trapped by chlorophyll during photosynthesis.
A. Carbon dioxide
B. Light
C. Carbohydrates
D. Water
Answer: B. Chlorophyll captures light energy during photosynthesis to convert it into chemical energy.

iv. The object to be observed under the microscope is placed on
A. Body tube
B. Mirror
C. Objective lens
D. Stage
Answer: D. The stage is the flat platform where the slide containing the specimen is placed for observation.

v. The protozoa with both animal and plant characteristics
A. Amoeba
B. Euglena
C. Paramecium
D. Plasmodium
Answer: B. Euglena has plant-like characteristics (photosynthesis) and animal-like movement (flagella).

vi. A special room designed for scientific experiments
A. Classroom
B. Staff room
C. Laboratory
D. Library
Answer: C. Laboratories are specifically designed for conducting scientific experiments.

vii. The fundamental unit of life
A. Cell
B. Organ
C. System
D. Tissue

Answer: A. The cell is the basic structural and functional unit of all living organisms.

viii. The end product of lipid digestion is
A. Amino acid
B. Fatty acid and glycerol
C. Glucose
D. Peptide
Answer: B. Lipids are broken down into fatty acids and glycerol during digestion.

ix. The type of immunity a child gets from the mother during pregnancy is
A. Artificial active
B. Artificial passive
C. Natural active
D. Natural passive
Answer: D. Natural passive immunity is acquired through antibodies passed from the mother to the fetus via the placenta.

x. Which of the following mammalian blood vessels contains oxygenated blood at low pressure?
A. Aorta
B. Pulmonary artery
C. Pulmonary vein
D. Vena cava
Answer: C. The pulmonary vein carries oxygenated blood from the lungs to the heart at low pressure.

2. Match the items from **LIST A** with the response in **LIST B** related to cell structure by writing its correct letter in the table below.

List A:

i. The organelles in the cell which is concerned with respiration.
ii. The oval organelles that contain the green pigment in plants.
iii. It is surrounded by a tonoplast membrane.
iv. Has a tail which enables it to swim to the egg.
v. Can change their shapes so as to engulf and destroy harmful microorganisms.
vi. Is made up of non-living materials called cellulose.
vii. A group of cells which perform the same function.
viii. Collection of different tissues working together to perform a certain function.
ix. They contain hemoglobin in which oxygen attaches during transportation.
x. They absorb water and minerals from the soil.

List B:

A. Sperm cell
B. Mitochondria
C. Tissue
D. Guard cell
E. Root hair cells
F. Organ
G. Involuntary muscle
H. Pericardium
I. Red blood cell
J. Cell sap vacuoles
K. Cell wall
L. Chloroplast
M. White blood cell

i	ii	iii	iv	v	vi	vii	viii	ix	x
B	L	J	A	M	K	C	F	I	E

3. Read the sentences below very carefully, then fill the blank spaces. Use one word for each space.

a. Apparatus used for scooping powder or crystalline substances is _____.

Answer: Spatula

b. The process by which water evaporates from the plant through the stomata in the leaves is called _____.

Answer: Transpiration

c. Reducing, _____ and _____ are basic principles of waste disposal.

Answer: Reusing, Recycling

d. Muscles that are found between the ribs are called _____ muscles.

Answer: Intercostal

e. Protein in the diet is needed for growth and body _____.

Answer: Repair

f. The leaves of _____ plant close when they are touched.

Answer: Mimosa

g. In classification _____ is the highest rank order.

Answer: Kingdom

h. The study of _____ is known as mycology.

Answer: Fungi

i. Inadequate amount of fiber in the diet lead to _____.

Answer: Constipation

4. The Figure 1 below represents a transverse section of a young plant body part.

i. Label the parts numbered A - F.

A: Epidermis

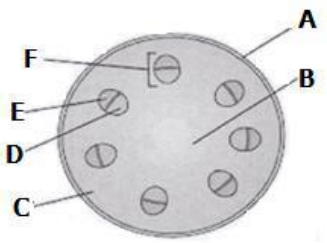
B: Cortex

C: Phloem

D: Xylem

E: Cambium

F: Pith



ii. What part of the plant body does the diagram represent?

Answer: Stem

iii. Does the diagram represent a monocot or dicot?

Answer: Dicot

iv. Give two reasons for your answer in (iii) above.

- The vascular bundles are arranged in a ring.
- The presence of cambium indicates secondary growth potential.

5. Gastric hormone stimulates the production of gastric juice from the gastric glands.

a. List three components of gastric juice of man and state the function of each.

i. Component: Hydrochloric acid

Function: Provides an acidic environment for enzymes to work and kills pathogens.

ii. Component: Pepsin

Function: Breaks down proteins into peptides.

iii. Component: Mucus

Function: Protects the stomach lining from digestive acids and enzymes.

b. Complete the table by filling the blank column.

Region of Human Alimentary Canal	**Protein-Digesting Enzyme(s)**
Stomach	Pepsin
Duodenum	Trypsin
Ileum	Erapsin

6. (a). Read the following equation carefully and then answer the questions.

$$6CO_2 + 12H_2O \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} C_6H_{12}O_6 + 6H_2O + 6O_2$$

i. Write the equation in words.
Answer: Carbon dioxide and water, in the presence of sunlight and chlorophyll, produce glucose, water, and oxygen.

ii. Name the process which is represented by the equation above.
Answer: Photosynthesis

b. Write an example of the following underground storage organ.

i. Corm
Answer: Crocus

ii. Rhizome
Answer: Ginger

c. List two deficiency signs of potassium for plants.
- Yellowing of leaf margins.
- Weak stems and stunted growth.

d. The other name for blue economy is marine economy. Write three blue economy's priority areas in Zanzibar.
- Sustainable fishing.
- Marine tourism.
- Aquaculture development.

7. (a) Define the following terms:

i. Personal hygiene
Answer: Personal hygiene refers to practices of maintaining cleanliness and grooming of the body to preserve health.

ii. Good manners
Answer: Good manners are behaviors and habits that are socially accepted as polite and respectful.

b). Write three importance of personal hygiene and good manners.
i. Prevents the spread of diseases.
ii. Promotes social acceptance.
iii. Improves self-confidence and mental health.

c). During puberty boys develop secondary sexual characteristics which are different from that of girls. Outline five changes that occur in boys at puberty.
i. Deepening of the voice.
ii. Growth of facial and body hair.
iii. Enlargement of the testes and penis.
iv. Increased muscle mass.
v. Production of sperm cells.

8. (a). Complete the table below by filling the correct answer.

Deficiency of Nutrient in Diet	**Disorder**
Vitamin C	Scurvy
Vitamin A	Night blindness
Iodine	Goiter
Vitamin D	Rickets

b). Differentiate between saprophytism and symbiosis.

Saprophytism: A relationship where an organism feeds on dead organic matter.
Symbiosis: A mutually beneficial relationship between two living organisms.

c). List four functions of lipids in the body.

i. Energy storage.
ii. Insulation to maintain body temperature.
iii. Protection of vital organs.
iv. Formation of cell membranes.

9. (a). A certain experiment was conducted and the arrangement of apparatus for the experiment is as shown below.

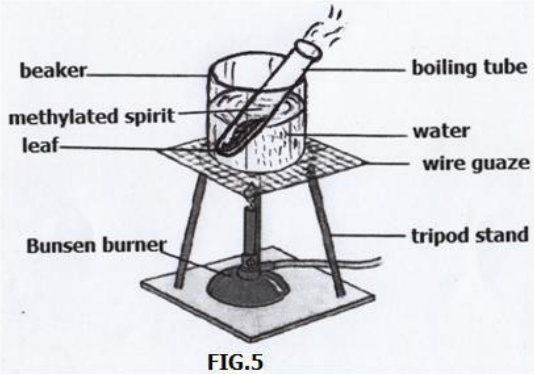


FIG.5

i. Write the aim of this experiment.
Answer: To demonstrate that chlorophyll is necessary for photosynthesis.

ii. Why was the leaf dipped in hot water for 30 seconds?
Answer: To kill the cells and stop any ongoing metabolic processes in the leaf.

iii. Give reason why the leaf was boiled in methylated spirit.
Answer: To remove chlorophyll, making it easier to observe the iodine test for starch.

iv. Explain why the leaf was dipped in hot water once again.
Answer: To soften the leaf after being brittle from boiling in methylated spirit.

(b). You are given the following basic food substances: meat, rice, peas, castor seeds, bread, and margarine.

i. Classify them as protein, lipids, or carbohydrates and write them in the table below.

Proteins	**Lipids**	**Carbohydrates**
Meat	Castor seeds	Rice
Peas	Margarine	Bread

ii. Write the color(s) of the following reagents.

Reagents	**Color of Reagents**
Sodium hydroxide	Colorless
Iodine solution	Yellow-brown
Benedict's solution	Blue
Sudan III solution	Red
Copper II Sulphate	Blue

iii. Give reason why dilute hydrochloric acid is added when testing non-reducing sugar.
Answer: Dilute hydrochloric acid breaks down non-reducing sugars into monosaccharides, which can then react with Benedict's solution.

iv. Write the products when a glucose molecule and a fructose molecule combine.
Answer: Sucrose and water.

10.(a). Define the following terms:

i. Food preservation
Answer: Food preservation refers to methods used to prevent food spoilage and extend its shelf life.

ii. Food storage
Answer: Food storage refers to the proper placement of food to maintain its quality and prevent contamination or spoilage.

b. A fisherman today caught a lot of fish. Briefly explain four methods which will help him to preserve his fish when there is no electricity.

i. Salting: Applying salt to draw out moisture and inhibit bacterial growth.
ii. Drying: Exposing fish to sunlight to remove moisture.
iii. Smoking: Exposing fish to smoke to preserve and flavor the fish.
iv. Fermenting: Using controlled microbial activity to preserve fish.

11. Write an essay on the slogan "KEEP ZANZIBAR CLEAN" using the following guidelines:

KEEP ZANZIBAR CLEAN

Waste refers to any unwanted or discarded material resulting from human, animal, or industrial activities. It includes materials that are no longer useful in their current form, such as food scraps, plastic wrappers, old electronics, and industrial by-products. Managing waste properly is crucial to maintaining a clean and healthy environment.

Waste disposal is the process of safely collecting, transporting, treating, and getting rid of waste materials. Proper waste disposal ensures that harmful materials do not accumulate in the environment, posing risks to human health, animals, and ecosystems.

There are different types of waste generated by human activities. Biodegradable waste, such as food scraps and plant materials, decomposes naturally and can be converted into compost. Non-biodegradable waste, such as plastics and metals, does not decompose easily and requires recycling or specialized disposal

methods. Hazardous waste, like chemicals and medical waste, can cause harm to living organisms and the environment if not handled correctly. Electronic waste, such as old phones and computers, contains toxic materials that must be disposed of with care to avoid environmental contamination.

Reducing waste is one of the most effective ways to keep Zanzibar clean. Reusing materials helps extend the lifespan of items, reducing the need to produce new products. Recycling waste, such as turning plastic into new products or paper into pulp, reduces the amount of waste sent to landfills. Composting organic waste like food scraps and yard waste converts it into nutrient-rich material that can be used to enrich soil. Avoiding single-use plastics, such as plastic bags and straws, minimizes waste accumulation in the environment. Donating items that are still in good condition, such as clothes or furniture, helps reduce waste while benefiting others.

A clean Zanzibar not only promotes a healthy and pleasant living environment but also enhances the appeal of the islands to tourists, boosting the local economy. Proper waste management practices and community awareness are key to achieving and maintaining this goal. Everyone has a role to play in keeping Zanzibar clean, from individual households to businesses and local authorities. Together, we can create a cleaner, healthier, and more sustainable environment for current and future generations.