SMZ

ZANZIBAR EXAMINATIONS COUNCIL

FORM ONE ENTRANCE EXAMINATION

129 **SCIENCE**

TIME: 2.00 HOURS **ANSWERS** **FRIDAY 29ST NOVEMBER, 2019 A.M**

INSTRUCTIONS TO CANDIDATES

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

2. Answer ALL questions in section A and B. Choose THREE (3) question in section C.

3. Write your examination number on each page.

4. Write all answers in the space provided.

5. Use a blue or black pen in writing. 6. Cellular phones and unauthorized materials are not allowed in the examination room.

FOR EXAMINER'S USE ONLY

QUESTION NUMBER	MARKS	SIGNATURE
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SECTION A:

1. Choose the correct answer from the given alternatives and put its letter in the box below the questions.

i. It is an STI infection
A: Cholera B: Malaria C: Gonorrhoea D: Cold

The correct answer is **C: Gonorrhoea**. Gonorrhoea is a sexually transmitted infection caused by bacteria. Cholera is a waterborne disease, malaria is transmitted by mosquitoes, and cold is viral.

ii. Ribs and lungs are organs in
A: Respiratory system B: Digestive system C: Nervous system D: Skeletal system

The correct answer is **A: Respiratory system**. The lungs are primary organs for breathing, and the ribs protect the lungs. The skeletal system includes bones only, digestive system includes stomach and intestines, and the nervous system includes brain and nerves.

iii. An attractive part of a flower
A: Filament B: Stalk C: Sepal D: Petal

The correct answer is **D: Petal**. Petals are often brightly colored to attract pollinators. Filament is part of the stamen, sepal protects the bud, and stalk supports the flower.

iv. A liquid has
A: Fixed shape B: High boiling point C: Changing meniscus D: Fixed volume

The correct answer is **D: Fixed volume**. Liquids have a definite volume but take the shape of the container. They do not have a fixed shape, and the meniscus is a curvature seen during measurement, not a defining property.

v. The cochlea is found in
A: Inner ear B: Outer ear C: Middle ear D: Semi circular canals

The correct answer is **A: Inner ear**. The cochlea is responsible for converting sound vibrations into nerve impulses. The outer ear collects sound, the middle ear amplifies it, and semicircular canals maintain balance.

vi. The drugs for an HIV positive person is
A: VCT B: ARV C: AIDS D: ICT

The correct answer is **B: ARV**. Antiretroviral drugs (ARV) help manage HIV infection by reducing viral load. VCT is voluntary counselling and testing, AIDS is the condition, and ICT is unrelated.

vii. Nitrogenous waste products are removed from the body by
A: Heart B: Nose C: Liver D: Kidney

The correct answer is **D: Kidney**. Kidneys filter blood to remove nitrogenous wastes like urea. The heart pumps blood, the nose is for breathing, and the liver detoxifies chemicals.

viii. The first leaf of a seed is
A: Testa B: Cotyledon C: Plumule D: Radicle

The correct answer is **B: Cotyledon**. Cotyledons store food for the growing seedling. Testa is the seed coat, plumule is the shoot, and radicle is the root.

ix. A submarine can float or sink because
A: It is lighter than water B: It is heavier than water C: It is designed to float or sink D: It can fill air or water in its tank

The correct answer is **D: It can fill air or water in its tank**. Submarines adjust buoyancy by filling tanks with air (to float) or water (to sink).

x. The role of an iris in an eye is
A: To reflect the light B: To change the size of a pupil C: To direct the light rays D: To keep the image

The correct answer is **B: To change the size of a pupil**. The iris controls how much light enters the eye by adjusting the pupil size.

2. Match the sentences in LIST A with a correct response from LIST B.

i. Blood fluid – **C: Plasma**. Plasma is the liquid component of blood that carries cells and nutrients.

ii. Omnivorous – **H: Eat grasses and meat**. Omnivores consume both plant and animal foods.

iii. Pollination – **N: Pollen to stigma**. Pollination is the transfer of pollen from anther to stigma.

iv. Electric current – **K: Ammeter**. An ammeter measures electric current.

v. V = V1 + V2 + V3 + …… – **A: Cells in series**. Voltage adds up in series circuits.

vi. Effort – **M: Pull or push**. Effort is the force applied to move an object.

vii. Photosynthesis – **B: Water, light, carbon dioxide, chlorophyll**. These are required for plants to produce food.

viii. Diptheria – **D: Sore throat and dark skin**. Diphtheria causes throat infection and sometimes skin discoloration.

ix. Convex lens – **E: Thicker at the middle**. Convex lenses converge light and are thicker in the center.

x. Rainfall formation – **G: Condensation**. Rain forms when water vapor condenses into droplets.

3. For each statement write T if the sentence is TRUE and F if the sentence is FALSE.

i. The sun is an artificial source of light – **F**. The sun is a natural source of light.

ii. Marasmus is caused by lack of protein – **T**. Marasmus results from severe protein and energy deficiency.

iii. Puberty is the change from childhood to adulthood – **T**. Puberty marks physical and hormonal changes leading to sexual maturity.

iv. The oviduct produces ova – **F**. Oviduct transports ova; ovaries produce them.

v. The process of photosynthesis takes place in the plant leaf – **T**. Chloroplasts in leaves carry out photosynthesis.

vi. The current flows only when there is a closed circuit – **T**. Electric current requires a complete path to flow.

vii. Duodenum is the first part of small intestine – **T**. Food from the stomach enters the duodenum first.

viii. Image in human eye is formed in the iris – **F**. The image forms on the retina, not the iris.

ix. Dynamite is the best method of fishing – **F**. Using dynamite is destructive and illegal.

x. Ureter transports urine from kidneys to urinary bladder – **T**. Ureters carry urine for storage in the bladder.

SECTION B:

4. Choose the correct answers from the box below and fill in the blanks.

a) The **heart** is a pumping organ of blood. It contracts to circulate blood throughout the body.

b) The blood is purified in the **kidney**. Kidneys remove nitrogenous wastes and maintain water balance.

c) A blood vessel that carries blood from the heart is **artery**. Arteries transport oxygen-rich blood to tissues.

d) A blood vessel that carries blood towards the heart is **vein**. Veins carry deoxygenated blood back to the heart.

e) The **capillaries** are the smallest blood vessels. They enable exchange of gases, nutrients, and wastes with tissues.

f) Blood in the pulmonary artery has much **carbon dioxide** and lacks **oxygen**. It carries CO_2 from the heart to the lungs for gas exchange.

g) The upper chambers of the heart are called **auricles**. They receive blood entering the heart.

h) The lower chambers of the heart are called **ventricles**. They pump blood out of the heart.

i) The adult human has an average of **72** beats per minute. This is a normal resting heart rate.

5. a) Define the terms:

i) Air – **Air is the mixture of gases surrounding the Earth, primarily nitrogen and oxygen, essential for breathing and life processes.**

ii) Combustion – **Combustion is a chemical reaction between a substance and oxygen that produces heat and light, usually seen as fire.**

b) The gas which is used in breathing in human is **oxygen**. Oxygen is inhaled to support respiration and release energy.

c) i) Fill in the amount of the composition of the given gases in air:

- Nitrogen – **78%**
- Carbon dioxide – **0.03%**
- Rare gases – **1%**

ii) The gas which is missing in the table is **oxygen (21%)**.

iii) The gas which is used to put off the fire is **carbon dioxide**. CO2 displaces oxygen, preventing combustion.

6. a) Mention the two (2) main parts of the nervous system

i) **Central nervous system (CNS)** – includes the brain and spinal cord.

ii) **Peripheral nervous system (PNS)** – includes nerves that connect CNS to the body.

b) List two (2) functions of the brain

i) **Control of body activities** – regulates voluntary and involuntary actions.

ii) **Coordination of senses** – interprets information from sensory organs and coordinates responses.

c) Draw the structure of the human brain and label **forebrain, midbrain, hindbrain, and spinal cord** – forebrain processes thinking and memory, midbrain controls reflexes, hindbrain coordinates balance and movement, spinal cord transmits messages.

7. a) What are aquatic animals?

Aquatic animals are **organisms that live in water, either freshwater or saltwater, and are adapted to swim, breathe, and feed in aquatic environments**. Examples include fish, turtles, and crabs.

b) Fill in the table for aquatic animals:

With backbone – **Turtle, Whale, Dolphin, Shark**
Without backbone – **Crab, Octopus**

c) List four (4) economic importances of aquatic animals

i) **Food source** – provide protein through fish and seafood.
ii) **Employment** – fishing supports livelihoods.
iii) **Recreation** – boating, aquaculture, and tourism.
iv) **Medical research** – some aquatic animals are used in scientific studies.

8. a) What is germination?

Germination is **the process by which a seed develops into a young plant under suitable conditions of water, oxygen, and temperature**.

b) Identify the type of germination in the following seeds:

Seeds of epigeal germination – **Bean, Maize, Pea**
Seeds of hypogeal germination – **Groundnut, Rice, Millet, Mango, Orange**

c) Difference between epigeal and hypogeal germination

Epigeal germination – **Cotyledons rise above soil**
Hypogeal germination – **Cotyledons remain below soil**

9. a) Draw the two (2) types of lenses – **Convex (thicker in the middle), Concave (thinner in the middle)**

b) Identify the part of the eye described below:

i) Made of elastic tissue, constricts or dilates – **Iris**
ii) A small dark opening in the centre of the iris muscles – **Pupil**
iii) Transparent fluid that fills the first chamber – **Aqueous humour**
iv) Transparent outer part of the eye – **Cornea**

10. a) What is pressure?

Pressure is **the force applied per unit area on a surface**. It is calculated as the amount of force acting on a given area. Pressure increases when the force is larger or the area is smaller, and it is applied in various practical applications like hydraulics, water supply systems, and fluid mechanics.

b) Based on the diagram showing the effect of height on water pressure:

i) The hole which sends the longest jet from the tank is **the lowest hole**.

ii) Reason – **Pressure in a fluid increases with depth; the deeper the hole, the higher the pressure, which forces the water out faster and farther.**

iii) The hole which sends the shortest jet from the tank is **the top hole**.

iv) Reason – **The pressure at the top is lower because it is closer to the surface of the water, resulting in a weaker and shorter jet.**

v) Outline two (2) applications of pressure in water:

- **Water supply systems:** Elevated tanks use pressure to distribute water to homes and industries.
- **Hydraulic machines:** Use water pressure to lift heavy objects or operate machinery.

vi) Why is the supplying water tank placed above the ground level?

Water tanks are placed above the ground to **create gravitational pressure**. The higher the tank, the greater the pressure, which ensures water flows easily through pipes without the need for mechanical pumping. This also allows continuous water supply even during power outages.

11. Draw the longitudinal section of a flower, on it show the following:

i) **Stigma** – the part of the pistil where pollen lands for fertilization.

ii) **Style** – the stalk that connects stigma to the ovary, allowing pollen tubes to grow downwards.

iii) **Ovary** – the enlarged base of the pistil containing ovules which develop into seeds after fertilization.

iv) **Anther** – the part of the stamen that produces pollen grains.

v) **Petal** – the colorful part that attracts pollinators.

vi) **Sepal** – the green leaf-like structure that protects the flower bud before it opens.

12. a) What is electricity?

Electricity is **the flow of electric charge (usually electrons) through a conductor**. It is a form of energy that can be used to power devices, generate heat, produce light, and operate machines. Electricity can be generated from various sources like batteries, generators, and power plants. It is essential in daily life for lighting, communication, and industrial processes.

b) Study the pictures of electrical devices below. Write the symbols used in these pictures:

A – **Voltmeter symbol** – measures potential difference between two points in a circuit.

B – **Ammeter symbol** – measures the current flowing through a circuit.

C – **Cell symbol** – represents a source of electric energy with positive and negative terminals.

D – **Switch symbol** – controls the flow of electricity by opening or closing the circuit.

13. a) Define magnet.

A magnet is **a material or object that produces a magnetic field, attracting ferromagnetic materials like iron, cobalt, and nickel**. Magnets have two poles (north and south) and exert forces on other magnets or magnetic materials.

b) Name two (2) substances that can be attracted by a magnet:

i) **Iron** – commonly attracted to magnets and used in various appliances.

ii) **Steel** – contains iron and can be magnetized.

c) State the two (2) laws of magnet:

i) **Law of poles** – opposite poles attract each other, while like poles repel each other.

ii) **Law of magnetic force** – the force between two magnetic poles is directly proportional to the product of their strengths and inversely proportional to the square of the distance between them.

d) Mention any four (4) devices that use magnet:

i) **Electric motor** – converts electrical energy into mechanical energy using magnets.

ii) **Generator** – produces electricity by rotating a coil in a magnetic field.

iii) **Compass** – uses a magnetized needle to show direction.

iv) **Loudspeaker** – uses magnets to convert electrical signals into sound waves.