SMZ

ZANZIBAR EXAMINATIONS COUNCIL

FORM ONE ENTRANCE EXAMINATION

129 **SCIENCE**

TIME: 2.00 HOURS **ANSWERS WEDNESDAY 18ST OCTOBER, 2021 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
1		
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JUMLA		

SECTION A: (30 Marks)
Answer ALL questions in this section.

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

i. It is thicker at the edge than at the middle
A. Convex lens
B. Concave lens
C. Plane mirror
D. Convex mirror

Answer: B. Concave lens
A concave lens is thinner at the middle and thicker at the edges. It diverges light rays and is used in spectacles for short-sightedness. Convex lenses are thicker at the center, not the edges.

ii. Impulses of the image from the eye to the brain are sent by
A. Olfactory nerve
B. Auditory nerve
C. Optic nerve
D. Cardiac nerve

Answer: C. Optic nerve
The optic nerve transmits visual information from the retina to the brain for interpretation. Other nerves like the olfactory nerve detect smell, and auditory nerve detects sound.

iii. The common STI disease is
A. Malaria
B. Bilharzias
C. Cholera
D. Syphilis

Answer: D. Syphilis
Syphilis is a sexually transmitted infection (STI), whereas malaria, bilharzia, and cholera are not primarily transmitted through sexual contact.

iv. Chemical substance that can supply nutrients to plants is called
A. Manure
B. Green manure
C. Fertilizer
D. Compost manure

Answer: C. Fertilizer
Fertilizers contain concentrated nutrients like nitrogen, phosphorus, and potassium that enhance plant growth. Manure and compost improve soil fertility but are less concentrated.

v. Which of the following is called direct current generator?
A. Generator
B. Dynamo
C. Motor
D. Transformer

Answer: B. Dynamo
A dynamo produces direct current (DC), while a generator may produce alternating current (AC). Motors convert electrical energy into mechanical energy.

vi. It is used to pick a piece of iron from the sand
A. Magnet
B. Voltmeter
C. Ammeter
D. Machine

Answer: A. Magnet
Magnets attract iron, making it easy to separate iron pieces from sand. Voltmeters and ammeters measure electrical quantities but do not attract metals.

vii. Examples of monocotyledon seeds are
A. Millet and beans
B. Beans and peas
C. Maize and beans
D. Rice and maize

Answer: D. Rice and maize
Rice and maize are monocots with one cotyledon in the seed. Beans and peas are dicotyledons with two cotyledons.

viii. Pollination is the process of transferring the pollen grains from
A. Anther to stigma
B. Anther to ovary
C. Anther to filament
D. Anther to ovules

Answer: A. Anther to stigma
Pollination involves moving pollen from the male anther to the female stigma of a flower for fertilization.

ix. Pinna receives the sound waves and directs them to the
A. Auditory canals
B. Oval window
C. Ear drum
D. Cochlea

Answer: A. Auditory canals
The pinna funnels sound waves into the auditory canal toward the eardrum. The cochlea is for hearing interpretation, not initial reception.

x. One of the following is a chamber of the human heart
A. Right auricle
B. Septum
C. Aorta
D. Vena cava

Answer: A. Right auricle
The right auricle (atrium) is one of the four heart chambers. The septum separates the chambers, aorta and vena cava are blood vessels.

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

LIST A
i. Sense of vision
ii. Energy transfer in solid materials
iii. Voluntary counseling
iv. Fruits and vegetables
v. White blood cells
vi. Easily forms lather with soap
vii. Anther
viii. Gulley erosion
ix. Endolymph
x. Ureter

LIST B
A. Fight against infection in the body
B. Fluid found in the cochlea
C. Hard water
D. Male gamete of the flower
E. Conduction
F. Eye
G. Duct that joins the kidney to the urinary bladder
H. Remove
I. Occur in steep slope area
J. Provided before and after HIV/AIDS testing
K. Soft water
L. Breaking
M. Stone
N. Source of vitamins
O. Stigma

Answers:
i. **F. Eye** – The eye is the organ responsible for vision.
ii. **E. Conduction** – Heat or energy transfer in solids occurs through conduction.
iii. **J. Provided before and after HIV/AIDS testing** – Voluntary counseling helps individuals make informed health decisions.
iv. **N. Source of vitamins** – Fruits and vegetables provide essential vitamins for nutrition.
v. **A. Fight against infection in the body** – White blood cells defend the body against pathogens.
vi. **K. Soft water** – Soft water lathers easily with soap due to low calcium and magnesium content.
vii. **D. Male gamete of the flower** – Anther produces pollen, the male gamete.
viii. **I. Occur in steep slope area** – Gulley erosion forms in areas with steep slopes due to water flow.
ix. **B. Fluid found in the cochlea** – Endolymph is the fluid in the cochlear canals for hearing.
x. **G. Duct that joins the kidney to the urinary bladder** – Ureter carries urine from kidneys to bladder.

3. Write TRUE if the sentence is right and FALSE if the sentence is wrong.

i. The pancreatic juice has enzymes that digest protein food into amino acid and carbohydrates into glucose. **TRUE** – Pancreatic enzymes like amylase and trypsin break down carbohydrates and proteins respectively.

ii. Ileum is short and much coiled small intestine. **FALSE** – Ileum is long and coiled, not short.

iii. The sun is an artificial source of light. **FALSE** – The sun is a natural source of light.

iv. Virtual image cannot be formed on a screen. **TRUE** – Virtual images, like those in a plane mirror, cannot be projected on a screen.

v. Herpes simplex virus causes genital herpes. **TRUE** – HSV-2 is responsible for genital herpes infections.

vi. Two terminals of a cell are positive and negative. **TRUE** – A cell or battery has a positive and negative terminal to create a potential difference.

vii. Magnetic materials cannot be attracted by magnet. **FALSE** – Magnetic materials like iron, cobalt, and nickel are attracted to magnets.

viii. Presence of air spaces in a body helps it to float in water. **TRUE** – Air spaces reduce density, making objects buoyant.

ix. Endocarp is a part of fruit which cover the seed. **TRUE** – Endocarp is the innermost layer surrounding the seed.

x. Peas and ground nuts are fleshy fruits. **FALSE** – They are dry fruits, not fleshy fruits.

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

a) Temperature is the degree of **hotness** or **coldness** of the body.
Temperature measures how hot or cold a body is compared to a reference.

b) The inability of a person to bear **children** is called **sterility**.
Sterility is the biological inability to reproduce offspring.

c) The common herbivorous aquatic animals are **tilapia** and **sardines**.
These fish feed on plants or plankton in freshwater and marine ecosystems.

d) Water vapour in the atmosphere is the result of **evaporation** and **condensation**.
Evaporation converts liquid water to vapor, and condensation forms clouds and rain.

e) Material that allows electricity to pass through is called **conductor**, while material that controls the size of current flowing in a circuit is known as **resistor**.
Conductors allow electric flow; resistors limit the current in circuits.

5. a) What is air?
   Air is a mixture of gases, mainly **nitrogen, oxygen, carbon dioxide, and trace gases**, that surrounds the Earth and is essential for life processes such as respiration and combustion.

   b) Mention two (2) uses of air.
   i. **Respiration** – Oxygen in air is used by humans, animals, and plants for breathing.
   ii. **Combustion** – Air provides oxygen required for burning fuels.

   c) List four (4) causes of air pollution.
   i. **Vehicle emissions** – Smoke and gases from cars and trucks pollute the air.
   ii. **Industrial emissions** – Factories release harmful gases like CO2 and sulfur dioxide.
   iii. **Burning of fossil fuels** – Coal, petrol, and wood burning release pollutants.
   iv. **Deforestation** – Reduces oxygen production and increases dust and particulates.

6. a) Define soil.
   Soil is the **upper layer of the earth's surface** consisting of mineral particles, organic matter, air, and water, which supports plant growth.

   b) Write three (3) activities that lead to soil degradation.
   i. **Deforestation** – Removing trees exposes soil to erosion.
   ii. **Overgrazing** – Excess livestock feeding damages vegetation and soil structure.
   iii. **Unsustainable agriculture** – Continuous cropping without replenishment depletes nutrients.

   c) Mention three (3) agents of soil erosion.
   i. **Water** – Rain and rivers carry soil particles away.
   ii. **Wind** – Strong winds remove topsoil in dry areas.
   iii. **Animals** – Movement of livestock can disturb and erode soil.

7. a) What is nervous system?
   The nervous system is a **complex network of nerve cells and tissues** that coordinates body activities by transmitting signals between the brain, spinal cord, and other body parts.

   b) Write the function of the following parts of human ear.

   i. Semicircular canals
   They help in **maintaining balance and detecting body position** in three-dimensional space.

   ii. Cochlea
   The cochlea **converts sound vibrations into nerve impulses** that the brain interprets as sound.

   iii. Hairs and mucus
   Hairs trap **dust and particles**, while mucus **moistens and protects the ear canal**.

8. a) Briefly explain one (1) importance of machine in our daily life.
   Machines **reduce human effort and save time** in performing tasks, making work more efficient and less strenuous.

b) Write four (4) examples of simple machines.
i. Lever
ii. Pulley
iii. Inclined plane
iv. Wheel and axle

c) Mention simple machine that magnify speed.
Wheel and axle – This machine allows a small rotation of the wheel to move the axle faster, increasing speed.

9. a) Write the long form of the following abbreviations on body health.

i. STI – **Sexually Transmitted Infection**
ii. STDs – **Sexually Transmitted Diseases**

b) List two (2) examples of pathogens.
i. **Bacteria** – e.g., Salmonella
ii. **Virus** – e.g., HIV

c) Mention four (4) precautions to be taken when dealing (care) with people living with HIV/AIDS.
i. **Use protective gloves** when handling blood or body fluids.
ii. **Avoid sharing sharp objects** like razors and needles.
iii. **Ensure safe sex practices** to prevent transmission.
iv. **Maintain hygiene** and a clean environment to prevent infections.

SECTION C: (20 Marks)
Answer any two (2) questions from this section.

10. a) With example differentiate between solute and solvent.

A **solute** is a substance that is dissolved in a liquid to form a solution. For example, **sugar** in water is a solute because it dissolves to form a sweet solution.

A **solvent** is a substance that dissolves the solute to form a solution. For example, **water** is a solvent because it dissolves sugar to form sugar solution.

b) Complete the following word equations by writing the name of solution formed.

i. Water + soap → **Soapy solution**
Soap dissolves in water to form a cleaning solution used for washing.

ii. Water + sugar → **Sugar solution**
Sugar dissolves in water producing a sweet solution commonly used in drinks.

c) Explain briefly why a stone sinks in water while a piece of wood floats in water.

A stone **sinks** in water because its density is higher than the density of water, making it heavier per unit volume than water.

A piece of wood **floats** in water because its density is lower than water. The air spaces in wood reduce its overall density, allowing it to be buoyant.

11. a) Draw the diagram to show the structure of the human brain and label forebrain, spinal cord, and the skull.

    - **Forebrain** – Controls voluntary actions, thinking, and memory.
    - **Spinal cord** – Transmits signals between the brain and the rest of the body.
    - **Skull** – Protects the brain from mechanical injuries.

    b) Explain briefly the structure of human tongue.

    The human tongue is a **muscular organ** in the mouth, covered with a mucous membrane. It has taste buds on its surface that detect **sweet, sour, salty, and bitter** tastes. It also helps in **swallowing, chewing, and speech**. The tongue is anchored to the floor of the mouth by the **lingual frenulum**.

12. a) i. Explain the term omnivorous animals.

    Omnivorous animals are animals that eat **both plants and other animals** as their source of food. They have adaptations in their teeth and digestive system to process both types of food.

    ii. Give one (1) example.

    Example: Humans. Humans consume both plant-based foods like fruits and vegetables, and animal-based foods like meat and fish.

    b) Explain four (4) threats to aquatic animals.

    i. **Water pollution** – Chemicals, plastics, and waste in water harm aquatic life.
    ii. **Overfishing** – Excessive fishing reduces population size, affecting species balance.
    iii. **Habitat destruction** – Draining wetlands, damming rivers, and clearing shorelines destroy natural habitats.
    iv. **Climate change** – Changes in temperature and water levels affect breeding and survival of aquatic animals.

13. a) Define the term electric circuit.

    An **electric circuit** is a **closed path through which electric current flows**, consisting of a power source, conductors, and components like resistors or lamps.

    b) Mention four (4) components of a simple electric circuit.

    i. **Battery or cell** – Provides electric energy.
    ii. **Conducting wires** – Allow the current to flow from one point to another.

iii. **Switch** – Controls the flow of current by opening or closing the circuit.
iv. **Load (lamp/resistor)** – Converts electrical energy into other forms like light or heat.

c) Given two resistors, R1 and R2. Write the formula for total resistance.

i. Resistors connected in series:
R_total = R1 + R2
The total resistance is the sum of individual resistances.

ii. Resistors connected in parallel:
1 / R_total = 1 / R1 + 1 / R2
The total resistance is less than the smallest resistor in the parallel combination.

d) Mention two (2) causes of electric hazards.

i. **Exposed wires** – Can cause electric shocks when touched.
ii. **Overloading circuits** – Excess current can lead to fire or damage to appliances.