

**THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA
PRIMARY SCHOOL LEAVING EXAMINATION**

05E

SCIENCE AND TECHNOLOGY

Time: 1:30 Hours

SOLUTIONS

Year: 2021

Instructions

1. This paper consists of sections A and B with a total of **forty five (45)** questions.
2. Answer **all** questions
3. Communication devices and any unauthorised materials are **not** allowed in the examination room.
4. Write your **Examination Number** and all other important information at the top right corner of every page.

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1. **The human excretory system is composed of four major organs. Which organ is responsible for the excretion of carbon dioxide and water in form of vapour?**

A Lungs

B Kidney

C Liver

D Nose

E Skin

Answer: A Lungs

Reason: The lungs excrete carbon dioxide and water vapor during respiration.

2. **An old man was staggering along the road after drinking a lot of alcohol. Which part of the ear was affected by alcohol?**

A Stapes

B Oval window

C Semicircular canals

D Cochlea

E Auditory nerve

Answer: C Semicircular canals

Reason: Semicircular canals control balance. Alcohol affects them, causing dizziness and loss of coordination.

3. **Some people have poor vision at night. Which vitamin does the person with this problem lack?**

A Vitamin A

B Vitamin B1

C Vitamin B2

D Vitamin C

E Vitamin D

Answer: A Vitamin A

Reason: Night blindness is caused by a deficiency of Vitamin A, which is essential for forming retinal pigments in the eye.

4. **A mother felt dizzy and her body became weak. After medical examination, the doctor found out that she had blood deficiency. What type of food would you advise her to eat?**

A Food with enough sugar
B Food with enough oil
C Food containing iron
D Carbohydrate food only
E Food without salt

Answer: C Food containing iron

Reason: Iron-rich foods help produce hemoglobin and treat anemia, which is a common cause of blood deficiency.

5. **Your friend fails to see well a ball which is placed close to him. Which type of glasses would you recommend for him?**

A Convex lens
B Concave lens
C Double lens
D Large lens
E Small lens

Answer: B Concave lens

Reason: Difficulty seeing nearby objects indicates myopia (short-sightedness), which is corrected using concave lenses.

6. **My brother cut his finger while peeling sweet potatoes. He tied the wound with a bandage, but he continued to bleed for a long time. What did the blood of my brother lack?**

A White blood cells
B Platelets
C Plasma
D Minerals
E Red blood cells

Answer: B Platelets

Reason: Platelets are responsible for blood clotting. A deficiency leads to prolonged bleeding.

7. **Farmers were educated by an expert in agriculture to stop using methods that cause soil erosion. Which method are the farmers not allowed to use?**

A To plant trees in the farm
B Terrace farming
C Contour farming
D Applying steps farming
E Clearing the farm using fire

Answer: E Clearing the farm using fire

Reason: Burning vegetation exposes soil to erosion by wind and water.

8. **Which group represents animals with a spinal cord?**

A Snake, Zebra, Snail, and Hyena
B Lizard, Butterfly, Zebra, and Lion
C Crocodile, Antelope, Elephant, and Grasshopper
D Antelope, Crocodile, Hippopotamus, and Giraffe
E Snail, Crab, Elephant, and Zebra

Answer: D Antelope, Crocodile, Hippopotamus, and Giraffe

Reason: These are all vertebrates with a spinal cord.

9. **Your young brother was surprised to see the symbol of a skull on electric poles and on the gallons of toilet detergents. What does this sign indicate?**

A Poison or danger
B Flammable
C Corrosive
D Explosive
E Irritant

Answer: A Poison or danger

Reason: The skull symbol universally warns of toxic or hazardous substances.

10. **Standard five pupils did an assignment of making a simple electric circuit using a dry cell, wire, and bulb. Which group succeeded to light the bulb?**

Answer: The group that connected the wire, bulb, and dry cell correctly in a complete circuit.

Reason: A complete circuit is required for current to flow and light the bulb.

11. **A pupil witnessed the school building collapsing after being hit by lightning. What do you recommend to be done to buildings so that such incidents do not occur in other buildings?**

- A They should be constructed using stones
- B They should be constructed using thick walls
- C They must have walls to protect lightning
- D They must be installed with earth wire
- E They must be installed with lightning rod

Answer: E They must be installed with lightning rod

Reason: Lightning rods protect buildings by safely directing lightning to the ground.

12. **Small particles of iron have entered into the eyes of a steel rod factory worker. What would you do to help him?**

- A Wash his face using clean water and soap
- B Use a magnet that will attract those particles
- C Use cotton buds to remove the particles
- D Use a clean cloth to wipe inside the eye
- E Make the person bend for the particles to fall down

Answer: B Use a magnet that will attract those particles

Reason: A magnet safely removes iron particles without causing further injury.

13. **John looked at the surface of stagnant water and saw his image. Which characteristic of light is displayed by this action?**

- A Travelling
- B Bending
- C Passing
- D Reflection
- E Absorption

Answer: D Reflection

Reason: Light bouncing off a smooth surface produces an image, which is reflection.

14. Which reason makes biogas better than firewood as a source of energy?

- A It gives out oxygen gas
- B It does not produce smoke when used
- C It gives out carbon dioxide gas
- D It is costless in production
- E It is used in small quantity

Answer: B It does not produce smoke when used

Reason: Biogas burns cleanly, reducing air pollution compared to firewood.

15. A plant absorbs water molecules from the soil through roots to different parts. Which way does the plant use to absorb water?

- A Osmosis
- B Diffusion
- C Distribution
- D Propagation
- E Sucking

Answer: A Osmosis

Reason: Plants absorb water from the soil through root hair cells by osmosis, which is the movement of water from a region of low solute concentration to high solute concentration.

16. Which action results into the formation of a new matter?

- A Dissolving sugar in water
- B Souring of milk
- C The change of water to vapour
- D Adding salt in food
- E Boiling a mixture of wax and water

Answer: B Souring of milk

Reason: Souring of milk is a chemical change because new substances (lactic acid) are formed.

17. Your friend asked you for assistance to open Microsoft Excel. Which steps would you follow?

- A Click start menu → Microsoft Office → Microsoft Excel

B Click start menu → Microsoft Word → Microsoft Excel

C Click start menu → Microsoft Excel → Microsoft Word

D Click start menu → Microsoft Excel → Microsoft Office

E Click start menu → Microsoft Office → Microsoft Word

Answer: A Click start menu → Microsoft Office → Microsoft Excel

Reason: This is the standard way to open Excel from the Start menu through Microsoft Office.

18. **The head teacher at Makuti Primary School wants to change the electronic keeping of pupils' attendance records from a manual book to a system. Which electronic machine would you advise to be used?**

A Television

B Computer

C Decoder

D System Unit

E Router

Answer: B Computer

Reason: A computer allows efficient electronic record-keeping and management of attendance data.

19. **The Science and Technology teacher requested you to have a Gmail account. Which first step would you follow to get the account?**

A To visit the www.gmail.com website

B To fill all information needed in the Gmail form

C To fill the phone number and birthdate in the Gmail form

D To choose the type of address you want in the Gmail form

E To visit www.yahoo.com and write the password correctly

Answer: A To visit the www.gmail.com website

Reason: Creating a Gmail account begins with visiting the official Gmail website.

20. **The news broadcast reported that most radios in Magunga village use which type of antenna? What disadvantage do they experience due to the use of that type of small loop antenna?**

A They cause defect of radio

B They cause loss of electrical energy

C They destruct speakers

- D They have high maintenance cost
- E They have electromagnetic interference

Answer: B They cause loss of electrical energy

Reason: Small loop antennas are less efficient and can result in loss of electrical energy, reducing signal reception.

21. **Why is it advised to shut down the computer by following the correct procedure?**

- A To protect it against unexpected power failure
- B To protect it from falling down
- C To reduce heat generated within the computer
- D To protect it against computer virus
- E To avoid losing unsaved information

Answer: E To avoid losing unsaved information

Reason: Proper shutdown ensures all unsaved data is stored and prevents corruption of files.

22. **The Kiswahili subject teacher sent pupils' results to their parents by e-mail, but they did not receive them. Which important thing did the teacher fail to consider when sending the e-mail?**

- A Writing the receivers' e-mail address correctly
- B Writing the heading of the message
- C Writing the sender e-mail address correctly
- D Signing out his e-mail account after using
- E Allowing the web browser to remember the password

Answer: A Writing the receivers' e-mail address correctly

Reason: If the e-mail address is incorrect, the message will not reach the intended recipient.

23. **Complex machines are made up of two or more simple machines. What is the importance of that make up?**

- A To increase efficiency
- B To increase attraction
- C To increase friction
- D To increase velocity
- E To reduce friction

Answer: A To increase efficiency

Reason: Combining simple machines increases the mechanical advantage and efficiency of the system.

24. **A lever has three main parts which are arranged in a specific order. Which arrangement best represents a third class lever?**

- A Effort, load, and fulcrum
- B Fulcrum, effort, and load
- C Fulcrum, load, and effort
- D Load, fulcrum, and effort
- E Effort, fulcrum, and load

Answer: E Effort, fulcrum, and load

Reason: In a third-class lever, the effort is applied between the fulcrum and the load.

25. **Which formula gives the relationship between mechanical advantage, load, and effort in a pulley system?**

- A Mechanical advantage = Load \div Effort
- B Load = Mechanical advantage \times Effort
- C Load = Mechanical advantage
- D Effort = Mechanical advantage
- E Effort = Mechanical advantage \times Load

Answer: A Mechanical advantage = Load \div Effort

Reason: Mechanical advantage is defined as the ratio of the load to the effort.

26. **Standard four pupils were asked to bring complex machines to be used in learning its parts. Which tools did they bring?**

- A Bicycle, sewing machine, and beam balance
- B Mortise lock, bicycle, and claw hammer
- C Mortise lock, sewing machine, and bicycle
- D Sewing machine, bicycle, and bottle opener

Answer: C Mortise lock, sewing machine, and bicycle

Reason: These are examples of complex machines made of multiple simple machines.

27. **Which is the unit of resistance in electricity?**

- A Volt
- B Ohm
- C Voltmeter

D Ampere

E Ammeter

Answer: B Ohm

Reason: Ohm is the SI unit of electrical resistance.

28. **Which set contains acidic substances?**

A Orange and wood ash

B Orange and lemon

C Wood ash and soda ash

D Orange and soda ash

Answer: B Orange and lemon

Reason: Both orange and lemon contain citric acid and are acidic in nature.

29. **White, red, black, yellow, and green clothes made of the same material were washed and kept in a place to dry from sunlight. Clothes of which colour will be the first to dry up?**

Answer: A White

Reason: White clothes reflect sunlight and heat less than dark colours, but they allow faster evaporation compared to black, which absorbs more heat but retains moisture longer.

30. **Your friend's clothes caught fire which was caused by petrol explosion. What are you supposed to do to put off the fire?**

A Remove all the victim's clothes

B Cover the victim with a cold piece of cloth

C Splash the victim with water

D Cover the victim with a heavy blanket

E Take the victim to the hospital

Answer: D Cover the victim with a heavy blanket

Reason: Smothering the flames with a heavy blanket cuts off oxygen and extinguishes the fire safely.

31. **A hunter was bitten by a snake on his leg. What kind of first aid is he supposed to be given?**

A Lay the victim down with the legs raised up

B Take the victim to hospital

C Scrub with ashes and salt

D Tighten the top part of the bitten leg

E Wash him/her by using clean water and soap

Answer: A Lay the victim down with the legs raised up

Reason: Keeping the victim calm and the bitten limb immobilized and slightly elevated slows the spread of venom. Immediate hospital treatment is also needed.

32. Your grandfather is a short-sighted person. Which food would you recommend him to use to help solve the problem?

A Bananas, oranges, and groundnuts

B Rice, pineapple, and meat

C Mango, carrots, and green vegetables

D Carrots, cassava, and beans

E Bread, bananas, and cassava

Answer: C Mango, carrots, and green vegetables

Reason: Carrots and green vegetables contain Vitamin A, which helps improve vision, particularly in low light.

33. Students are advised on how to handle plastic bottles to prevent environmental pollution. Which method would you advise?

A Burning them to prevent bottles to continue polluting

B Return them to the factory

C Break them into pieces and throw away

D Bury them in a pit

E Keep them in the store

Answer: B Return them to the factory

Reason: Returning bottles for recycling is the most environmentally friendly way to reduce pollution.

34. The Head Prefect led Standard Three pupils to clean the school environment to destroy mosquito breeding sites. Which main activities did they do?

A Slashing and filling up water pools

B Sweeping and planting trees

- C Planting flowers and slashing
- D Removing cobwebs and mopping
- E Covering full rubbish pits and digging new ones

Answer: A Slashing and filling up water pools

Reason: Removing stagnant water eliminates mosquito breeding sites, which is essential for preventing malaria.

35. Which of the following does not relate to the health principles required to be followed by each one in order to have good health?

- A Eat balanced diet
- B Environmental cleanliness
- C Using clean and safe water
- D Knowing different games
- E Resting and sleeping

Answer: D Knowing different games

Reason: While exercise is important, “knowing different games” does not directly contribute to health principles.

36. Which diseases are caused by the inheritance of disorders in genes from one generation to another?

- A Epilepsy and bilharzia
- B Sickle cell and haemophilia
- C Albinism and hepatic fever
- D Asthma and tuberculosis
- E Haemophilia and gonorrhea

Answer: B Sickle cell and haemophilia

Reason: These are genetic disorders inherited from parents.

37. What kind of food should people who do manual work of carrying luggage eat in large quantity?

- A Vitamins
- B Oils
- C Minerals

D Carbohydrates

E Proteins

Answer: D Carbohydrates

Reason: Carbohydrates provide energy needed for heavy physical work.

38. The human digestive system is made up of several parts. Which part absorbs water and minerals?

A Large intestine

B Small intestine

C Stomach

D Gall bladder

E Oesophagus

Answer: A Large intestine

Reason: The large intestine absorbs water and minerals from undigested food.

39. The density of wood is 20 kg/m^3 . If the volume of wood is 90 m^3 , find the mass of the wood.

Mass = Density \times Volume = $20 \times 90 = 1800 \text{ kg}$

Answer: D 1800 kg

40. Submarine is a type of ship which can either sink or float on water. What should be done when a submarine is in the water and is required to float?

A Water should be removed and the tanks filled with air

B Water should be removed and the tanks left empty without air

C To increase the upthrust in the tanks by using...

D To remove the air from the tanks to reduce weight

E To balance upthrust and gravitation force in the submarine

Answer: A Water should be removed and the tanks filled with air

Reason: Filling the tanks with air increases buoyancy, allowing the submarine to float.

41. Plants have chloroplast which absorbs sunlight energy for photosynthesis. Which other things are used by plants as raw materials for photosynthesis?

The other things used by plants as raw materials for photosynthesis are:

- **Carbon Dioxide:** Absorbed from the atmosphere through the leaves (specifically the stomata).
- **Water :** Absorbed from the soil through the roots.

42. A pregnant mother was instructed by the Doctor when attending maternity clinic that in the first three months after delivery, she should **breastfeed** her child instead of using powdered milk. Why was she given this advice?

She was given this advice because breast milk, especially the **colostrum** (the first milk produced):

- **Contains antibodies:** It provides **passive immunity** by giving the baby ready-made antibodies which protect the baby against many infections and diseases.
- **Perfectly balanced nutrients:** It contains the ideal balance of fats, sugars, water, and proteins necessary for the baby's growth and development.
- **Easy to digest:** It's more easily digestible than powdered milk.
- **Promotes bonding:** It helps create a strong emotional bond between the mother and the baby.

43. If a pupil connected a circuit which has a **potential difference** of **12 Volts** and a **current** of **3A** is flowing in it; find the **resistance** in the circuit.

We use Ohm's Law, which states that the voltage (V) across a conductor is directly proportional to the current (I) flowing through it, where the constant of proportionality is the resistance (R).

$$V = I \times R$$

To find the resistance (R):

$$R = V / I$$

Potential Difference, V = 12 Volts

Current, I = 3 Amperes (A)

$$R = 12 \text{ V} / 3 \text{ A} = 4 \text{ Ohms } (\Omega)$$

The resistance in the circuit is 4 Ohms (Ω).

44. (a) What are the functions performed by the parts labelled A and B?

The figure shows the human urinary/excretory system.

Part A (Renal Artery): Carries **unfiltered (dirty) blood** rich in **nitrogenous waste** (like urea) from the body/heart into the kidney for cleaning.

Part B (Renal Vein): Carries **filtered (clean) blood** with a balanced concentration of salts and water **away** from the kidney back to the body/heart.

(b) What is the relationship of the part labelled C and the one labeled D in performing their functions?

Part C is the **Ureter**, which is a tube carrying **urine** from the kidney down to the bladder.

Part D is the **Urinary Bladder**, which is a muscular sac that **stores** the urine received from the ureters until it is ready to be voided (passed out of the body).

Relationship: The **Ureters (C)** deliver the end product of the kidneys (urine) to the **Urinary Bladder (D)**, which then performs the function of temporary storage. They work sequentially: **C transports, D stores.**

45. Health specialists insist that, people should frequently perform exercises. Why is it important to adhere to this advice?

It is important to adhere to the advice of frequent exercise because it offers several benefits:

- **Maintains a healthy weight:** It helps in burning calories, preventing **obesity** and associated diseases.
- **Strengthens the heart and lungs:** It improves **cardiovascular health** by making the heart more efficient at pumping blood and increasing lung capacity.
- **Strengthens muscles and bones:** It improves posture, flexibility, and helps prevent conditions like osteoporosis.
- **Reduces stress and improves mood:** Physical activity stimulates the production of **endorphins**, which are natural mood elevators and stress relievers.
- **Boosts the immune system:** Regular exercise can strengthen the body's ability to fight off infections.