THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

033/1 **BIOLOGY 1**

(For Both School and Private Candidates)

Duration: 3 Hours **SOLUTIONS** **Year: 2025**

Instructions

1. This paper consists of sections A, B and C with a total of **eleven (11)** questions.
2. Answer **all** questions in section A and B and **two (2)** questions from section C.
3. Section A carries **sixteen (16)** marks, section B **fifty four (54)** marks and section C **thirty (30)** marks.
4. All writing must be in **blue** or **black** pen, except drawing which must be in pencil.
5. Communication devices and any unauthorised materials are **not** allowed in the examination room.
6. Write your **Examination Number** on every page of your answer booklet(s)

SECTION A

1. For each of the items (i) to (x), the question is copied, alternatives are copied, then the correct answer is given with a reason.

(i) Farmers at Mtakuja village observed a continuous decrease of amount of beans yield in their farms. How is this step in the scientific process refers?

A Experimentation
B Problem identification
C Hypothesis
D Conclusion
E Data collection

Correct answer: B Problem identification.
Reason: Observing a continuous decrease in yield is the recognition of a problem that needs investigation, which is the problem identification stage of the scientific process.

(ii) Form Two students who recently visited Mikumi National Park saw Zebra Shrubs Giraffe Lion Cheetah Grasses and Mushroom. Which of these organisms would they group as primary consumers?

A Grasses and shrubs
B Giraffe and shrubs
C Lion and cheetah
D Zebra and giraffe
E Mushroom and zebra

Correct answer: D Zebra and giraffe.
Reason: Primary consumers are herbivores that feed directly on producers. Zebra and giraffe feed on grasses and shrubs.

(iii) In the process of making doughnuts a woman mixed wheat flour yeasts sugar and water kneaded the mixture and covered it. After half an hour the dough raised. Which one of the following made the dough to rise?

A Yeasts
B Glucose
C Wheat flour
D Water
E Sugar

Correct answer: A Yeasts.
Reason: Yeast ferments sugars and produces carbon dioxide gas, which causes the dough to rise.

(iv) A bleeding pregnant woman was confirmed to have an embryo implanted in the fallopian tube. Which complication was she suffering from?

A Preeclampsia
B Miscarriage
C Breech birth
D Premature birth
E Ectopic pregnancy

Correct answer: E Ectopic pregnancy.
Reason: Implantation of an embryo outside the uterus, especially in the fallopian tube, is known as ectopic pregnancy.

(v) Which mechanism does the human body undergo in response to cold weather condition?

A Vasodilation of arterioles
B Vasoconstriction of arterioles

C Sweating and panting

D Relaxation of erector muscles

E Decreased metabolic rate

Correct answer: B Vasoconstriction of arterioles.

Reason: Vasoconstriction reduces blood flow to the skin, minimizing heat loss in cold conditions.

(vi) Which diseases occur worldwide?

A Tuberculosis and cholera

B Malaria and bilharzia

C COVID 19 and cholera

D AIDS and COVID 19

E AIDS and tuberculosis

Correct answer: D AIDS and COVID 19.

Reason: Pandemic diseases are those that occur worldwide, and both AIDS and COVID 19 affect populations globally.

(vii) If you have noticed water spills on the floor of the class room what would you do to prevent accident?

A Wait for the floor to dry

B Walk slowly on the floor

C Wipe the floor immediately

D Apply mud on the floor

E Shift to another classroom

Correct answer: C Wipe the floor immediately.

Reason: Removing the water immediately eliminates the risk of slipping and prevents accidents.

(viii) Which one of the following is not a part of a movable joint?

A Bone
B Tendon
C Cartilage
D Synovial fluid
E Ligament

Correct answer: B Tendon.
Reason: Tendons connect muscles to bones and are not structural components of movable joints.

(ix) Which one of the following are examples of sex linked characteristics in human?

A Colour blindness and albinism
B Haemophilia and tongue rolling
C Colour blindness and haemophilia
D Tongue rolling and blood group
E Blood group and haemophilia

Correct answer: C Colour blindness and haemophilia.
Reason: Both traits are controlled by genes located on the X chromosome.

(x) Organisms in class Reptilia have dry skin with horny scales. Which of the following organisms fall under this category?

A Lizard crocodile turtle and snake
B Crocodile bat chicken and lizard
C Snake salamander frog and crocodile
D Turtle mouse snake and salamander
E Eagle flamingo chicken and lizard

Correct answer: A Lizard crocodile turtle and snake.

Reason: These organisms are reptiles characterized by dry skin covered with horny scales.

2. Match the roles of the hormones in **List A** with their corresponding hormones in **List B** by writing the letter of the correct response beside the item number in the answer booklet(s) provided.

List A	**List B**
(i) Controls contraction and relaxation of uterine walls during birth.	A Antidiuretic
(ii) Promotes conversion of excess glucose into glycogen in the blood.	B Thyroxine
(iii) Regulates amount of water reabsorption in the kidney tubules.	C Adrenaline
(iv) Stimulates milk production in lactating mammals.	D Oxytocin
(v) Controls metabolic activities in the body.	E Glucagon
(vi) Promotes development of secondary sexual characteristics in females.	F Insulin
	G Oestrogen
	H Prolactin

Answers

(i)	**(ii)**	**(iii)**	**(iv)**	**(v)**	**(vi)**
D	F	A	H	B	G

SECTION B

3. Mkutano villagers use traditional methods to process preserve and store variety of foods they obtain from their daily activities. Outline six advantages of such methods.

Traditional food preservation methods are cheap and affordable because they rely on locally available materials and simple techniques.

They help extend the shelf life of foods by reducing spoilage and wastage.

Traditional methods preserve food flavor and nutritional value when properly applied.

They do not require electricity, making them suitable for rural areas.

These methods promote food security during periods of scarcity.

They preserve cultural knowledge and indigenous practices passed through generations.

4. With the aid of a labeled diagram describe the events which take place during the prophase stage of mitosis.

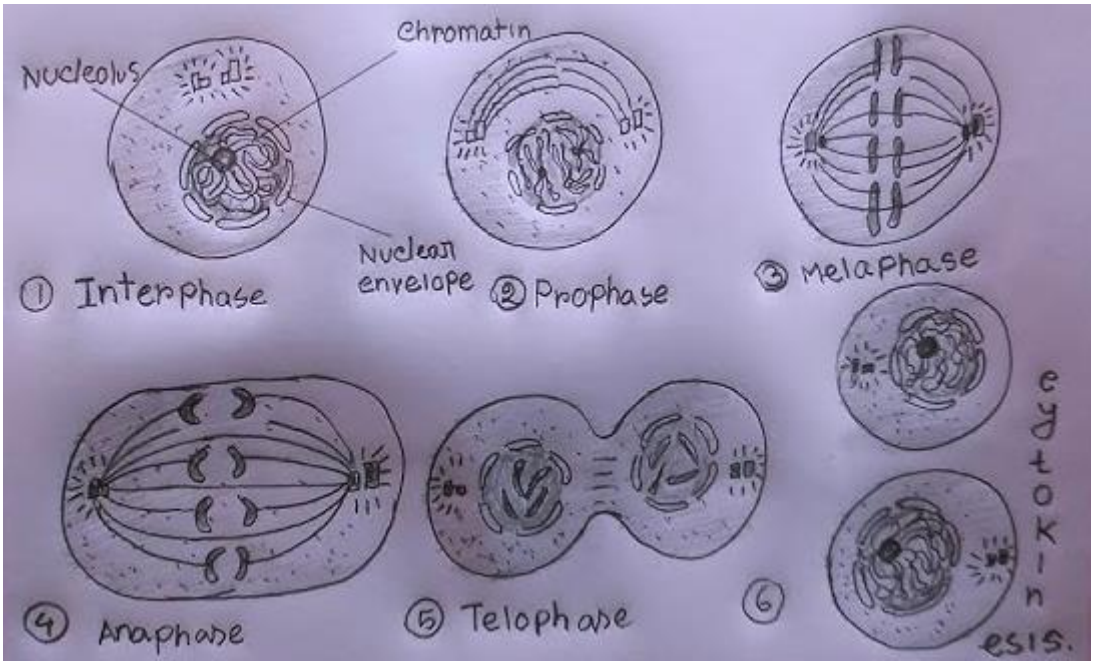
During prophase, chromatin fibers condense to form visible chromosomes, each consisting of two sister chromatids joined at the centromere.

The nuclear membrane gradually breaks down, allowing spindle fibers to interact with chromosomes.

The nucleolus disappears, indicating the cell is preparing for division.

Spindle fibers begin to form from centrioles and extend toward opposite poles of the cell.

Chromosomes start moving toward the equatorial plane under the influence of spindle fibers.



5. How are the cardiac muscles adapted to perform their roles? Give six points.

Cardiac muscles are branched, allowing strong and coordinated contractions.

They are interconnected by intercalated discs, which ensure rapid transmission of impulses.

They are rich in mitochondria, providing sufficient energy for continuous activity.

Cardiac muscles are involuntary, allowing the heart to function without conscious control.

They have a rich blood supply to provide oxygen and nutrients.

They are fatigue resistant, enabling the heart to beat continuously throughout life.

6. Bacteria Amoeba and Non flowering plants reproduce asexually. Explain three merits and three demerits of the type of reproduction exhibited by these organisms.

Asexual reproduction is fast, allowing rapid population increase.

It requires only one parent, making reproduction possible in isolation.

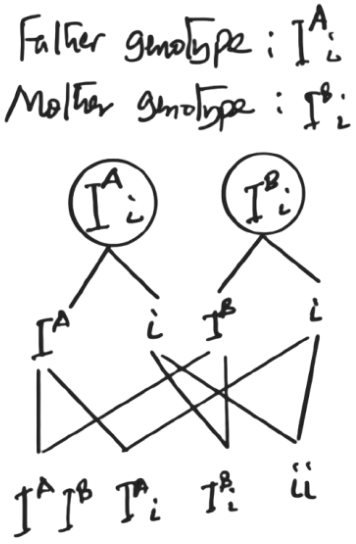
It conserves energy since mating is not required.

However, it produces no genetic variation, making organisms vulnerable to diseases.

Unfavorable conditions can wipe out entire populations due to identical traits.

It limits evolutionary adaptation to changing environments.

7. A man with heterozygous blood group A married a woman with heterozygous blood group B. One among their offsprings produced was blood group O. Use genetic cross to show the probability of producing such offspring.



Father genotype: IAi

Mother genotype: IBi

Gametes from father: IA, i

Gametes from mother: IB, i

Offspring genotypes:

IAIB, IAi, IBi, ii

Probability of blood group O (ii) is 1 out of 4, which is 25 percent.

8. By using example explain how each of the following provide evidences for organic evolution. Give three points for each.

(a) Fossil records

Fossils show progressive changes in organisms over time, indicating gradual evolution.

They reveal extinct species that link past and present organisms.

Fossils help establish evolutionary timelines through geological layers.

(b) Comparative embryology

Early embryos of different species show similar structures, suggesting common ancestry.

Shared developmental stages indicate evolutionary relationships.

Differences appear later, showing divergence from a common origin.

SECTION C

9. You are invited as a guest speaker in a youth meeting to fight against drug abuse. Recommend six preventive and control measures you would address to them.

One important preventive measure against drug abuse is education and awareness. Youths should be taught about the health, social, and economic dangers of drug abuse so that they can make informed decisions and avoid experimenting with drugs.

Parental guidance and family support play a major role in preventing drug abuse. When parents communicate openly with their children, monitor their behavior, and provide emotional support, youths are less likely to engage in drug use.

Strict enforcement of laws controlling production, distribution, and use of drugs helps reduce availability. When laws are enforced effectively, access to drugs becomes limited, discouraging abuse among young people.

Provision of counseling and rehabilitation services is essential for control of drug abuse. Youths who are already addicted can receive psychological support and treatment to help them recover and reintegrate into society.

Engaging youths in sports, vocational training, and income generating activities helps reduce idleness. When young people are productively occupied, they are less likely to turn to drugs out of boredom or frustration.

Peer education and support groups also help prevent drug abuse. Positive peer influence encourages responsible behavior and helps youths resist pressure to use drugs.

10. Matatu villagers have appointed you as a chair person for campaign against gonorrhoea prevention. Explain three ways of transmission and five measures that will help them to prevent the disease.

Gonorrhoea is mainly transmitted through unprotected sexual intercourse with an infected person. The bacteria are passed from one individual to another through contact with infected body fluids during sexual activity.

The disease can also be transmitted from an infected mother to her baby during childbirth. This can result in serious health complications for the newborn, including eye infections and blindness.

Another mode of transmission is through sharing contaminated sex toys without proper cleaning. This allows the bacteria to move from one person to another.

One effective preventive measure is practicing safe sex through consistent and correct use of condoms. Condoms reduce direct contact with infected fluids, thereby lowering the risk of transmission.

Faithfulness to one uninfected sexual partner helps prevent gonorrhoea. Limiting the number of sexual partners reduces exposure to sexually transmitted infections.

Regular medical screening and testing enable early detection of infection. Early diagnosis allows timely treatment and prevents further spread of the disease.

Prompt treatment of infected individuals and their partners is essential. Treating all affected persons breaks the chain of transmission in the community.

Health education campaigns increase community awareness about gonorrhoea. When people understand symptoms, transmission, and prevention methods, they are more likely to protect themselves.

11. Analyse five environmental factors which affect the rate of transpiration in plants.

Temperature greatly influences the rate of transpiration. High temperatures increase evaporation of water from leaf surfaces, causing transpiration to occur at a faster rate.

Humidity affects transpiration by controlling the diffusion of water vapor. Low humidity increases transpiration because dry air allows more water vapor to move out of the leaf.

Wind speed also affects transpiration rate. Increased wind removes the moist air around leaves, maintaining a diffusion gradient that allows continuous water loss.

Light intensity influences transpiration by affecting stomatal opening. In bright light, stomata open wider to allow gas exchange, which increases water loss through transpiration.

Availability of water in the soil determines how much water a plant can absorb. When soil water is adequate, transpiration proceeds normally, but when water is scarce, stomata close and transpiration rate decreases.