

KENYA CERTIFICATE OF BASIC EDUCATION

SENIOR SCHOOL ASSESSMENT

AUGUST HOLIDAY ACTIVITIES 2026

GRADE 10 – BIOLOGY

Time: 2 Hours



LEARNER'S DETAILS

Name: _____ School: _____

Assessment Number: _____ Date: _____

School Code: _____ Signature: _____

INSTRUCTIONS TO CANDIDATES

1. Write your name in the spaces provided above.
2. Write the name of your school and your school code in the spaces provided.
3. Write your assessment number and the date of the assessment and sign in the spaces provided.
4. This paper consists of two sections: A and B.
5. Answer all questions in section A and section B.
6. Answer the questions in English.
7. All answers MUST be written in the spaces provided in the paper.
8. Do NOT remove any page from this question paper.

FOR OFFICIAL USE ONLY

SECTION	SECTION A	SECTION B	% SCORE	EE1	EE2	ME1	ME2	AE1	AE2	BE1	BE2
SCORE RANGE	30 MARKS	50 MARKS		90-100	75-89	58-74	41-57	31-40	21-30	11-20	1-10
POINTS				8 POINTS	7 POINTS	6 POINTS	5 POINTS	4 POINTS	3 POINTS	2 POINTS	1 POINT
LEARNER'S TOTAL SCORE											

SECTION A (30 MARKS)

Answer ALL questions in this section.

1. During a nature walk at Nairobi National Park, learners used various apparatus to collect specimens.
 - a) Identify the apparatus used to collect small crawling insects such as beetles from a pit in the ground. _____ (1 Mark)
 - b) Mention one preservative commonly used for the wet preservation of animal specimens in a school laboratory. _____ (1 Mark)

c) Outline two factors that should influence a learner's choice of a Biology-related career. (2 Marks)

i. _____

ii. _____

2. A Grade 10 learner at Mang'u High School is researching various fields of study within Biology to help decide on a future career.

Match the field of study in Column A with the correct description in Column B. (4 Marks)

COLUMN A: FIELD

COLUMN B: DESCRIPTION

i) Entomology

A. Study of the internal structure of organisms.

ii) Anatomy

B. Study of insects and their relationship to the environment.

iii) Taxonomy

C. Study of the inheritance and variation of traits.

iv) Genetics

D. Study of classification and naming of organisms.

3. State whether the following statements are TRUE or FALSE. (4 Marks)

a) An electron microscope has a higher resolution than a light microscope. _____.

b) Animal cells possess a large central vacuole and a cellulose cell wall. _____.

c) The cell is considered the basic functional unit of life. _____.

d) Magnification is the ability of a microscope to distinguish two close points as separate. _____.

4. Kamau, a student at Alliance High School, is observing a plant cell under a light microscope.

a) Define the term "staining" as used in the preparation of temporary slides. (2 Marks)

b) Distinguish between resolution and magnification of a microscope. (2 Marks)

5. Three learners are discussing the Chemicals of Life.

Zawadi: "Proteins are tested using Benedict's solution which turns orange-red."

Mutua: "Actually, Zawadi, Benedict's test is for reducing sugars; proteins are tested using the Biuret reagent."

Achieng: "And don't forget that Vitamin C is tested using DCPIP, which becomes decolorized."

a) Identify the learner who made a false statement. (1 Mark)

b) List two factors that affect the rate of enzymatic reactions in a cell. (2 Marks)

i. _____

ii. _____

6. A pilot flying over Kisumu is experiencing high energy demands.

a) Define the Respiratory Quotient (RQ). (2 Marks)

b) List four general characteristics of an efficient respiratory surface in animals. (4 Marks)

i. _____

ii. _____

iii. _____

iv. _____

7. Mention three levels of organization in a multicellular organism, starting from the smallest unit.
(3 Marks)

i. _____

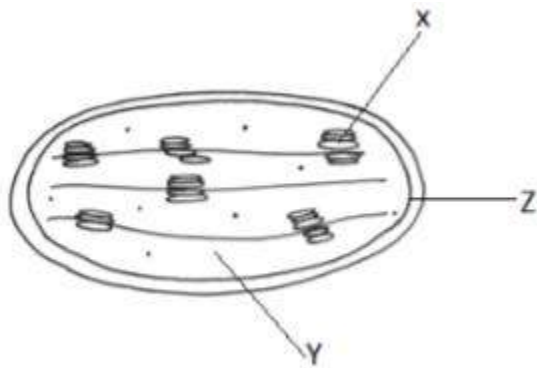
ii. _____

iii. _____

SECTION B: (50 MARKS)

Answer ALL questions in this section.

8. (a) Below is a diagram of an organelle found in green plants.



i) Name the organelle illustrated above. (1 Mark)

ii) State the function of the organelle above. (1 Mark)

iii) Identify the parts labelled. (3 Marks)

X: _____

Y: _____

Z: _____

iv) State two adaptations of the organelle to its function. (2mks)

v) Write the word equation for photosynthesis. (1 Mark)

9. A Grade 10 class is studying a cross-section of a dicotyledonous stem.

a) Name the two main vascular tissues involved in transport. (2 Marks)

i. _____

ii. _____

b) Relate the structure of xylem to its function in transporting water. (3 Marks)

c) Describe the Girdling experiment and state its purpose. (3 Marks)

10. Plants in the Nakuru region adapt to different environments.

a) Name the sites of gaseous exchange in:

i) A woody stem _____ (1 Mark)

ii) A leaf _____ (1 Mark)

b) Explain the Photosynthetic Theory of the opening and closing of stomata. (4 Marks)

11. Learners at Starehe Boys' Centre are comparing the mouthparts of various insects.

a) Match each insect with its feeding mode. (3 Marks)

Mosquito: _____

Butterfly: _____

Housefly: _____

b) Relate the structure of a hawk's beak to its feeding habit. (2 Marks)

12. A mammalian heart is being studied at a health facility in Mombasa.

a) Name the four chambers of the mammalian heart. (4 Marks)

i. _____

ii. _____

iii. _____

iv. _____

b) Describe the pumping mechanism of the heart during ventricular systole. (3 Marks)

c) State the significance of the Rhesus factor in blood transfusion. (3 Marks)

13. A learner is checking their breathing rate after physical exercise.

a) Identify the respiratory surface in the human lung. (1 Mark)

b) Compare inhaled air and exhaled air in terms of Oxygen and Carbon (IV) Oxide. (4 Marks)

c) Explain the concept of oxygen debt. (3 Marks)

14. group of learners is starting a project on preserving biological specimens for sale to schools.

a) Define the following terms:

i) Revenue (1 Mark)

ii) Profit (1 Mark)

b) List two ways of ensuring the safety and quality of food products using information found on packaging labels. (2 Marks)

i. _____

ii. _____

BIOLOGY - MARKING SCHEME (VERSION 2.0)

SECTION A (30 MARKS)

1. Specimen Collection and Careers (4 Marks)

a) Apparatus:

- Pitfall trap

b) Preservative:

- Ethanol (70%)

OR

- Formalin/Formaldehyde

c) Factors influencing career choice:

Any two:

- Interest
- Ability/Aptitude
- Academic performance
- Talent
- Availability of career opportunities
- Personal goals

2. Matching Fields of Study (4 Marks)

i) Entomology - B

ii) Anatomy - A

iii) Taxonomy - D

iv) Genetics - C

3. Cell Biology (4 Marks)

a) TRUE

b) FALSE

c) TRUE

d) FALSE

4. Microscopy (4 Marks)

a) Staining:

The process of applying a dye to a specimen to increase contrast and make structures more visible under a microscope.

b) Difference between Resolution and Magnification:

Resolution:

Ability of a microscope to distinguish two close points as separate.

Magnification:

The number of times an image is enlarged compared to its actual size.

5. Chemicals of Life (3 Marks)

a) Learner who made a false statement:

- Zawadi

b) Factors affecting enzyme activity:

Any two:

- Temperature
- pH
- Enzyme concentration
- Substrate concentration
- Presence of inhibitors

6. Respiration and Gaseous Exchange (6 Marks)

a) Respiratory Quotient (RQ):

The ratio of the volume of carbon (IV) oxide produced to the volume of oxygen consumed during respiration.

b) Characteristics of an efficient respiratory surface:

- i) Large surface area
- ii) Thin membrane
- iii) Moist surface
- iv) Rich blood supply/Highly vascularized

7. Levels of Organization (3 Marks)

Cell → Tissue → Organ

SECTION B (50 MARKS)

8. Chloroplast and Photosynthesis (8 Marks)

a)

(i). Chloroplast;

(ii). Site for photosynthesis;

(iii).

- X- Granum
- Y - Stroma
- Z- Inner membrane

(iv).

(i) Stroma has numerous enzymes to catalyse photosynthetic reactions

(ii) Granum has chlorophyll to trap light energy for photosynthesis;

v) Word equation:

Carbon (IV) Oxide + Water $\rightarrow$ Glucose + Oxygen
(Using light energy and chlorophyll)

9. Plant Transport (8 Marks)

a) Vascular tissues:

i) Xylem

ii) Phloem

b) Adaptations of xylem:

- Hollow tubes allow free movement of water.
- Absence of cytoplasm reduces resistance.
- Lignified walls prevent collapse.
- Continuous tubes enable efficient transport.

(Any three)

c) Bark Ringing (Girdling) Experiment:

- A ring of bark containing phloem is removed.
- Xylem remains intact.

- Food accumulates above the ring.
- Demonstrates that phloem transports manufactured food.

10. Gaseous Exchange in Plants (6 Marks)

a)

i) Woody stem:

- Lenticels

ii) Leaf:

- Stomata

b) Photosynthetic Theory:

- During daylight, guard cells photosynthesize.
- Sugars accumulate in guard cells.
- Osmotic potential decreases.
- Water enters by osmosis.
- Guard cells become turgid.
- Stomata open.
- At night water leaves guard cells.
- Guard cells become flaccid and stomata close.

11. Animal Nutrition (5 Marks)

a) Feeding modes:

Mosquito:

- Piercing and sucking

Butterfly:

- Siphoning

Housefly:

- Sponging/Lapping

b) Hawk's beak:

- Strong
- Sharp
- Curved
- Hooked
- Adapted for tearing flesh from prey

(Any two)

12. Mammalian Heart and Transport (10 Marks)

a) Chambers of the heart:

- i) Right Atrium
- ii) Right Ventricle
- iii) Left Atrium
- iv) Left Ventricle

b) Ventricular Systole:

- Ventricles contract.
- Pressure increases in ventricles.
- Blood is pumped into pulmonary artery and aorta.
- Atrioventricular valves close.
- Backflow of blood is prevented.

(Any three)

c) Significance of Rhesus Factor:

- Determines blood compatibility.
- Prevents dangerous transfusion reactions.
- Important during pregnancy.
- Important in repeated blood transfusions.

(Any three)

13. Gaseous Exchange in Humans (8 Marks)

a) Respiratory surface:

- Alveolus/Alveoli

b) Comparison of inhaled and exhaled air:

Inhaled Air:

- Oxygen - about 21%
- Carbon (IV) Oxide - about 0.03%

Exhaled Air:

- Oxygen - about 16%
- Carbon (IV) Oxide - about 4%

c) Oxygen Debt:

- Extra oxygen required after vigorous exercise.
- Used to break down accumulated lactic acid.
- Restores the body to normal conditions.

14. Financial Literacy and Safety (5 Marks)

a)

i) Revenue:

Total amount of money received from sales.

ii) Profit:

Amount remaining after expenses are deducted from revenue.

b) Food safety from labels:

Any two:

- Check expiry date.
- Check manufacturing date.
- Verify ingredients.
- Check preservatives used.
- Check storage instructions.
- Confirm certification/quality marks.