

PRIME MINISTER'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT
DAR ES SALAAM AND GEITA REGIONS
FORM FOUR INTERSCHOOL PRE - MOCK EXAMINATION APRIL 2026

033/1

BIOLOGY 1 - MARKING GUIDE

SECTION A (16 MARKS)

1. @ 1 Mark, Total = 10 Marks

i	ii	iii	iv	v	vi	vii	viii	ix	x
A	C	B	D	B	A	D	C	A	D

2. @ 1 Mark, Total = 6Marks

COLUMN A	i	ii	iii	iv	v	vi
COLUMN B	K	B	H	D	C	E

SECTION B (54 MARKS)

3. a) i. prokaryotic cell @2 marks

ii. A. Pilli/fimbriae

B. Slime capsule @ 3 marks

C. Cell wall

D. Cytoplasm

E. Circular DNA/genetic material

F. Free ribosomes

b) Differences between prokaryotic cell and eukaryotic cell @1 mark = 5 Marks

PROKARYOTIC CELL	AMOEBIA (EUKARYOTIC) CELL
i. Has no true nucleus	Has true nucleus
ii. DNA is circular	Has linear DNA
iii. Cellulose or Chitin cell wall	Cell wall is murein (a carbohydrate protein complex)
iv. They do not have membrane-bound organelles, such as mitochondria	They contain specialized membrane – bound organelles, such as Mitochondria and chloroplasts.
v. They are smaller in size than eukaryotic cells.	They are relatively large compared
vi. They reproduce by binary fission or conjugation	They reproduce by asexually mitosis and sexually by meiosis.
vii. Aerobic respiration is done in mesosomes	Aerobic respiration occurs in mitochondria
viii. Able to undergo nitrogen fixation	Have no ability of fixing nitrogen

4. a) A taxon is a group into which organisms are classified based on shared characteristics.

OR

A Taxonomic Hierarchy is the arrangement of living organisms into a series of ranked categories based on their similarities and differences, from the most general to the most specific.

1.5 marks

b) ILLUSTRATION by using man as an example, the taxons are:

KINGDOM = Animalia

PHYLUM = Chordata

CLASS = Mammalia

ORDER = Primate

FAMILY =

Hominidae GENUS

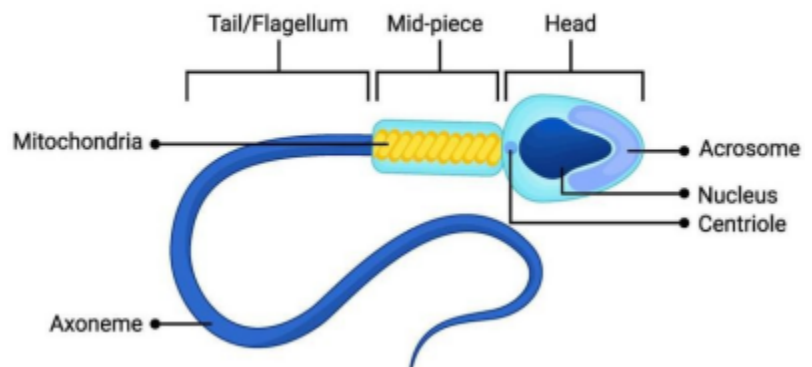
= Homo

SPECIES = sapiens (*Homo sapiens*)

@0.5mark = total 3.5 marks

5. a)

Human Sperm



- b) i. **Acrosome (Head cap)**; Releases enzymes to break down the egg's protective layer for

fertilization.

- ii. **Nucleus (Head)**; Carries parental genetic materials (haploid set of chromosomes).

- iii. **Centriole (Neck)**; Help organize cell division after fertilization.

- iv. **Mitochondria (Mid piece)**; Generates energy (ATP) for motility, enabling the

sperm

to swim long distances.

- v. **Flagellum (Tail)**; Provides locomotion, allowing sperm to move towards the egg.

6. a) Importance of mineral elements in photosynthesis
 - Nitrogen**
 - i. Required for synthesis of proteins and enzymes involved in photosynthesis.
 - ii. Important for formation of photosynthesis.
 - Magnesium**
 - i. Component of chlorophyll molecule.
 - ii. Activates enzymes involved in photosynthesis.
 - Potassium**
 - i. Regulates opening and closing of stomata.
 - ii. Helps in enzyme activation and transport of photosynthetic products.
 - b) Effects of fertilizer shortage on plant growth
 - i. Reduced chlorophyll formation.
 - ii. Stunted plant growth due to lack of essential nutrients.
 - iii. Yellowing of leaves (chlorosis) especially due to nitrogen deficiency.
 - iv. Reduced crop yield.
 - v. Poor plant health and increased susceptibility to diseases.
 - c) The ways are:
 - i. Use of organic manure (compost, manure dung).
 - ii. Crop rotation with legumes to improve soil nitrogen.
 - iii. Use of natural fertilizers (green manure).
 - iv. Efficient use of available fertilizers (proper application methods).
7. a) Possible reasons are;
 - i. Depletion of nutrients.
 - ii. Accumulation of toxic waste products.
 - iii. Lack of oxygen.
 - iv. Lack of other essential factors like space.
 - b) i. Light (increases rate of photosynthesis)
 - ii. Water (maintains turgidity of cells and helps the plant to grow upright)
 - iii. Temperature (affects enzymes activity)
 - iv. Carbon dioxide (increases levels of photosynthesis)
 - v. Oxygen (needed for respiration for energy)
 - vi. Mineral nutrients (supply essential elements)
8. a) i. **Continuous variation** refers to characteristics that show a smooth range of values with no clear gaps between them, height of individuals and body weight.
 - ii. **Discontinuous variation** refers to the characteristics that fall into distinct categories with no intermediate values, blood group and sex.
 - b) Evidences of organic evolution are;
 - i. Fossil records
 - ii. Comparative anatomy
 - iii. Embryology
 - iv. Comparative physiology
 - v. Molecular biology
 - vi. Biogeography
 - vii. Artificial selection
 - viii. Direct observation

9. **Balanced diet** is the diet that contains all the necessary nutrients in the correct proportion to maintain good health, growth, and body functions. Components of balanced diet are;

i. **Carbohydrates;**

- Provide energy for daily activities.
- Help in respiration to release energy.
- Prevent the body from using proteins for energy.

ii. **Proteins;**

- Growth and repair of body tissues.
- Formation of enzymes and hormones
- Help in body defense (antibodies)
- Can provide energy if needed

iii. **Fats (Lipids);**

- Provide and store energy.
- Insulate the body to reduce heat loss.
- Protect vital organs (shock absorber)
- Help in absorption of fat-soluble vitamins (A,B,E)

iv. **Vitamins**

- Boost immunity and prevent diseases.
- Regulate body processes.
- Maintain healthy skin, eyes and bones.
- Help in metabolism of nutrients.

v. **Minerals**

- Formation of bones and teeth (calcium and phosphorus).
- Formation of blood.
- Maintain nerve and muscle function.
- Help in body regulation.

vi. **Water**

- Acts as a solvent for chemical reactions.
- Transportation of nutrients and waste.
- Regulates body temperature (sweating).
- Helps in digestion and excretion.

vii. **Roughage (fiber);**

- Aids digestion.
- Prevents constipation.
- Helps maintain a healthy gut.
- Can help control blood sugar levels

10.a) Gregor Mendel used garden peas because;

- i) They have clear contrasting traits (tall vs short, yellow vs green, hence easy to observe)
- ii) They reproduce quickly therefore gives results in a short time.
- iii) They can self-pollinate and cross-pollinate hence allows controlled experiments.

b) Major conclusions of Mendel's experiments are

- i. Traits are controlled by discrete units(genes), not blended.
- ii. Each trait is controlled by a pair of alleles, one from each parent.
- iii. Some alleles are dominant while others are recessive.
- iv. Traits are passed as distinct units(genes) not mixed together.
- v. Genes for different traits are inherited independently.

c) Mendel's first law of inheritance states that;" Each organism carries two alleles for a given trait, and these alleles separate during gamete formation, as a result each gamete receives one allele from each pair."

- d) Let C represent a gene without defect
c represent a defect gene
heterozygous parents are Cc

Therefore, Cc x Cc

male	C	c
Female		
C	CC	Cc
c	Cc	cc

Genotype; CC, 2 Cc, cc

Phenotype; 3 normal and 1 affected

Therefore the couple will have a homozygous normal child, two carrier children and one affected.

11.a) **Behavioral mechanisms;**

- i. Huddling
- ii. Basking
- iii. Seeking shade
- iv. Change of activity patterns(reducing activities to save energy)

b) **Physiological mechanisms;**

- I. Shivering
- ii. Vasoconstriction.
- iii. Vasodilation
- iv. Sweating
- v. Panting

MARKS

5- a) Tittle 0.5

Drawing 0.5

Any six (6) labels @ 0.5

Total 9 marks

b) Functions @ 1

6- a) 3 marks

b) 3 marks

Total 9 marks

c) 3 marks

7- a) @ suggestion 2 marks

b) @ factor and an example 1.5 marks

Total 9 marks

8 -a) @ term 1.5mark

Total 9 marks

b) @ evidence 1.5 mark

9- Introduction 0.5 marks

- @ of seven (7) components 2 marks

Total 15 marks

- Conclusion 0.5 marks

10 – a) @ reason 1 mark

b) @ conclusion 1 mark

c) Stating the law 2 marks

d) Identifying parents' genotypes 2 marks

Total 15 marks

Drawing 3 marks

Outcomes 2 marks

11 – Introduction 2 marks

- @ of 6 mechanisms 2marks

Total 15 marks

- conclusion 1 mark