BIOLOGY PAPER 1
MARKING KEY
SECTION A (15%)

1.

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

[**10 items @ 01 mark**]

2.

(i)	(ii)	(iii)	(iv)	(v)
F	H	D	B	E

[**5 items @ 01 mark**]

SECTION B (60%)

3.(a) Comparison between photosynthesis and respiration

SITE: Photosynthesis takes place in chloroplast while respiration takes place in mitochondria

RAW MATERIALS: Photosynthesis needs carbon dioxide, water, light energy and chlorophyll
while respiration needs glucose and oxygen.

END PRODUCTS: Photosynthesis products are; glucose, water and oxygen while products od
respiration are; energy, carbon dioxide and water. [**3 points @ 01 mark**]

(b) (i) The part responsible for storage is LEAVES [**01 mark**]

(ii) SAPROPHYTIC NUTRITION: is the type of nutrition whereby organisms concerned,
feeds on dead organic matter. E.g. bacteria and fungi [**02 marks**]

[**TOTAL MARKS 06**]

4. (a) .**(a) mechanism of taking air in(inhalation or inspiration)**

- External intercostal muscle contract and the ribs pulled upwards and outwards.
  (**0.5 mark**)
- Diaphragm muscles contract and the diaphragm moves downward.(**0.5 mark**)
- The volume of the chest (thoracic cavity) increases(**0.5 mark**)
- *The pressure around the lungs decreases*
- The air is sucked in and inflates the alveoli.(**0.5 mark**)

Mechanism of taking air outside (exhalation or expiration)

- External intercostal muscles relax, the rib cage swings downwards and inwards (**0.5 mark**)
- The diaphragm muscle relax and become domed shape (**0.5 mark**)
- The volume of the thoracic cavity decreases (**0.5 mark**)
- *The pressure on lungs increases inside the chest*
- Air is exhaled and the alveoli collapse (**0.5 mark**)

(b) The left ventricle pumps blood to all parts of the body, thus there must be high pressure and therefore more muscles are needed to accomplish this task (and this is how the left ventricle is adapted for) whereby the right auricle only pumps blood (deoxygenated) to the lungs a shorter distance from the heart, here less pressure

needed and hence less muscles. [**2 points @ 01 mark**]
[**TOTAL MARKS 06**]

5.(a) The excess glucose in the blood is converted into glycogen by the hormone insulin and then stored in the liver and muscles. It can also metabolized into fats which is stored under the skin. [**02 marks**]
(b) (i) Touch response- THIGMOTROPISM
(ii) Root towards water- HYDROTROPISM
(iii) Root towards gravity-GEOTROPISM
(iv) Shoots towards light-PHOTOTROPISM [**4 points @ 01 mark**]
[**TOTAL MARKS 06**]

6.(a) Name: EUGLENA (**0.5 mark**)

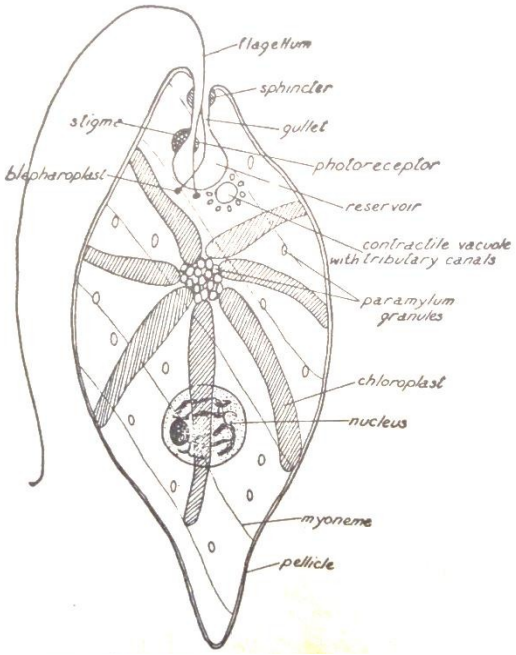


DIAGRAM OF

Diagram 0.5 mark
Caption 0.5 mark
Labeling 3 labels @ 0.5 mark

(b) (i) is to bring about movement of bones of the skeleton. When one muscle contract the
other relax this results to the movement of bones e.g biceps and triceps in the fore arm helps bending and straitening the arm. [**1.5 mark**]
(ii) Significance of excretion is to remove the waste products of the metabolism which
would otherwise interfere with the normal function of the body [**1.5 mark**]
[**TOTAL MARKS 06**]

7.(a) (i) Names of the cells A and B; A = Animal cell; B = Nerve cell (Motor neurone) [**01 mark**]
(ii) Names of structures; V = Chloroplast; W = Cell wall; X= Cytoplasm; Y = Nucleus
[**4 points @ 0.5 = 02 marks**]
(b) Functions of V, Y and Z

V = CHLOROPLAST: provide the site for photosynthesis, converts the solar energy by
aid of chlorophyll into chemical energy [**01 mark**]
Y = NUCLEUS: to control all biological processes carried by the cell / control all activities of the cell e.g cell division [**01 mark**]
Z = MYELIN SHEATH: to insulate the nerve fibres, facilitates the transmission of the
nerve impulses through the neurone [**01 mark**] [**TOTAL MARKS 06**]

8.(a) (i) Primary consumer
GRASSHOPPER or GOAT; because they all feed on grass (producers) (**01 mark**)
(ii) Secondary consumer
HEN / HUMAN / LIZARD they all feed on primary consumers (**01 mark**)
Hen feed on grasshopper ; Human feed on goat and Lizard feed on grasshopper
(iii) Prey and predator
HEN / LIZARD they feed on primary consumer and are eaten
Hen : feed on grasshopper(predator) and eaten by man / vulture (prey)
Lizard: feed on grasshopper (predator) and eaten by vulture (prey) (**01 mark**)
(b) food chains from the given food web;

- GRASS GRASSHOPPER LIZARD VULTURE
- DECAYING GRASS SNAIL HEN VULTURE
- GRASS GRASSHOPPER HEN VULTURE

[*any two food chains* @ **1.5 marks**]
[**TOTAL MARKS 06**]
9.(a) (i) Tissues responsible for transporting food are PHLOEM (**0.5 mark**) and the responsible for transporting water are XYLEM (**0.5 mark**)
(ii) differences

XYLEM TISSUES	PHLOEM TISSUES
Transport water and mineral salts from roots to the leaves and body of the plant	Transport food materials from the leaves to the roots and other parts of the plant
Consists of two kinds of conducting elements vessels and tracheids	Consists of elongated sieve tubes
Contains dead cells at maturity	It retains its protoplasm (do not contain dead cells)
Does not associate with companion cells	Associated with companion cells

(Two points each **01 mark**)
(b) (i) Hepatic artery: the blood in it is rich in oxygen as it carries oxygen from the dorsal aorta to the liver **while** hepatic vein: the blood in it is rich in digested food materials and carbon dioxide from the gut to the liver. [**1.5 marks**]
(ii) Systemic circulation is the movement (flow) of blood from the left ventricle to various parts of the body through aorta and back to the right auricle through vena cava **while** pulmonary circulation is the flow of blood from the right ventricle to the

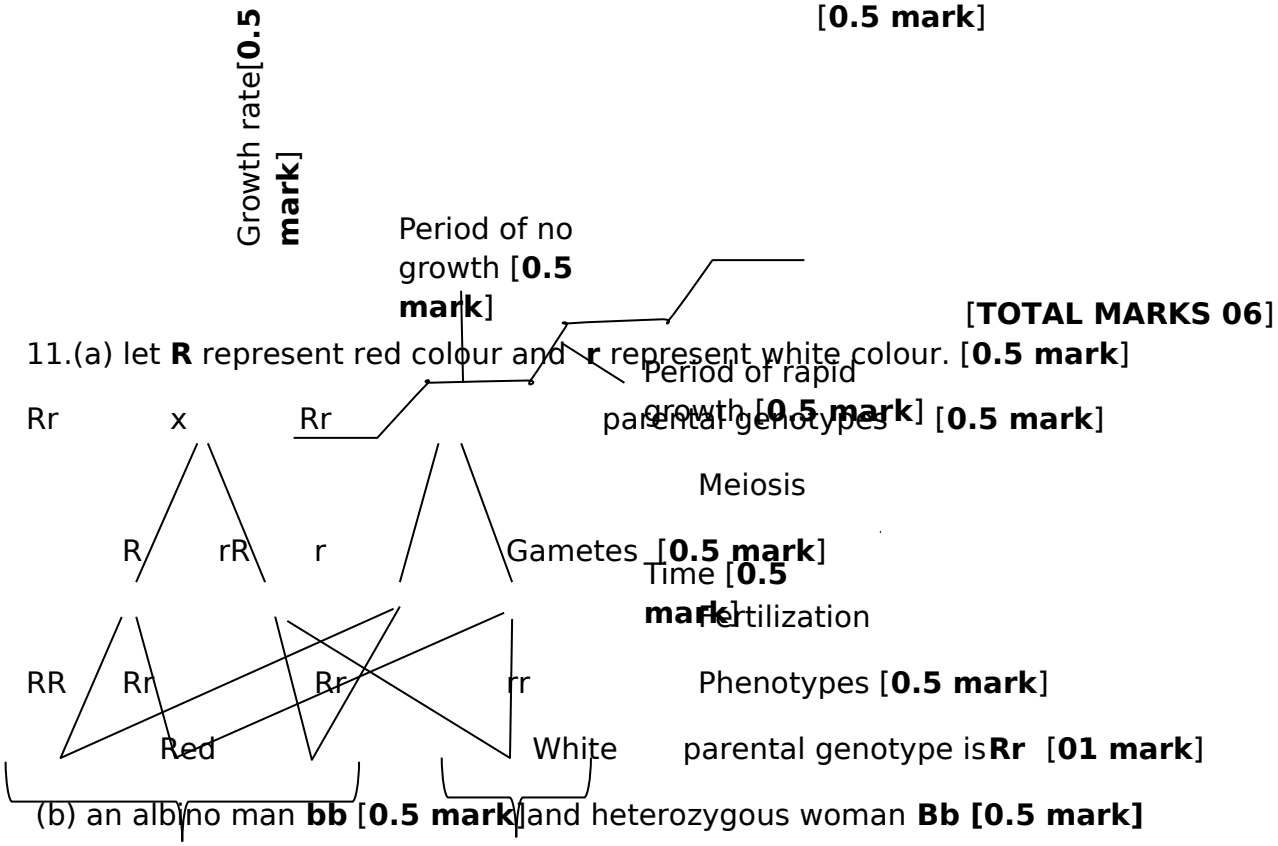
lungs through pulmonary artery and back to the heart through pulmonary vein. [**1.5 marks**] [**TOTAL MARKS 06**]

10.(a) (i) GROWTH: is the permanent increase in size acquired by an organism in the course of development, brought about as a result of cell expansion / the gradual increase in size of an animal or vegetable body over time [**01 mark**]

(ii) Internal factors which influence growth

- Hormones: somatotrophin induces growth in organism, if is in excess an organism becomes giant and if in small amount results to dwarfism. [**01 mark**]
- Genetic constitution: the inheritance of the various traits through genes which directs growth in organisms. [**01 mark**]

(b) GROWTH CURVE OF INSECTS [**0.5 mark**]



[**TOTAL MARKS 06**]

11.(a) let **R** represent red colour and **r** represent white colour. [**0.5 mark**]

Rr x Rr parental genotypes [**0.5 mark**]

Meiosis

R rR r Gametes [**0.5 mark**]

Fertilization

RR Rr Rr rr Phenotypes [**0.5 mark**]

Red White parental genotype is **Rr** [**01 mark**]

(b) an albino man **bb** [**0.5 mark**] and heterozygous woman **Bb [0.5 mark]**

Bb x bb parental genotypes

meiosis

B b b b gametes [**0.5 mark**]

fertilization

Bb Bb bb bb F_1 generation [**0.5 mark**]

Two albinos [**01 mark**] [**TOTAL 06 MARKS**]

12. (a) (i) Paleontology (Fossil record) [**01 mark**]
(ii) Comparative anatomy and morphology [**01 mark**]
(iii) Comparative embryology [**01 mark**]
(iv) Comparative physiology [**01 mark**]

(b) Over-reproduction increases the chances of survival for the members of species. This is because during struggle for existence some members fail to compete and some survive hence the species is not eliminated completely BUT if few offspring are produced the chance of the whole species to be eliminated increases. [**02 marks**] [**TOTAL 06 MARKS**]

SECTION C (25%)

13. Is the maintenance of healthful practices particular reference to cleanliness. That is *personal hygiene* and *environmental hygiene*.

- Body cleanliness: following different activities of the day man come into contact with many things, both living and non-living, these may be microbes and chemicals. Daily bathing (washing) is essential for removing such harmful substances from the body. The use of soap should be encouraged since soap kills some microbes and dissolve oily substances.
- Proper feeding habits: to maintain good health we need balanced diet, the kind and amount of food taken should relate to the need of different groups (e.g. babies, sick, elders) as well as the type of work done (e.g. sedentary, hard manual work)
- Uses of clean water: domestic water for drinking should be boiled and the one used for cooking must be clean and kept in clean utensils because if water is not clean can cause some diseases like typhoid and cholera which disturbs the state of our health.
- Cleanliness of the living surrounding: the houses should be kept clean by sweeping and moping the floor.
  The grass around our homes must be cut shot to minimize accidents as well keeping away mosquitoes which might transmit malaria.
  Each house should have a clean toilet and running water for washing hands after visiting the toilet.
  Each house should have either dust bin or pit where all rubbish is thrown in to minimize growth of microbes everywhere. [**15 marks**]

14. Cholera is a disease caused by bacteria called *Vibrio cholera*e. The bacteria is transmitted through contaminated water or food.

Symptoms of cholera include vomiting and diarrhea. The patient experience severe diarrhea and vomiting, the vomit and stool is whitish resembling that of rice water.
Due to severe vomiting and diarrhea the patient's body lose a lot of water and becomes dehydrated. The patient develops muscle cramps.
Precaution to be taken are; boiling drinking water, washing thoroughly all fruits and vegetables with clean water before they are eaten, hands must be washed with water and soap after visiting the toilet, clothing and beddings used by the cholera patient must be washed and sterilized before they can be used by another person. [**10 marks**]

15. Iron (Fe) is one of the essential mineral in human diet because it is an important constituent of hemoglobin (red pigment) of blood responsible for transporting oxygen from the lungs to other parts of the body.
If an individual miss this mineral in diet may suffer from ANAEMIA
The natural common sources of this mineral are; Beans, Meat (liver), eggs and green vegetables.
Iodine this is important in proper functioning of thyroid gland (secretion of thyroxin)
If an individual miss this in his/her diet may suffer from GOITRE
The natural common sources of this mineral are; Sea water, sea foods and iodized table salt. [**10 marks**]