SULIMO BIOLOGY PAPER 1 MARKING SCHEME

1. Name the taxonomic unit grouping that contains individuals with most similarities. (1mark)
   Species;
2. Give two rules of binomial nomenclature (2 marks)

   The name of the genus must start with a capital letter while that of the species is written in small letter;

   The two names should be italicized when printed or underlined separately when handwritten;
3. A marine amoeba does not burst when transferred into fresh water. Explain. (2 marks)

Amoeba has contractile vacuole which excretes excess water that gets into the body/cell by osmosis;

4. Explain what would happen to red blood cells if they are placed in a concentrated salt solution (2 marks)
   They lose water by osmosis; shrinks and becomes crenated;
5. Briefly describe the events of the dark stage of photosynthesis (2 marks)
   Carbon (IV)oxide is taken in through the stomata;
   The carbon (IV)oxide combines with the hydrogen atom from light stage to form glucose;
6. a) What characteristic of living organism is shown when;
   i. A cat produce kittens **Reproduction** (1 mark)
   ii. A girl drops a hot plate **Irritability** (1 mark)

   b) State the functions of the following cell organelles: (2 marks)
   i. Ribosomes; **Sites of protein synthesis**
   ii. Nucleus; **Controls all the activities of the cell;**
7. (a) State two ways in which the stomach is prevented from digestion by protein digesting enzymes (2 marks)

   They are secreted in inactive forms;

   Goblet cells in the stomach secrete mucus that lines the stomach lining preventing contact with digestive enzymes

a) Name two enzymes secreted in inactive form (2 marks)

Pepsin; Rennin; Trypsin

8. (a) Define the term ‘‘field of view’ ’as used in microscopy. (1 mark)

The circular lit area that is visible when you look through the microscope;

(b) State two functions of the body tube of a light microscope. (2 marks)

It supports the eyepiece and objective lenses;

It blocks stray light;

© Give a reason why it is not advisable to use water in cleaning a microscope (1 mark)

To prevent rusting;

To prevent reflection of light;

9. Explain why energy is lost from one trophic level to another (2 marks)

Energy lost as heat during respiration;

Egestion;

Excretion;

10. State the causative agents of the following diseases (2 marks)

a) Syphilis

Treponema pallidum;

b) Trichomoniasis

Trichomonas vaginalis;

11. During a 10000m race, a biological process took place in an athlete muscle as shown by the following equation:

$C_6H_{12}O_6 \longrightarrow$ substance **Z** + 145 KJ

a) What is the name of this process? (1 mark)

Anaerobic respiration;

b) Name the substance **Z** (1 mark)

Lactic acid;

c) How would the athlete body deal with accumulated substance **Z?** (2 marks)

Oxidized into CO2 and water;

Taken to the liver and converted into pyruvic acid/glycogen;

12.

a) State **two** factors that affect enzyme-controlled reaction (2 marks)

Temperature; Enzyme concentration;

pH;

b) State two properties of disaccharides (2 marks)

Soluble in water; Some have reducing property some don't; Sweet in taste;

13. State the roles of each of the following hormones in the process of reproduction in human male;

a) Follicle stimulating hormone. (1 mark)

Stimulates spermatogenesis;

b) Testosterone (1 mark)

Stimulates the development of male secondary characteristics;

14. What is the meaning of each of the following terms;

a) Deamination (1 mark)

The removal of amino group from amino acids;

b) Detoxification (1 mark)

Converting toxins into non toxic or less toxic substances from the body;

15.

a) What is cell specialization? (1 mark)

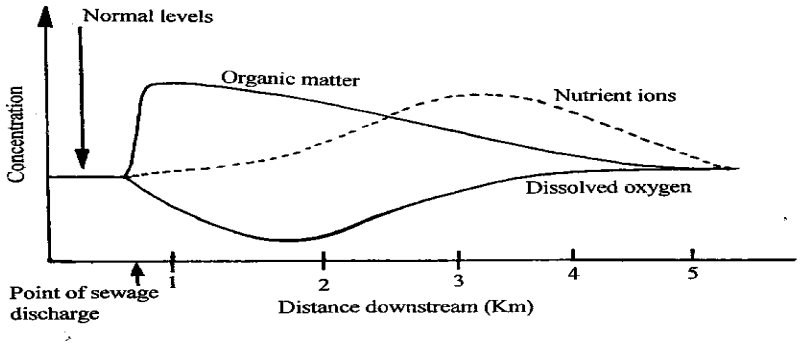
It is modification of the structure of a cell to perform specific functions;

b) Name the tissues that primarily protect plants and animals respectively against entry of pathogens and mechanical injury. (2 marks)

Epidermis in plants;

Epithelial in animals;

16. The figure below shows the changes in the concentration of various substances at Nairobi dam following the discharge domestic effluents from Kibera slams. Study it and answer the questions that follow.



a) Account for the changes in the concentration of:

i. Nutrient ions (2 marks)

The concentration increased then decreased; Increased due to decomposition of organic matter then decreased due to absorption of the nutrients by aquatic plants and decrease in organic matter being decomposed;

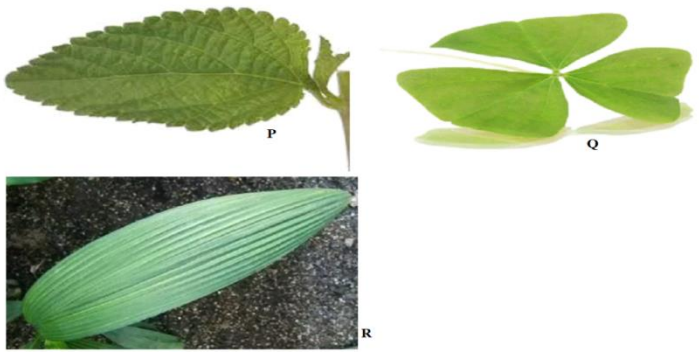
ii. Dissolved oxygen (2 marks)

The concentration decreased and then increased; the decrease was due to oxygen being used in decomposition of the organic matter, the increase was due to less decomposition due to reduced amount of organic matter;

b) What is the likely effect on the dam after the discharge of the effluents? (1 mark)

Eutrophication;

17. Below are diagrams of plant leaves P**, Q** and **R.** Construct a two-step dichotomous key which can be used to identify each of them. (3 marks)



1 a) Leaf simple…… go to 2

b) Leaf compound……Q;

2 a) Leaf parallel veined……R;

b) Leaf networked vein……P;

18. (a) Name one locomotory structure in unicellular organisms (1 mark)

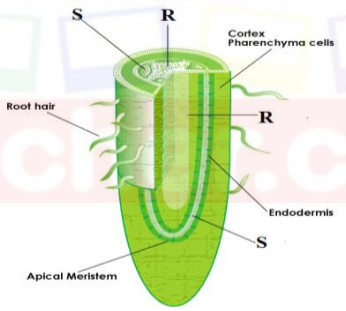
Cilia; Pseudopodia;Flagella;

(b) State two divisions of the plant kingdom with members that reproduce by means of spores (2 marks)

Bryophyta;

Pteridophyta;

19. The diagram below is a longitudinal section of a young root



a) Name the vascular tissues represented by letters **R** and **S** (2 marks)

R. Xylem;

S. Phloem;

b) State the roles of the tissue labelled R (2 marks)

Support;

Transports water and mineral ions from the roots to the rest of the plant;

c) Name a structure in the endodermis that enables it control root pressure (1 mark)

Casparian strip;

20.

a) State **two** functions of DNA molecule (2 marks)

Carry genetic material;

Direct protein synthesis;

b) What is DNA replication? (1 mark)

The process by which a cell creates an identical copy of its DNA;

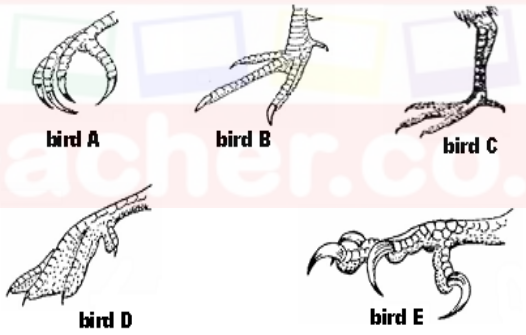
c) A DNA strand had the following base sequence

-T-A-C-G-C-T

What is the sequence of the m-RNA strand copied from this DNA portion? (1 mark)

A-U-G-C-G-A;

21. The figure below shows feet of various birds. Study the diagram and answer the questions that follow.



a) Name the type of evolution represented by the diagrams. (1 mark)

Divergent evolution;

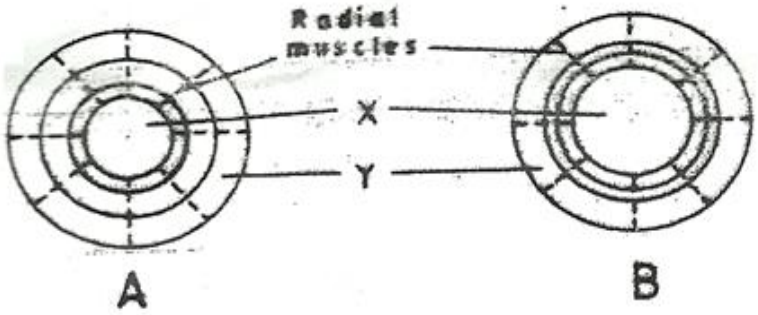
b) Give a reason for your answer in (i) above (1 mark)

The feet in birds are a homologous structure, hence have a common embryonic origin and have been modified to perform different functions;

c) Evolution is an ongoing process and is still going on even today. **State two** pieces of evidence which suggests that evolution is still taking place. (2 marks)

Industrial melanism; Existence of white and black papered moth; Resistance to pesticides; Resistance to Drugs e.g. antibiotics and chloroquine drugs; Resistance to herbicides; mark first 2

22. The diagram below shows how the iris and pupil of a human eye appear under different light conditions.



a) Name the structures labeled X and Y (2 marks)

X **Pupil;**

Y **Circular muscle;**

b) What is the significance of the change described from A to B. (1 mark)

Allow more light to enter the eye to enable one to see clearly in dimly lit place;

23. Explain how skeletal muscles bring about the movement at the elbow (3 marks)

Biceps contracts while triceps relax; to cause bending; triceps contracts while biceps relax to cause straightening of the arm;

24. The length from the tail tip to the anus of a certain tilapia fish is 12cm. The length from the tail tip to the mouth is 48cm. Calculate the tail power of the fish. Show all your working. (2 marks)

12/48*100; = 25%;

25. The petal cells of a certain plant have 32 chromosomes. State the number of chromosomes present in plants (2 marks)

a) Endosperm

48;

b) Egg cell

16;

26. The table below shows blood composition of Joab, Jane and Joan

Person	**Joab**	**Jane**	**Joan**
Red blood cells (mm^3)	8900	5000	3,100
White blood cells (mm^3)	4000	6,500	5,000
Platelets	230,000	220,000	550

a) Which person is likely to live at high altitudes (1 mark)

Joab;

Reason (1 mark)

High concentration of red bloods cells;

b) Which person's blood is likely to have an iron deficiency in his diet. (1 mark)

Joan;

27.

a) What is etiolation? (1 mark)

A process in which plants, due to insufficient light, grow tall and spindly with pale or yellow leaves;

b) What is the significance of etiolation? (2 marks)

To increase the likelihood of a seedling reaching a light source; enabling it to begin photosynthesis and become a self-sufficient plant;