**MARKING SCHEME BIOLOGY FORM 1**

1. a) Give two main branches of Biology. (2mks)
2. **Zoology**
3. **Botany**
4. **Microbiology**

b) Outline two precautions to take during collection and observation of

 specimens. (2mks)

* **Collect only the number of specimens needed to avoid wastage.**
* **Do not destroy the natural habitat of the specimens.**
* **Live specimens should be returned to their habitats.**
* **Dangerous specimens should be handled with care.**
1. State the kingdoms to which the following organisms belong. (3mks)
2. Plasmodium - **Protoctista**
3. Bat - **Animalia**
4. Yeast - **Fungi**
5. Name the most appropriate biological tool that an ecologist student can use for collecting:
6. grasshoppers from grass (1 mark)

**Sweep net**

(ii) Ants from a tree trunk (1 mark)

**Pooter**

1. Mangifera indica is the name given to a mango tree. What does each of the name represent?

Indica – **Genus** (1 mark)

Mangifera – **Specific** (1 mark)

(b) Name this method of identifying organisms. (1 mark)

**Binomial nomenclature**

1. (a) What do you understand by the term cell specialization as used in biology? (2 marks)

**This is where cells are modified to perform specific functions.**

(b) Name any two specialized cells in plants and state how each is modified.

Cell Modification (4 marks)

**(i) Palisade cells Contain Chlorophyll to trap light energy**

**(ii) Root Hair cell An extension**

 **(iii) Guard cells Chloroplasts, bean shaped**

1. The equation below represents a process that takes place in plants.

6CO2  + 6H2O C6H12O6 + 6O2

(Carbon IV) Oxide Water (Glucose) (Oxygen)

1. Name the process. (1mk)

**Photosynthesis**

1. State three conditions necessary for the process to take place. (3mks)
* **Presence of light**
* **Carbon IV Oxide**
* **Optimum temperature**
* **Water**
* **Chlorophyll**
1. State three ways in which leaves are adapted to carry out the process named in
2. Above efficiency (3mks)
* **Broad flat lamina to provide large surface area for absorption light and Carbon IV Oxide.**
* **Thin leaf for light and CO2 to pass through a short distance.**
* **Presence of stomata for efficient diffusion of Carbon IV Oxide.**
* **Transparent cuticle to allow penetration of light to cells.**
* **Veins conduct water and mineral.**
1. What is the role of light during the light stage of photosynthesis? (1mk)
* **Light energy is absorbed by Chlorophyll and is used to split water molecules into Oxygen + Hydrogen.**
* **Light energy is also converted to Chemical energy that is used in dark stage.**
1. The diagram below represents the lower jaw of a mammal.



1. Name the mode of nutrition of the mammal whose jaw is shown. (1mk)

**Holozoic Nutrition.**

1. Give reason for your answer in (a) above. (1mk)

**-Presence of teeth- shows feeds on solids.**

1. State one structural and one functional difference between the teeth labeled J and L. (2mks)

J

**Sharp edge**

**One root**

L

**Wide flat surface**

**Three roots.**

1. i) Name the toothless gap labeled K. (1mk)

**diastema**

1. State the function of the gap.

**Allows the tongue space for turning and moving food materials.**

1. Name the substance that is responsible for hardening of teeth. (1mk)

**Enamel**

1. Name two dental hygiene practices. (2mks)
* **Regular brushing of teeth after every meal.**
* **Eating diet rich in calcium, phosphates**
* **Eating hard food**
* **Use teeth for the proper function**
1. List two dental diseases. (2mks)
* **Dental carries**
* **Periodontal disease.**
1. Define the following terms. (3mks)
2. Ingestion

**Introduction of food into mouth**

1. Digestion

**Breakdown of complex food substances into simple soluble substances that can be absorbed into the body**

1. Egestion

**Removal of undigested and indigestible food materials from the \*\*.**

1. Name two salivary glands in humans. (2mks)
* **Sublingual salivary glands**
* **Sub-mandibular salivary glands**
* **Parotid salivary glands**

ii) State two functions of saliva. (2mks)

* **Contains salivary amylase that digest starch**
* **Saliva is alkaline that provides optimum PH for enzyme.**
* **Has mucus that lubricates food hence smooth flow.**
1. Name two nutrients that are absorbed without being digested by enzymes in humans.(2mks)
* **Water**
* **Vitamins**
* **Mineral salts.**
1. State the functions of the following enzymes (4mks)
2. Salivary amylase

**Digest starch to maltose**

1. Pepsin

**Digest proteins to peptides**

1. Rennin

**Digest protein caseinogens to casein**

1. Pancreatic lipase

**Digest lipids to fattyacids and glycerol.**

1. State two functions of hydrochloric acid produced at the stomach. (2mks)

**Provides acidic medium optimum for enzyme in the stomach.**

1. State two functions of the bile juice in the digestion of food. (2mks)
* **Neutralizes acidic chyme**
* **Emulsifies fats/lipids**
* **Provides alkaline medium**
1. List four adaptations of ileum to its functions. (4mks)
* **Long to provide large surface area absorption**
* **Narrow to bring digested food into close contact**
* **Highly coiled to slow down movement of chyle to allow more time for absorption.**
* **Inner surface has villi & micro-villi to increase surface area of contact for absorption.**
* **Thin layer of cells through which digested food diffuses.**
1. Give the name given to the study of:-
2. Inheritance and variation (1mk)

**Genetics**

1. Insects (1mk)

**Entomology**

1. State the function of the following cell organelles
2. Ribosome (1mk)

**Site for protein synthesis**

1. Lysosome (1mk)

**Breakdown of worn out organelles**

1. State the functions of the following parts of a light microscope.
2. Objective lens (1mk)

**Magnifies the specimen**

1. Diaphragm (1mk)

**Regulates amount of light passing through to the specimen.**

1. a) State two properties of monosaccharide. (2mks)
* **sweet taste**
* **soluble in water**
1. What is the main function of monosaccharide in organisms? (1mk)

**Provision of energy.**

1. State the formula for calculating magnification when using the following
2. Hand lens/naked eyes (1mk)

$$Mg=\frac{drawing length of object}{actual length of the object}$$

1. A light microscopic. (1mk)

**Objective lens magnification x eye piece lens magnification**

1. Explain why a mule, a product of mating between a horse and a donkey is sterile. (1mk)

**Are not of the same species.**

1. Name the taxonomic unit with:
2. The greatest number of organism. (1mk)

**Kingdom**

1. With the least number of organisms. (1mk)

**Species**

1. What name is given to the process whereby :
2. Red blood cells wrinkle after losing their water to a hypertonic solution?(1mk)

**Crenation**

1. Plant cells become flaccid after losing their water to a hypertonic solution?(1mk)

**Plasmolysis**

1. The figure below shows a small piece of visking tubing which is filled with potassium permanganate solution. Its free ends were tied tightly to prevent leakage .It was then dipped in a beaker full of distilled water. The set up was left for 2 hours .Its was observed that the distilled water was coloured purple.



1. What physiological process was being investigated.(1mk)

**Diffusion**

1. Account for the observation made in (a) above.(3mks)

**The molecules of potassium permanganate moved from where they were highly concentrated in the visking tubing to the distilled water where they were lowly concentrated through diffusion.**

1. State three factors that affect the rate of diffusion (3mks)

**Temperature**

**Surface area to volume ratio**

**Surface area**

**Thickness of the membrane**

**Type of medium**

1. What does a semi-permeable membrane correspond to in an animal cell? (1mk)

**Cell membrane**

1. The cells shown below were obtained from two different plant cells which were immersed in 25% and 2% salt solution.



1. Which of the two cells A and B was immersed in; (2mks)
2. 25% salt solution………………………………………………**A**
3. 2% salt solution………………………………………………..**B**
4. Comment on the cell placed in 25% salt solution (2mks)

**The cell placed in 25% salt solution lost water through osmosis & it became flaccid as the 25% salt solution was Hypertonic to the cell cap of the plant cell.**

1. What biological process was being investigated (1mk)

**Osmosis**

1. 



1. Identify the organelle (1mk)

**Chloroplast**

1. State the function of the organelle (1mk)

**Site for photosynthesis**

1. i) Name the part labeled N (1mk)

**Stroma**

ii) Name the chemical compound contained in the structure labeled M. (1mk)

**Chlorophyll**

1. a) Classify the following carbohydrates into monosaccharides, disaccharides and polysaccharides:

Starch, sucrose, maltose, fructose, glucose, and cellulose. (3mks)

|  |  |  |
| --- | --- | --- |
| **Monosaccharides** | **Disaccharides** | **Polysaccharides** |
| **Glucose****Fructose** | **Sucrose****Maltose** | **Starch****Cellulose**  |

1. What are the names given to the types of reactions shown in (i) and (ii) below? (2mks)
2. C2H12O6 + C2H12O6 C12H22O11 +H2O

Glucose fructose sucrose water

**Condensation**

1. C12H22O11 + H2O C6H12O6  + C6H12O6

Sucrose water glucose fructose

**Hydrolysis**

1. The apparatus shown below is used to investigate an aspect of photosynthesis. Examine it carefully and answer the questions that follow.



1. What aspect of photosynthesis is being investigated? (1mk)

**To show oxygen is released during photosynthesis.**

1. How can you verify the identity of the gas that accumulates in the test tube? (1mk)

**By inserting a glowing splint which should burst into flames.**

1. What is the role of sodium hydrogen carbonate? (1mk)

**To release Carbon (IV) Oxide**

1. What environmental factors are required in order to get a positive result? (2mks)

**Adequate temperature**

**Light**