

BIOLOGY FORM ONE TERM 3 YEAR 2023

NAME.....ADM.NO.....CLASS.....

INSTRUCTIONS

- *Write your name and admission number in the spaces provided.*
- *Answer all questions in the space provided*
- *This paper consists of all printed pages and ensure no blank pages.*



1. Differentiate between Botany and Zoology (2 mks)
- **Botany – study of plants**
 - **Zoology – study of animals**
- (mark as whole)

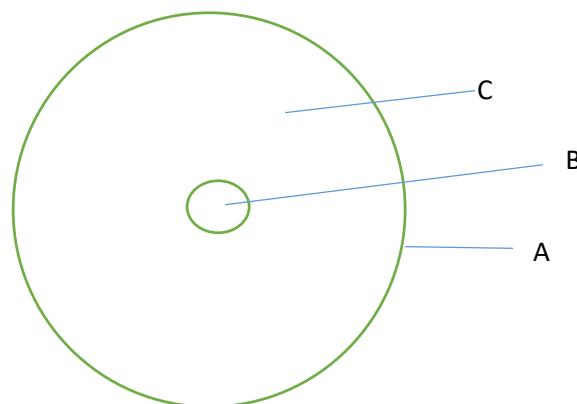
2. Motor vehicle move, use energy and produce carbon iv oxide and water similar characteristics occur in living organisms yet motor vehicles are not classified as living organism. Explain (3 mks)
- **Growth and development**
 - **Reproduction**
 - **Irritability**

3. List skills that are gained on studying Biology (3 mks)
- **Observing**
 - **Identifying**
 - **Recording**
 - **Measuring**
 - **Classifying, analyzing and evaluating data**

4. Give three difference between the light and electron microscopes (3 mks)
- | | |
|------------------|---------------------|
| Light microscope | Electron microscope |
|------------------|---------------------|

- | | |
|--|--|
| <ul style="list-style-type: none"> - Has low magnification power - Has low resolving power - Uses glass lenses for magnification - Uses light to illuminate the specimen - Specimens are stained using normal dyes | <ul style="list-style-type: none"> - Has very high magnification power - Has very high resolving power - Uses electromagnetic lenses for magnification - Uses a beam of electrons to illuminate specimen - Specimens are stained using complex |
|--|--|

-Stains (dyes containing heavy metals)



5. The diagram above was obtained from a certain organism. (1 mk)
- i) Identify the structure
- **Animal cell**

- ii) Which type of microscope was used to view the structure (1 mk)
 - **Light microscope**
 Name the parts labelled (2 mks)
B Nucleus
C Cytoplasm
- iii) State the function of the part labelled A (2 mks)
 - **Encloses the cell content**
 - **Regulate the movement of materials in and out of the cell**
6. State the functions of the following parts of a light microscope
 a) Diaphragm - **Regulates the amount of light passing through the condenser** (1 mk)
 b) Objective lens - **Magnifies the image of the specimen** (1 mk)
7. Explain the importance of doing the following when testing a leaf for starch (4 mks)
 i) Boiling the leaf – in water
 - **To kill the leaf cells so as to stop cellular functions**
 - **To break the starch granules so as to release starch**
 ii) Boiling the leaf in methylyated spirit - **To decolourise the leaf**
 iii) Boiling the methylyated spirit in water bath- **Methylyated spirit is highly flammable and this is a precautionary measure.**
 iv) Placing a potted plant in the sun for 5 hours- To photosynthesis leading to formation of starch
8. Describe what happens during the light stage of photosynthesis (3 mks)
 - **During this process the light absorbed by chlorophyl molecule is used to split water(photolysis) molecules into oxygen and hydrogen atoms**
 - **The hydrogen atoms produced by the splitting of water enter the dark stage**
 - **O₂ is released to the atmosphere some is used by the plant for respiration**
 - **Formation of energy rich Adenosine is Triphosphate**
 - **Accept a well balanced equation ($2H_2O \xrightarrow[\text{Chlorophyl}]{\text{Sunlight}} 4H + O_2 + ATP$)**
9. Explain **two** factors that affect enzymatic activities (2 mks)
 - **Temperature**
 - **Substrate concentration and enzyme concentrated**
 - **Enzyme co-factors and co-enzymes**
 - **Enzyme inhibitors**
10. State a function of the large intestine in humans (1 mk)
 - **Reabsorption of water**
11. State the role of
 i) Vitamin C in human (1 mk)
 - **Protection against infection**
 - **It is an antioxidant**
 - **Aids in detoxification**
 ii) Iron in humans (1 mk)

- *Involved in formation of haemoglobin in R.B.C*

12. State two roles of **HCL** in the stomach (2 mks)

- *Provide an acidic medium suitable for action of pepsin/renin*
- *Activates the inactive forms of enzymes*
- *Kills bacteria that may be present in food*

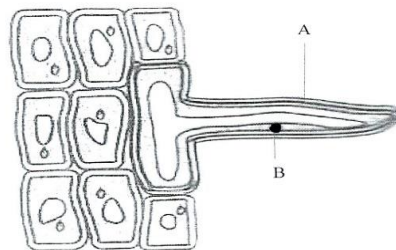
13. a) Complete the table given below (3 mks)

Eye –piece lens magnification	Objective lens magnification	Total magnification
X 5	X4	X20
X 10	X5	X50
X10	X10	X100

i) State **four** activities of the cell that are controlled by nucleus (4 mks)

- *Cell division*
- *Protein synthesis*
- *Cell respiration*
- *Cell secretion*
- *Excretion*
- *Cell growth*

b) Identify the specialized cell illustrated in the diagram below. (1 mk)



Root hair cell

- ii) Name the parts labelled (2 mks)
A-Root hair

B- Nucleus

- iii) Name two other specialized cells and in each case explain how they are modified to perform their functions efficiently (4 mks)

- **Red blood cell – Biconcaved shape and lack nucleus to maximize surface area for oxygen absorption**

Contains haemoglobin, that transport oxygen

Flexible and elastic to squeeze through capillaries

- **Sperm cell – Head contains lytic enzymes to help penetrate the ovum’s membrane**

Long tail enables swimming

- iv) What is Binomial nomenclature (1 mk)

- **Double naming of organisms where the organism is given generic and specific name**

14. Name the organelles that would be found in large numbers in cells of a:

- i) Rapidly respiring tissue (1 mk)

- **Mitochondria**

- ii) Secretory gland (1 mk)

- **Golgi bodies**

15. State the function of each of the following tissues

- i) Meristematic (1 mk)

- Cell division and growth

- ii) Blood (1 mk)

- **Transport respiratory gases**

- **White blood cell protect the body against infection of pathogenic organisms**

- **Plasma regulates blood PH**

16. Differentiate between plasmolysis and crenation (2 mks)

- **Plasmolysis is the process by which plants cells lose water and become flaccid when it is placed in hypertonic solution**

- **Crenation is the shrinking of an animal cell when placed in hypertonic solution**

17. The scientific name of an onion is **Allium cepa** Identify the genus and the species to which the organism belongs (2 mks)

- a) Genus-**Allium**

Species-**Cepa**

- b) Outline three functions of carbohydrate in living organism (3 mks)

- **Source of energy**

- **Storage forms of food**

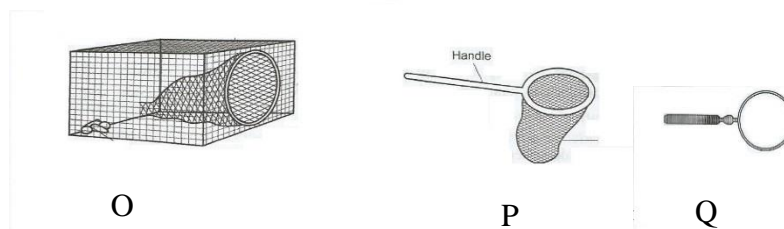
- **Components of structures that provide mechanical support in organs**

- c) What are the building blocks of proteins (1 mk)
-Amino acids
- d) Give **two** factors that determine energy requirement in human beings (2 mks)
- Basal metabolic rate (B.M.R) – sex
- Everyday activity/occupation – lactation and pregnancy
- Age
- Body size
- e) Name the monosaccharides that make up the following substances
- i) Sucrose- *Glucose +Fructose* (1 mk)
- ii) Lactose – *Glucose + Glucose* (1 mk)

18. The table below shows the number of teeth in the jaws of an animal

	Canines	Incisors	Premola	Molars
Upper jaw	0	0	6	4
Lower jaw	8	0	6	6

- a) Write the dental formula of the organism (1 mk)
 $2(i \frac{0}{4} C \frac{0}{0} pm \frac{3}{3} M \frac{2}{3}) = 30$
- b) i) State the mode of feeding of this animal (1 mk)
- Herbivorous
- iii) Give **two** reasons for your answer (2 mks)
- Have diastema gap
- Have a horny pad
- iv) Name **two** dental diseases (2 mks)
- Periodental diseases
- Dental carriers
- v) The diagrams below represents common equipment used by Biologists



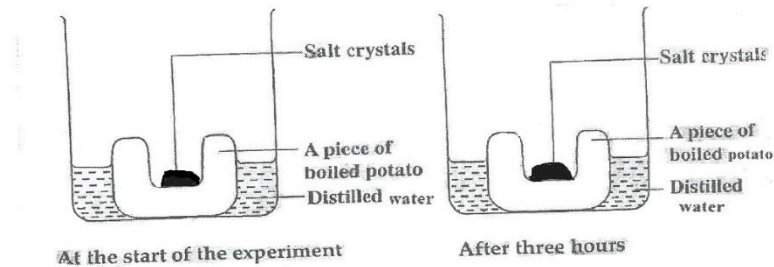
- a) Identify the equipment
- O-Bait trap** (1 mk)
- P- Sweep net** (1 mk)
- Q – Hand lens** (1 mk)

19. a) Give the uses of the following apparatus (2 mks)
- i) Specimen bottle
 - ***Keeping collected specimen***
 - ii) Pooter
 - ***Sucking small animals from rock surface/bark of trees***
- b) State **two** necessary precautions to be observed when collecting specimens (3 mks)
- ***Collect only the number of specimens needed to avoid waste***
 - ***Do not harm specimens during collection exercises***
 - ***Do not destroy the natural habitat of the specimens***
- c) Name the carbohydrate that is
- i) Stored in plant seeds (1 mk)
 - ***Starch***
 - ii) Stored in mammalian muscles (1 mk)
 - ***Glycogen***
 - iii) Most abundant in human blood (1 mk)
 - ***Glucose***

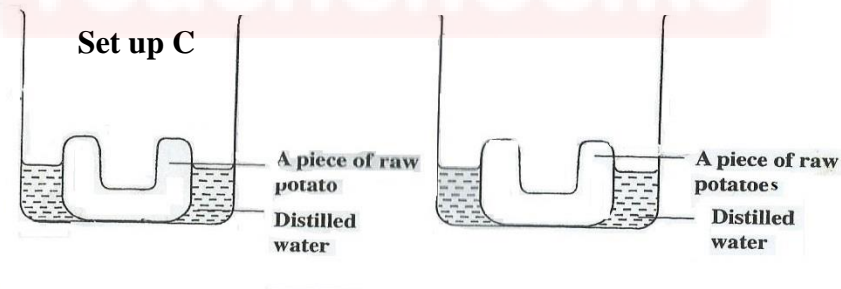
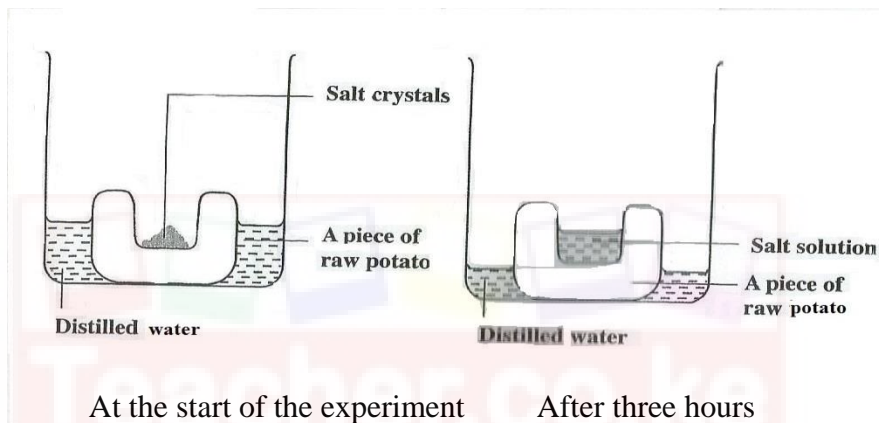


20. A group of students set up the experiment below to investigate a certain physiological process

Set up A



Set up B



- i) Name the physiological process being investigated (1 mk)
- **Osmosis**
- ii) Account for the results in set-up A and B
A- There is no change on salt crystals because osmosis did not take place.
Boiling kills the cells destroying the cell membrane
B- Water moves from cells of the potato into the cavity containing salt crystals by osmosis, the cells become hypertonic and drew water from petri dish by osmosis

- iii) What was the purpose of set-up C? (1 mk)
- ***To act as a control experiment***
21. Name two structures found in plant cells that are absent in an animal cell (2 mks)
- ***Cell wall***
- ***Chloroplast***
- ***Large sap vacuole***
- ***Tonoplast***
- a) Define active transport
- ***It is the movement of molecules across cell membrane against concentration gradient***
- b) What is the significance of active transport in living organisms
- ***Absorption of the products of digestion from the ileum into the bloodstream***
- ***Excretion of waste products from body cell into the surrounding medium***
- ***Absorption of mineral salt from the soil by the root hair cells***
- ***Selective reabsorption of certain substances in the kidney such as glucose and salt***

