

NAME.....MARKING SCHEME.....CLASS.....ADM. NO.....  
SIGN.....

231/1  
BIOLOGY  
PAPER 1  
SEPTEMBER, 2021  
TIME: 2 HOURS

# MOMALICHE BIOLOGY P1 MS

*(Kenya Certificate of Secondary Education)*

## Instructions to candidates

- Write your name, class and admission number in the space provided above.
- Write the date of the examination and sign in the space provided above.
- Answer *all* the questions in the spaces provided.
- You may be *penalized* for wrong spelling especially technical terms.

### For Examiner's Use Only

Question	Maximum Score	Candidate's Score
1-25	80	

*This paper consists of 11 printed pages. Candidates should check the question paper to ascertain that all the pages are printed as indicated and no questions are missing*

1. (a) Name the branch of biology that deals with the study of the following:- (2mks)

- (i) Fungi .....***Mycology;***
- (ii) Insects .....***Entomology;***

(b) Suggest the names of the treaties that were signed and enacted into law to- (2mks)

i) Fight depletion of Ozone layer

•***Kyoto protocol;***

ii) Manage natural resources e.g. prohibiting poaching of wild animals

•***Convention against International Trade of Endangered Species;***

***Accept : CITES***

2. In an experiment, it was observed that when maggots are exposed to light, they move to dark areas. On the other hand , Euglena and Chlamydomonas move towards light.

(a) Name the type of response exhibited by the organisms (1mk)

•***Phototactic/ Phototaxis/ Phototaxism;***

(b) State one advantage of the response shown by Euglena and Chlamydomonas.

(1mk)

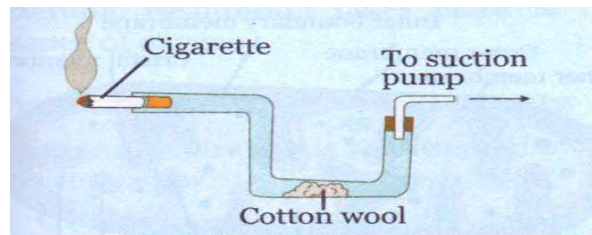
•***To trap light energy for use in photosynthesis;***

3. Plant leaf was placed between two pieces of cobalt chloride paper before being held by two glass slides. Explain the expected observation after several hours in the sun.

(3mks)

- Cobalt chloride paper on the lower side turned pink; faster than the one on the upper side;
- It indicates there are more stomata on the lower side than the upper side;

4. The figure below shows the apparatus used for collecting some of the substances in cigarette smoke. As the cigarette burns the cotton wool turns brown.



(a) Name the substance that causes the cotton wool to change its colour. (1mk)

*Tar;*

(b) The cotton wool provides a large surface area on which this substance collects . what structures in the lungs does the cotton wool represent. (1mk)

•*Alveoli/air sacs;*

(c) Explain how smoking affects the amount of oxygen taken up by the blood.(3mks)

•*Smoke deposits tar; that distorts the alveoli thus impeding / blocking gaseous exchange; Smoke contain Carbon (ii) Oxide that forms Carboxyhaemoglobin that does not;*

•*Dissociate even in presence of oxygen; thus reduces the amount of oxygen transported;*

5. Name three tissues responsible for secondary growth in flowering plants. (3mks)

•*Vascular cambium;*

- Cork cambium;
- Intercalary meristem;

6. Study the diagram below and answer the questions that follow:



- a) State the class of the organism shown above. (1mk)  
 •Chilopoda;
- b) Give three reasons for your answer in 6 (a) above. (3mks)  
 •One pair of legs per segment;  
 •Dorso-ventrally flattened body;  
 •One pair of antennae;  
 •One pair of poisonous claws;

7. Give three reasons why plant have not evolved complex excretory organs. (3mks)

- Have lower rates of metabolism;
- Excrete non-poisonous products of carbohydrate metabolism unlike the toxic products of protein metabolism in animals;
- Plants re-use some of their metabolic wastes;
- Plants store some of their metabolic wastes in roots, fruits and leaves;

8. a) Name two substances in the human blood that are required for the process of photosynthesis. (2mks)

- Carbon (IV) oxide;
- Water;

9. Give the structural difference between mitochondrion and chloroplast. (2mks)

•*Mitochondrion has cristae whereas chloroplast has thylakoid discs;*

•

10. Give three ways in which the pollen of insect pollinated flowers differs from the pollen of wind pollinated flowers. (3mks)

Insect pollinated	Wind pollinated
<i>Large</i>	<i>Small</i>
<i>Few</i>	<i>Many</i>
<i>Heavy</i>	<i>Light</i>
<i>Sticky surface</i>	<i>Smooth surface</i>

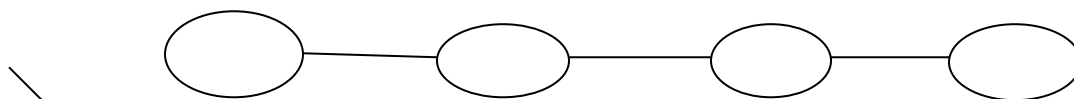
11. Name two organelles that would be abundantly present in secretory cells. (2mks)

•*Endoplasmic reticula;*

•*Golgi apparatus;*

•*Mitochondria;*

12. The diagram below shows part of a starch molecule

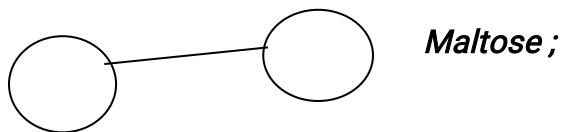


(a) State what the circles and the lines joining them represent:- (2mks)

(i) Circles .....*Glucose molecules;*

(ii) Lines .....*Glycosidic bonds;*

(b) Show diagrammatically and name the product when the enzyme Amylase has an effect on this molecule (1mk)



13. Two farmers prepared fish ponds and introduced equal number of fish in each pond. The fish in one of the farmer's pond died within two days after being introduced into the pond while those of the other survived. On examining the ponds, one was found to be full of Algae and the other had no Algae.

(a) In which of the ponds were the Algae present? (1mk)

**•The pond where the fish survived / did not die;**

(b) Suggest the possible reason for the death of the fish (1mk)

**•Inadequate oxygen for their respiration;**

(c) State two importances of Algae and other water plants to fish (2mks)

- **Replenishes the air by taking in carbon (iv) oxide and releasing oxygen during photosynthesis;**
- **Provides food for the fish ;**
- **Provide shelter for the fish ;**
- **Breeding site for fish ;**

14. Why is it not advisable to wash vegetables after cutting them into small pieces.

(2mks)

**•Leads to lose of water soluble vitamins and minerals; due to increased surface area;**

15. Give three roles of gibberellins in plants. (3mks)

- Breaks seed dormancy;*
- Promote stem elongation;*
- Promote leaf growth;*
- Promote fruit formation;*
- Enhances the action of auxins*

16. What is the fate of excess amino acids in the human body. (3mks)

•*Deaminated in the liver; where amino group is converted to ammonia which combines with Carbon (iv) Oxide to form urea; Carboxyl group is converted to glucose which is oxidized to produce energy or glycogen for storage in the liver;*

17. Give reasons for each of the following statements:-

(a) Constant body temperature is maintained in the body (2mks)

•*Most enzymes in the body work within a narrow range of temperature; high temperatures denature enzymes and low temperatures inactivate enzymes;*

(b) Low blood sugar is harmful to the body. (2mks)

•*Sugar is a raw material for respiration; hence low sugar levels leads to low rate of respiration leading to less energy available to the body/low rate of metabolism;*

18. How is the mammalian fallopian tube adapted to its function? (2mks)

- *Ciliated epithelium to push/propel the fertilized egg towards uterus;*
- *Muscular wall to propel the fertilized egg;*
- *Funnel shaped end to capture the ovulated egg;*

19. a) State three ways in which *Homo sapiens* differ from *Homo habilis*. (3mks)

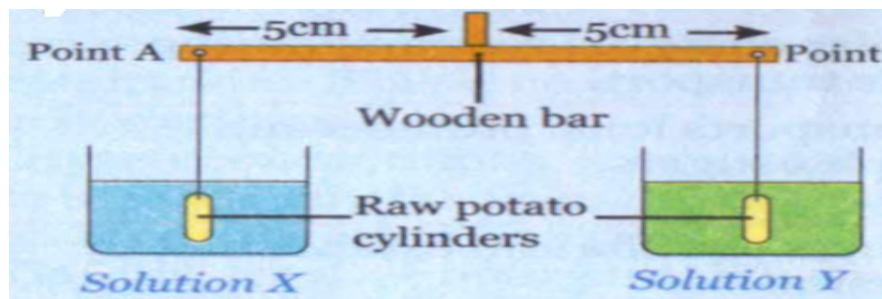
Homo sapiens	Homo habilis
<i>Standing / upright / erect posture;</i>	<i>Stooped posture / less upright;</i>
<i>Communicate through speech;</i>	<i>Speech absent but had a form of communication;</i>
<i>High / bigger intellectual capacity;</i>	<i>Low intellectual capacity;</i>
<i>Larger brain capacity;</i>	<i>Smaller brain capacity;</i>

b) Distinguish between homologous and analogous structures. (2mks)

•*Homologous structures are those that have common embryonic origin but have been modified to perform different functions;*

•*Analogous structures are those that different embryonic origin but have been modified to perform similar functions;*

20. The diagram below represents a set-up used to investigate a certain biological process in plants. After seven hours the wooden bar was found to be tilting downwards at point A.



a) Suggest the nature of solution X and Y. (2mks)

X..... *Hypotonic;*

Y.....*Hypertonic;*

b) Give an explanation on the tilting of the wooden bar downwards at point A.(3mks)

•*Solution X is hypotonic to the cell sap of cells in the potato cylinders ; water*



*molecules moved in to the cells of the potato cylinders by osmosis; thus making the cylinder in solution X heavier than cylinders in solution Y hence the tilting;*

21. A potometer can be used to measure the rates of transpiration and water uptake.

Which of the two can be measured in the following manner? (2mks)

(i) Directly.

*•Rate of water uptake;*

(ii) Indirectly.

*•Rate of transpiration;*

22. A set of triplets were separated at birth and were brought up under different conditions. The table below gives information about them when they met after 18years.

Character	James	John	Jacob
Weight	71kg	70kg	65kg
Height	1.82M	1.85m	1.75m
I.Q	124	124	123
Blood group	A	O	A

a) Which of the triplets could have been identical. (1mk)

*James and Jacob ;*

b) Give a reason for your answer. (1mk)

*•Both have same blood group which can not be changed by environmental conditions;*

23. (a) State two regions within a cell where the second phase of respiration occurs.

(2mks)

• **Cell cytoplasm ;**

• **Matrix of mitochondria ;**

c) Give two uses of energy released during respiration.

(2mks)

• **Cell division ;**

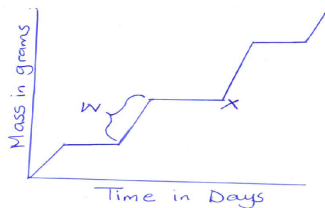
• **Secretion of substances ;**

• **Transmission of nerve impulses ;**

• **Muscle contraction during movement ;**

• **Re-absorption of substances in the kidney ;**

24. The graph below represents the growth of animals in a certain phylum



(a) Name the type of growth pattern shown on the graph.

(1mk)

**Intermittent growth pattern ;**

(b) Identify the process marked X.

(1mk)

**Moulting / Ecdysis ;**

(c) Name the hormone secreted by the neurosecretory cells in the brain which stimulates the production of the hormone responsible for the process in (b) above.

(1mk)

•*Moulting stimulating hormone ;*

•*Prothoracicotropic hormone ;*

25. Give three reasons as to why biological control is preferred to chemical control in the control of pests and parasites. (3mks)

- *No resistance is developed ;*
- *No pollution of soil , water and air ;*
- *No poisoning of human beings and other animals ;*
- *Vital microbes such as fungi and some bacteria that are decomposers are not killed as with chemical control ;*