# BIOLOGY PP1 2024 KCSE MOCK

## TOP RANK KCSE PREDICTION MOCK 2024 SERIES

**TOPLIGHT PUBLISHERS KENYA 2024 PANELKCSE PROJECTION WORKS**

**WE HAVE ALL SUBJECTS REACH US 0729 125 181 TO HAVE YOUR SUBJECT**


- **FOR QUESTIONS IN WORD AND MARKING SCHEME CALL SIR ABRAHAM 0729125181**
- **N/B;WE DON'T OFFER FREE MARKING SCHEME**
- **ALL PAYMENTS SHOULD BE PAID TO OUR TILL NO :8264076**
- **EMAIL US; toplightpublisherskenya@gmail.com**

**NAME**_____ **INDEX NO.**_____

**DATE**_____ **ADM**_____

**DATE.**_____ **SIGN**_____ **TARGET**_____

**BIOLOGY 231/1**

**2 HOURS** **SERIES 1 2024 KCSE MOCK**

**FORM 4**

**INSTRUCTIONS TO CANDIDATES**

- *Write your **name, Index number and name of your school** in the spaces provided above*
- ***Sign** and write the **date** of examination in the spaces provided.*
- *Answer **all** the questions in the spaces provided.*
- ***This paper consists of 8 printed pages.***
- ***Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing***

**FOR EXAMINERS USE ONLY**

| QUESTIONS | MAXIMUM SCORES | CANDIDATE'S SCORE |
|---|---|---|
| 1 – 31 | 80 | |
| | | |

1. a) Name the causative agents of the following diseases in humans.

i) Typhoid. (1mk)

……

……..……

……

ii) Amoebic dysentery. (1mk)

……

……..……

……

2. State the function of the following cell organelles.

i) Ribosome. (1mk)

……

……..……

……

ii) Lysosomes (1mk)

……

……..……

……

iii) Nucleolus. (1mk)

……

……..……

……

3. a) Name **one** defect of the circulatory system in humans. (1mk)

……

……..……

……

b) State **three** functions of blood other than transport. (3mks)

……

……

……

4. a) Distinguish between epigeal and hypogeal germination in plants. (2mks)

……

……

……

b) Name the gland that secretes the following hormones. (2mks)

i) Ecdysone

……

……

……

ii) Juvenile

……

……

……

5. a) Give two sex linked genes found on the Y-chromosome. (2mks)

……

……

……

b) Below is a nucleotide strand

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

i) Identify the type of nucleic acid. (1mk)

……

……

……

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

……

……

……

6. a) Distinguish between homologous and analogous structures. (2mks)

……

……

……

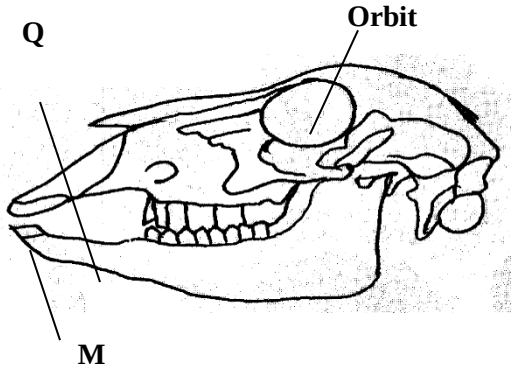
b) Give **one** reason why organisms become resistant to drugs. (1mk)

……

……

……

7. The following specimen was extracted from a newly discovered organism.




a) Name the tooth labeled **M**. (1mk)

……

……

……

b) Name the part labeled Q and state its role.
(2mks)

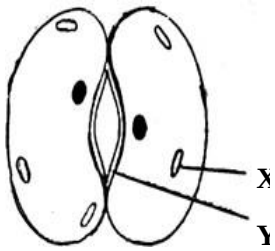
Name……

Role

……

……

8. The diagram below represents a cell organelle




a) Name the part labeled Y. (1mk)

……

……..……

……

b) State the function of the part labeled X. (1mk)

……

……..……

……

c) Explain how dark stage of photosynthesis is dependent on the light stage (2mks)

……

……..……

……

9. a) Name **two** gaseous exchange surfaces in plants. (2mks)

……

……..……

……

b) What is the importance counter current flow system in fish? (2mks)

……

……..……

……

10. Form three students wanted to estimate the population in $5km^2$ grass field near a school compound. They captured 36 grass hoppers and marked them before

returning them to the field. After a few days they made another catch of grasshoppers. They collected 45 grasshoppers out of which only 4 had marks.

a) Name the method of population estimation the students used. (1mk)

……

……..……

……

b) State **two** assumptions that were made by the students during the study. (2mks)

……

……..……

……

c) From the data, calculate the population size of grasshopper. (2mks)

……

……..……

……

11. State the functions of the following parts. (2mks)

i) a) Endometrium

……

……..……

……

b) Epididymis

……

……..……

……

ii) What mechanism facilities the movement of the ovum towards uterus. (1mk)

……

……..……

……

12. The diagram below represents the flow of energy in a food chain.

Sun → Grass → Antelope → Leopard → Bacteria → **P**

a) Suggest a reason why the energy labeled P does not enter food chain (1mk)

……

……

……

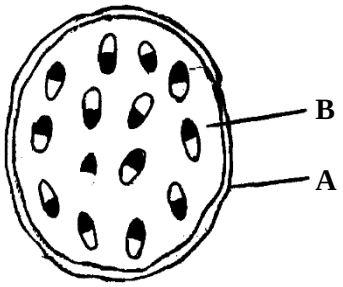
b) State **one** way in which energy is lost from the food chain. (1mk)

……

……

……

13. The diagram below represents the cross section of a part of a certain plant.




a) Name the class of the plant from which the section was taken. (1mk)

……

……

……

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

……

……

……

c) Name the parts labeled **A** and **B**. (2mks)

……

……

……

14. State **two** reasons why the study of biology is important. (2mks)

……

……

……

15. State the economic importance of the following plants excretory procedures. (3mks)

a) Caffeine

……

……

……

b) Quinine

……

……

……

c) Colchicine

……

……

……

16. Define the following terms

a) Irritability (1mk)

……

……

……

b) Stimulus (1mk)

……

……

……

17. A process that occurs in plants is represented by the equation below

$$C_6H_{12}O_6 \longrightarrow 2C_2H_5OH + CO_2 + Energy$$

a) Name the process. (1mk)

……

……..……

……

b) State the importance of the process named in a) above. (2mks)

……

……..……

……

18. a) What is Binomial Nomenclature? (1mk)

……

……..……

……

b) State **two** rules that are followed when printing scientific names. (2mks)

……

……..……

……

19. Name **three**strengthening tissues in dicolyledonous plants. (3mks)

……

……..……

……

20. Name the site for gaseous exchange in insects. (1mk)

……

……..……

……

21. a) What is alternation of generations (2mks)

……

……..……

……

b) Explain why leaves of Peridophytes are referred to as Fronds. (1mk)

……

……

……

22. State **four** adaptations of red blood cells to its functions. (4mks)

……

……

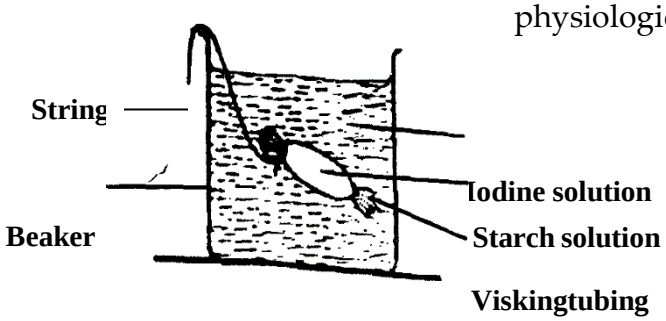
……

……

……

……

23. The experiment illustrated below was set up to investigate a certain physiological process




a) Name the physiological process that was being investigated. (1mk)

……

……

……

b) State the observations that were made after at the end of the experiment

(i) Inside the Visking tubing (1mk)

……

……

……

(ii) Outside the Visking tubing (1mk)

……

……..……

……

c) Account for the observations in b) above. (2mks)

……

……..……

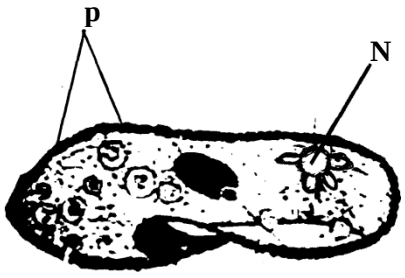
……

24. State the differences between the following structures in wind and insect pollinated flowers. (3mks)

(i) Anther
(ii) Pollen grains
(iii) Stigma

| Wind Pollinated | Insect Pollinated flower |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |

25. A student placed a drop of pond water in a cavity slide and observed it under the microscope. The student observed many fast moving organisms, one of which is represented in the diagram below.




a) Name the kingdom to which the organism belongs. (1mk)

……

……

……

b) Name the structures labeled **P** and **N** (2mks)

**P**……..

**N**……...

26. A person was found to pass out large volumes of dilute urine frequently. Name the;

a) Disease the person was suffering from (1mk)

……

……

……

b) Hormone that was deficient (1mk)

……

……

……

**NAME**_____ **INDEX NO.**_____

**DATE**_____ **ADM**_____

**DATE.**_____ **SIGN**_____ **TARGET**_____

231/1

**BIOLOGY**
**Paper 1**
**Time: 2 Hours.**

# SERIES 2 MARKING SCHEME

Kenya Certificate of Secondary Education (K.C.S.E)

**Instructions**

1. Write your name, Index Number and School in the spaces provided above.
2. Sign and write the date of the examination in the spaces provided above.
3. Answer all the questions in the spaces provided.
4. Additional pages must not be inserted.
5. Check the question paper to ascertain that all the pages are printed and that no questions are missing.

**FOR EXAMINER'S USE ONLY**

| Question | Maximum Score | Candidate's Score |
|---|---|---|
| 1-25 | 80 | |

1. (a). State the meaning of the following terms. (1mark)

(i). Science -

……

……..……

……

(ii). Biology- (1 mark)

……

……..……

……

(b) Explain the following braches of biology. (3 mark)

(i). Zoology -

……

……..……

……

(ii). Entomology -

……

……..……

……

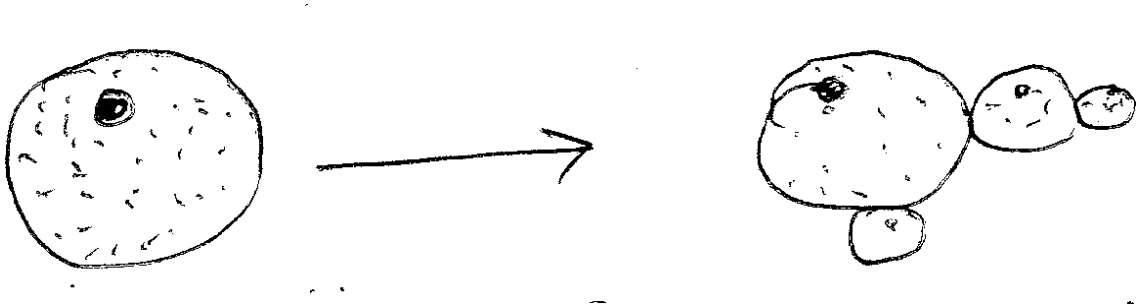
(iii). Morphology –

……

……..……

……

2. The diagram below illustrates a process in an organism of a given species



a.) Identify the process taking place in the organism above. (1 mark)

……

……

……

te two economic importance of the organism above. (2 mark)

……

……

……

3. HIV/AIDS is a major killer disease with no known treatment. Anti-Retroviral drugs are used to manage it.

(a). What is the role of anti-Retroviral drugs in HIV/AIDS management. (1 mark)

……

……

……

(b). Suggest two ways of controlling the spread of HIV/AIDS. (2 marks)

……

……

……

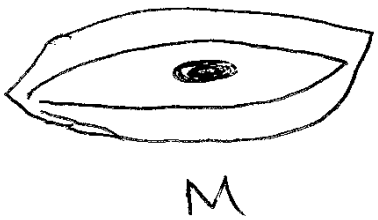
4. Name two bones that articulate to form a ball and socket joint at the hip. (2 marks)

……

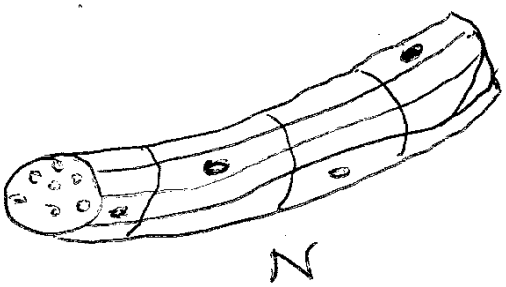
……

……

5. The figures below illustrates specialized cells in an animal's body.



M



N

(i). Identify the cells M and N. (2 marks)

M –

N –

(ii). State the structural differences between M and N. (2 marks)

……

……

……

(iii). Which of the above specialized cells is found in the gut. (1 mark)

……

……

6. Explain why tracheids are not efficient in transporting water up the plant. (2 marks)

……

……

……

7. Insect's blood is noted to lack a respiratory pigment. Explain. (2 marks)

……

……

……

8. Give two destinations of food translocated from the leaves of plants. (2 marks)

……

……..……

……

9. Name the organelle that is likely to be found in abundance in

a.) An enzyme secreting cell. (1 mark)

……

……..……

……

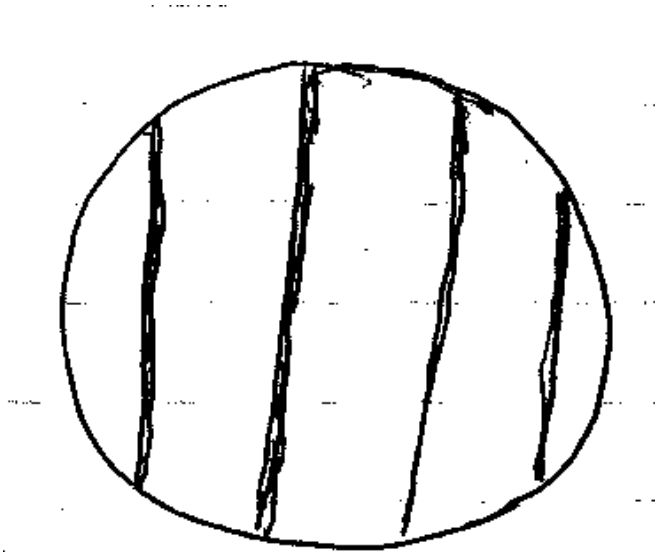
b). Cell producing lipid related secretions (1 mark)

……

……..……

……

10. A form one student trying to estimate the size of onion cells observed the following on the microscope field of view. (2 marks)



If the student counted 20 cells across the field of view. Calculate the size of one cell in micrometers. (3 marks)

……

……

……

……

……

……

11.a). Name the cells that secrete mucus in the human alimentary canal (1 mark)

……

……

……

(b). Explain the role of hydrochloric acid in protein digestion in the stomach of mammals. (2 marks)

……

……

……

12. Assume you are a nutritionist, name the kind of vitamins you would recommend to patients with the following conditions

(a). Poor night vision. (1 mark)

……

……

……

(b). Bleeding gums (1 mark)

……

……

……

(c). Excessive bleeding after an injury. (1 mark)

……

……

……

13. State the characteristics that distinguish the following organisms into their respective classes,millipedes,spider and Tsetsefly (3 marks)

……

……

……

14. Name two classes of phylum Arthropoda with cephalothorax (2 marks)

……

……

……

15. (a). Name the main group of organisms which comprises the kingdom monera. (1 mark)

……

……

……

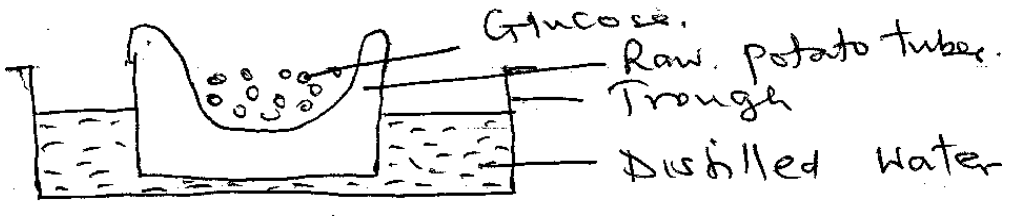
(b). State any three ways in which the organism; named in (a) above affect human lives. (3 marks)

……

……

……

16. (a). The experiment illustrated below was set up to investigate a certain physiological process using a raw Irish potato tuber.



(i). Suggest a possible physiological process that was being investigated. (1 mark)

……

……..……

……

(ii). Explain the results obtained in the above experiment after a few hours. (2 marks)

……

……..……

……

(iii). State the observations that would have been made if the experiment was repeated using boiled potato. (2marks)

……

……..……

……

(b). Explain why growing grass die a few days when salt is sprinkled on it. (3 marks)

……

……..……

……

example o a sec-linked trait in human one

(i). Y- chromosome- (1 mark)

……

……..……

……

(ii). X-Chromosome- (1 mark)

……

……..……

……

18. The diagram below represents a portion of a certain nucleic acid

G A C C A U U C G A

With reason identify the type of nucleic whose portion is shown above

Identify- (1 mark)

……

……..……

……

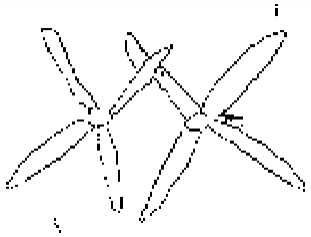
Reason- (1 mark)

……

……..……

……

diagram below show a pair of homologous chromosomes. Study them and answer the questions that follow.



(i). State the genetic significance of the phenomenon. (2 marks)

……

……..……

……

20. The table below shows the percentage composition of carbon (IV) oxide and Oxygen in inhaled and exhaled air. Inhaled air contain oxygen 20% and carbon (IV) oxide 0.04%.

| Gas | Inhaled air | Exhaled air |
|---|---|---|
| Oxygen | 20% | 17% |
| Carbon (IV) Oxide | 0.04% | 40% |

Explain the differences in the percentage of the two gases in inhaled and exhaled air

(a). Oxygen. (2 marks)

……

……

……

(b). Carbon (IV) oxide. (2 marks)

……

……

……

21. Give the forms in which the following gases are transported in blood. (3 marks)

(a). Oxygen

……

……

……

(b). Carbon (IV) Oxide

……

……

……

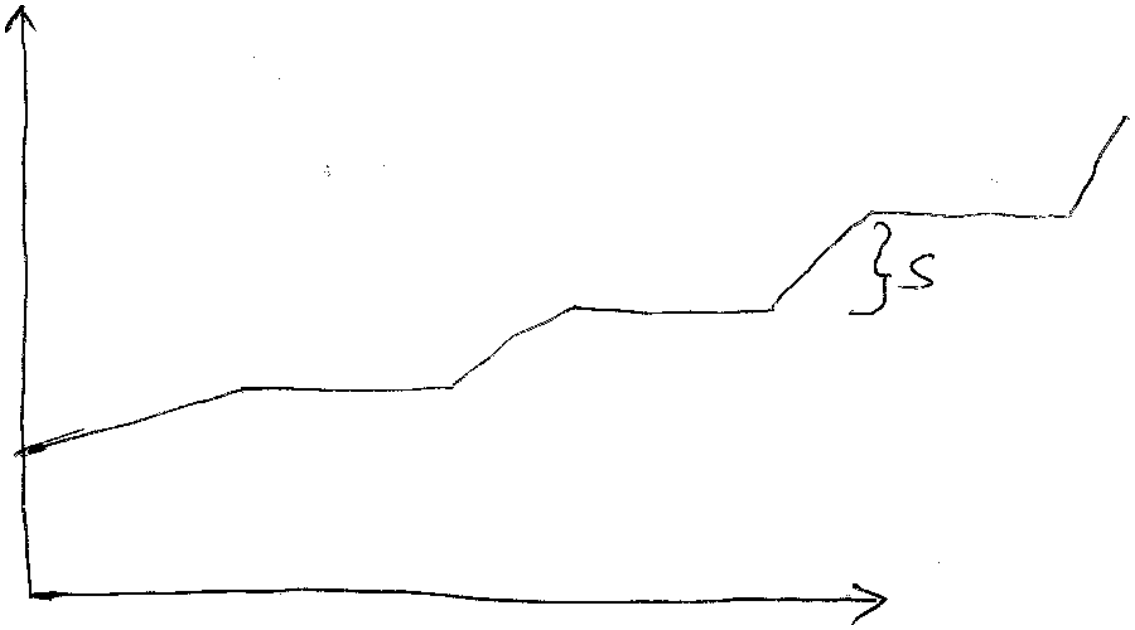
(c). Carbon (II) Oxide

……

……

……

22. The following graph represents a growth pattern observed in a group of animals.




(a). Name the type of growth shown above. (1 mark)

……

……..……

……

(b). Name the phylum of animals whose members display the growth pattern named in (a) above. (1 mark)

……

……..……

……

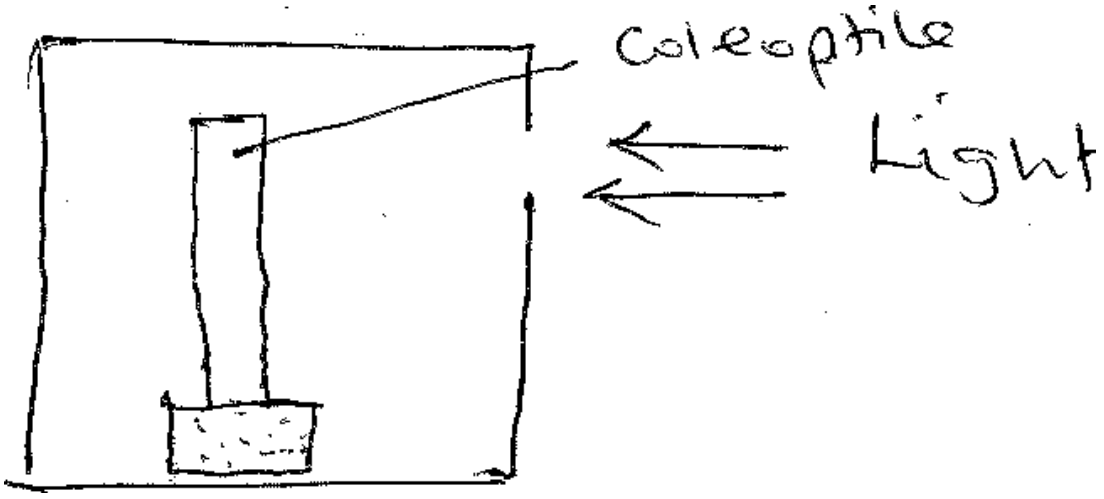
(c). Identify the process which lead to increase in body size at part marked S. (1 mark)

……

……..……

……

23. The diagram below show a tip of a plant coleoptile with light coming towards it from one direction.




(a). How would the plant respond to light. (1 mark)

……

……..……

……

(b). Give the name of such a response. (1 mark)

……

……..……

……

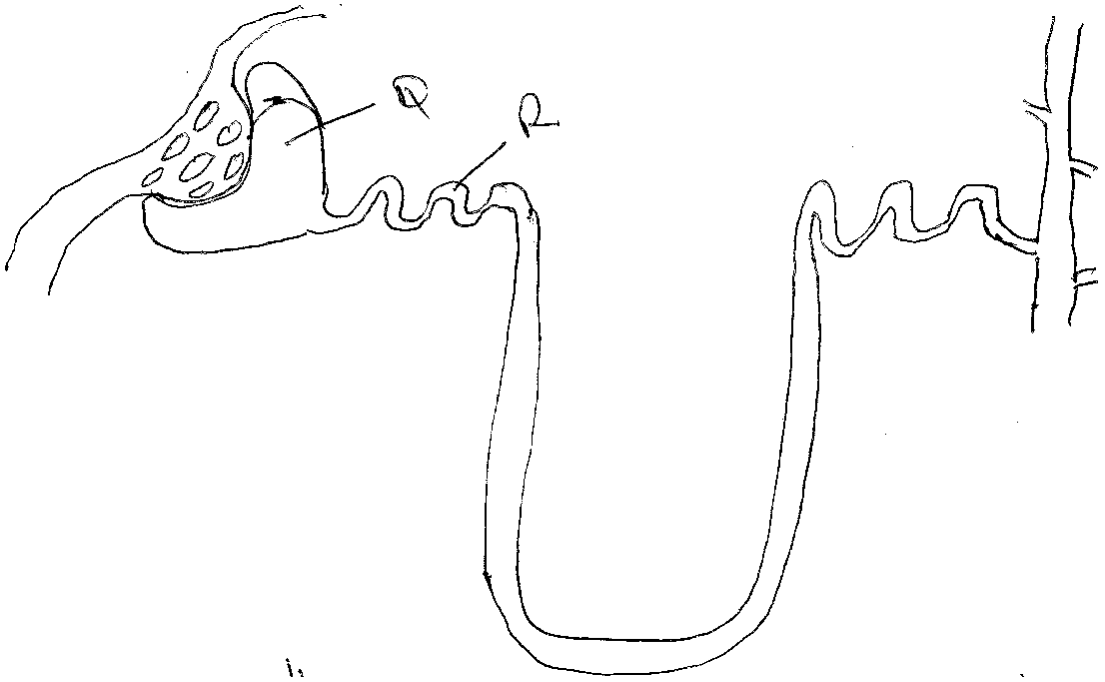
(c). What is the advantage of plant responding in this way? (2 marks)

……

……..……

……

24. The diagram below illustrates parts of a nephron from a mammalian kidney.




(a). Name the fluid found in part labelled Q. (1 mark)

……

……

……

(b). Identify the process that lead to the formation of fluid named in (a) above. (1 mark)

……..

……

……

……

(c). Which two hormones exert their effect in the nephron? (2 marks)

……

……

……

……

25. Name the habitat of the following plants. (2 marks)

(i). Xerophytes –

……

……..……

……

(ii). Halophytes –

……

……..……

……

**NAME**_____ **INDEX NO.**_____

**DATE**_____ **ADM**_____

**DATE.**_____ **SIGN**_____ **TARGET**_____

# SERIES 3 2024 KCSE MOCK

**BIOLOGY**

**PAPER 1**

**TIME: 2 HOURS**

**INSTRUCTIONS TO CANDIDATES:**

0. *Write your name and index number in the spaces provided.*
1. *Sign and write date of examination in the spaces provided above*
2. *Answer all the questions in this paper in the spaces provided.*

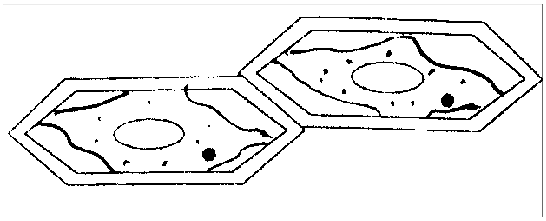
*For Examiner's Use Only:*

| QUESTIONS | MAXIMUM SCORE | CANDIDATE'S SCORE % |
|---|---|---|
| 1- 22 | 80 | |

Kenya Certificate of Secondary Education (K.C.S.E.)

This paper consists of 12 printed pages. Candidates should check to ascertain that all papers are printed as indicated and that no questions are missing

b.) Study the diagram below showing a portion of an onion epidermis that had been irrigated with a certain solution X.



a) In <u>one</u> word describe the condition of the cells (1mk)

……

……..……

b) Describe the process that lead to the condition named above. (3mks)

……

……..……

……

……..……

……

……..……

2. The following reaction may proceed in forward or backward direction

Glucose + fructose ⇌ sucrose + water.

a) What term is used to refer to the backward reaction. (1mk)

……

……..……

b) In which part of alimentary canal does the backward reaction occur? (1mk)

……

……..……

c) Name the enzyme that catalyzes the backward reaction. (1mk)

……

……..……

3. A certain metabolic pathway takes the following sequence.

J ⟶ K ⟶ L ⟶ M ⟶ N

At the start of the experiment an inhibitor was added to the reactants. After the experiment it was found out that there was the same concentration of J, more than normal concentration of K, near absence of L, M and N. When L was added to the inhibitor set M and N were detected.

a) At what stage of the reaction sequence did the inhibitor have its effect? (1mk)

……

……..……

b) Explain how the inhibitor affected the reaction. (1mk)

……

……..……

c) What is the identity of substance L? (1mk)

……

……..……

4. After fertilization of an ovule, which parts develops into: -

a) Testa (1mks)

……

……..……

b) Endosperm (1mk)

……

……..……

5a) Explain two roles of diffusion in human beings. (4mks)

……

……..……

……

……..……

……

……..……

bi) Name the process through which a plant takes up some mineral ions against a concentration gradient. (1mk)

……

……..……

ii) State two factors that may affect the process named in b(i) above. (2mks)

……

……..……

c) Distinguish between haemolysis and plasmolysis. (1mk)

……

……..……

……

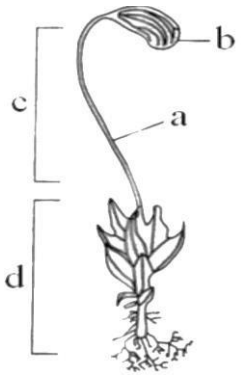
……..……

6. An insect landed on a leaf of an insectivorous plant. Consequently, the leaf closed with its spines interlocking trapping the insect inside it. Name the response exhibited by the leaf. (1mk)

……

……..……

7. The figure below represents a plant.




6. State the division it belongs to. (1mk)

……

……..……

7. Label the parts labeled (2mk)

**a.** ……

**b.** ……

c) State the role of part labeled **d** in the life cycle of the organism. (1mk)

……

……..……

8. State any two adaptations of the cardiac muscle that enable it to undergo systole.

i) (2mks)

……

……..……

-ii)

……

……..……

9.A respiratory substrate has the formula $C_{57}H_{110}O_6$.

a) Write a balanced equation to represent its complete oxidation to carbon dioxide and water. (1mk)

……

……..……

b) Why are carbohydrates and not lipids the first choice respiratory substrates? (2mks)

……

……..……

……

……..……

c) Calculate the RQ from the equation in (a) above. (2mks)

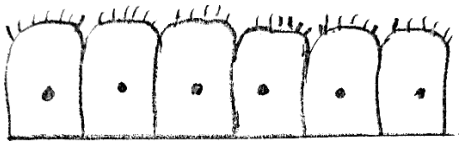
……

……..……

……

……..……

10. Below is a diagram of a group of cells of a specific tissue.



i) Name the tissue (1mk)

……

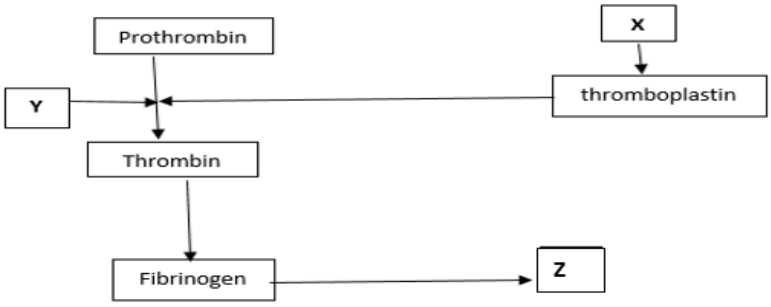
……..……

ii) This tissue lines the trachea and bronchi. Suggest its function in these structures. (1mk)

……

……..……

11. Study the flow chart below which represents a physiological process in mammals




ai) Name blood components represented by **X.** (1mk)

……

……..……

ii) What is the significance of product represented by **Z**. (2mks)

……

……..……

……

……..……

b) Under what condition is thrombokinase released by the platelets? (1mk)

……

……..……

……

……..……

12 a) Explain what happens to excess amino acids in the liver of humans. (3mks)

……

……..……

……

……..……

……

……..……

b) Which portions of the human nephron are only found in the cortex? (1mks)

……

……..……

13.A potted plant is transferred from outside on a sunny and windy day, to a dark room.

a) Briefly explain the effect this is likely to have on:

i) The rate of loss of water from its leaves. (3mks)

……

……..……

…..……..……..……

……

…..……..……

……..……..……

ii) The rate of water absorption. (2mks)

……

……..……

……

……..……

14.Give a reason why urine of a mammal does not contain amino acids. (1mks)

……

……..……

15.a) In what form is energy stored in muscles? (1mk)

……

……..……

b) State the role of insulin in human body. (3mks)

……

……..……

……

……..……

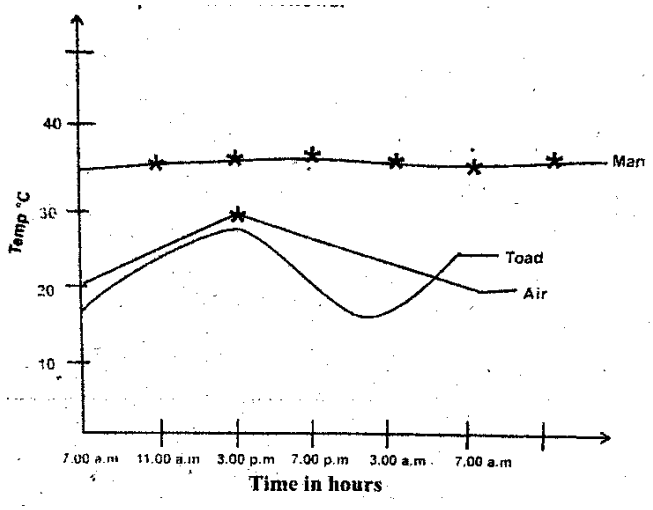
16. Name the processes that take place in the liver to bring about differences between blood in the Hepatic portal vein and that in the hepatic vein. (3mks)

i) ……

ii) ……

iii) ……

17. The graph below shows how the body temperature of a toad and man varies with time in hours. Study it and answer the questions that follow.




a) What is the relationship between the body temperature of the toad and that of the atmospheric air? (1mk)

……

……..……

……

……..……

b) State two corrective measures that maintains man's body temperature at norm even when the environmental temperature is below $30^0$C. (2mks)

……

……..……

……

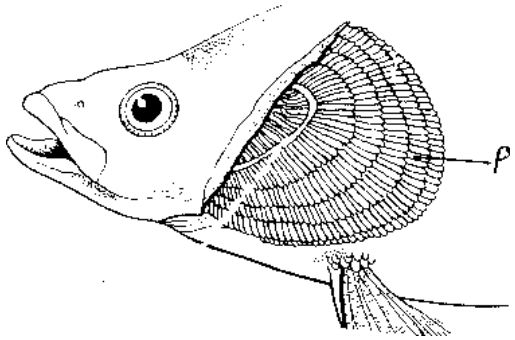
……..……

c) Give one behavioral adaptation observed in a lizard when the environmental temperature is above $39^0$C. (1mk)

……

……..……

18. The figure below shows the exposed breathing apparatus of a fish.




a) Name the structure that was removed to expose the apparatus. (1mk)

……

……..……

b i) Name structure P. (1mk)

……

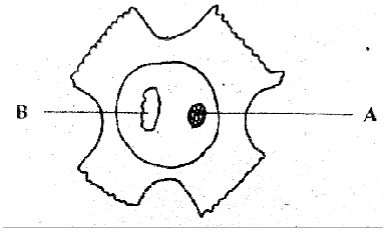
……..……

ii) State two structural adaptations of the respiratory surface in insects. (2mks)

……

……..……

19. The following is a reproductive structure of a plant.




a) Identify the structure. (1mk)

……

……..……

b) Name the sub-division of the plants that produces the above reproductive structure. (1mk)

……

……..……

ci) Name structure B. (1mk)

……

……..……

ii) What is the function of structure A? (1mk)

……

……..……

20. Nucleic acids are made up of nucleotides that bears a sugar component.

a) Name the sugar component found in: - (2mks)

i) DNA fragment .....

ii) RNA fragment .....

**b)** The following nucleotide sequence was found in a segment of DNA: - **A G C C T.**

Write down the complementary base sequence in the corresponding m RNA segment during transcription. (1mk)

.....

.....

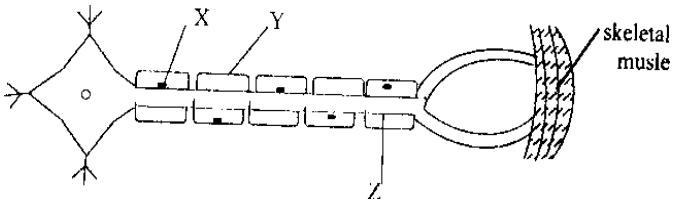
c) A point mutation altered the base sequence from the original to **G G C C T**.

Identify the type of gene mutation. (1mk)

.....

.....

21. Below is a drawing of a cell.




11. With two reasons, identify the cell. (3mks)

Identify. .....

Reasons:

i) .....

.....

.....

ii) .....

……...……..…

……

12. Which of the three structure X, Y and Z speeds up transmission of the impulse. (1mk)

……

……..……

22.a) State two structural differences between skeletal muscles and smooth muscles. (4mks)

| Skeletal muscle | Smooth muscle |
|---|---|
| (i) | |
| (ii) | |

b) What are antagonistic muscles? (1mk)

……

……..……

**NAME**_____ **INDEX NO.**_____

**DATE**_____ **ADM**_____

**DATE.**_____ **SIGN**_____ **TARGET**_____

# SERIES 3 2024 KCSE MOCK

**BIOLOGY**

**PAPER 1**

**TIME: 2 HOURS**

**INSTRUCTIONS TO CANDIDATES:**

3. *Write your name and index number in the spaces provided.*
4. *Sign and write date of examination in the spaces provided above*
5. *Answer all the questions in this paper in the spaces provided.*

**FOR EXAMINER'S USE ONLY:**

| Question | Maximum Score | Candidate's Score |
|---|---|---|
| 1 - 27 | 80 | |

**ATTEMPT ALL THE QUESTIONS**

1. Some form one students wanted to collect the following animals for study in the laboratory. **State** the suitable apparatus they should use.

i) Housefly (1 mk)

……..

……..

ii) Scorpion (1 mk)

……..

……..

iii) Ants (1 mk)

……..

……..

2. State **two** reasons why a snake is classified as a reptile. (2 mks)

……..

……..

……..

……..

3. (a) **Explain** the role of oxygen in Active transport (1mk)

……..

……..

(b) Name **two** processes that depend on Active transport in animals (2mks)

……..

……..

……..

……..

4. **Explain** how sunken stomata lower the rate of transpiration (2mks

……..

……..

……..

……..

5. **State** how xylem vessel is adapted to its function (3mks)

……..

……..

……..

……..

……..

……..

6). a) **Define** the term immunity. (1mk)

……..

……..

……..

……..

..

b) **Distinguish** between natural immunity and acquired immunity. (1mk)

……..

……..

……..

……..

c) Identify **one** immunizable disease in Kenya. (1mk)

……..

……..

7. (a) State **two** adaptations of the alveolus to its functions. (2mks)

……..

……..

……..

……..

**(b) Suggest** a reason for asthmatic patient producing a wheezing sound during breathing? (1mk)

……..

……..

**(c) What** is the significance of the cartilage found in the human trachea being incomplete (c-shaped rings) (1mk)

……..

……..

8. **Define** the following terms;

(i) Inter specific competition. (1mk)

……..

……..

(ii)Carrying capacity (1mk)

……..

……..

9. Suggest **two** methods that can be used to determine the type of food eaten by animals. (2mks)

……..

……..

……..

……..

10.(a)State **one** significance of genetics counseling (1mk)

……..

……..

(b) Part of a strand of DNA molecules was found to have the following sequence A-T-C-G-G-G-A-T-C-T. What is the sequence?

(i) Of the complementary strand? (1mk)

……..

……..

(ii) On a m- RNA strand copied (1mk)

……

……..

……..

11). The paddles of whales and the fins of fish adapt these organisms to aquatic habitats.

a) **Name** the evolutionary process that may have given rise to these structures. (1mk)

.....

……..

……..

b) What is the **name** given to such structures? (1mk)

……..

……..

c) Give **two** examples of vestigial organs in man. (2mks)

……..

……..

……..

……..

……..

……..

12. Name the organelles that carry out the following functions (4mks)

- Destroy old and worn-out organelles

……..

……..

- Formation of spindle fibres

……..

……..

- Osmoregulation

……..

……..

- Selective passage of substances into the cell

……..

……..

13. (a) Why would you give an athlete glucose and not sucrose after a race? (1mk)

……..

……..

(b) What happens to lactic acid after oxygen debt recovery? (2mks)

……..

……..

……..

……..

14.**State** the difference between glycolysis and kreb"s cycle based on the following.

a) where they occur . ( 1 mk)

……..

……..

b) Amount of energy produced. ( 1 mk)

……..

……..

……..

……..

c) End product(s) (1 mk )

……..

……..

……..

……..

15. a) Under which of the following magnifications would one see a larger part of the specimen X40 0r X500? Give a reason. (2 mks)

……..

……..

……..

……..

b) State how magnification is worked out in a light microscope. (1 mk)

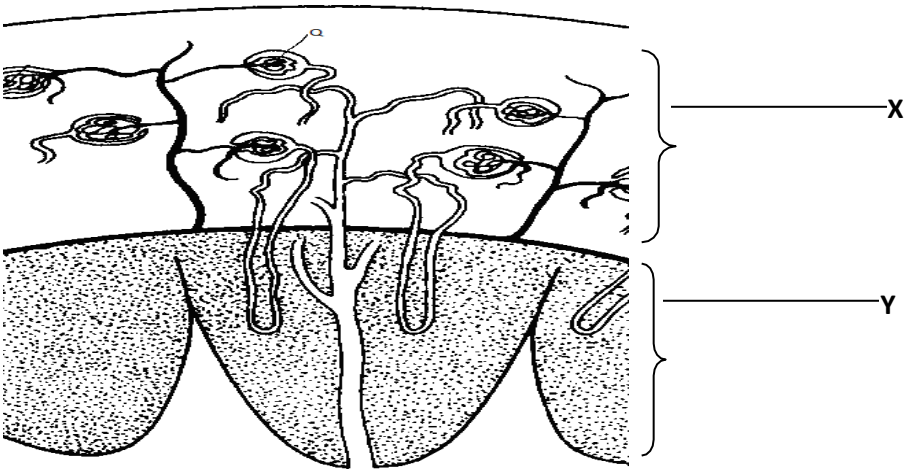
……..

……..

……..

……..

16. The illustration below shows a transverse section through a mammalian kidney.




(a) **Name** the structures labelled **X** and **Y**.

**X**..... (1mk)

**Y** ……

(1mk)

(b) **State** the process in **Q** that leads to the formation of glomerular filtrate. (1mk)

……..

……..

c) State one function of sebum

(1 mk)

……

……..

……..

17. State **three** differences in composition between umbilical artery and umbilical vein. (3 marks)

| Umbilical vein | Umbilical artery |
|---|---|
| | |
| | |
| | |

18. (a)**What** is meant by the term taxonomy? (1mk)

……

……..

……..

(b)**When** are two organisms considered to belong to the same species. (2mks)

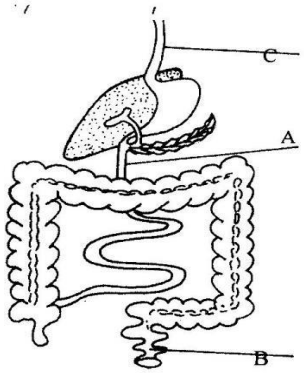
……..

……..

……..

……..

19).The diagram below shows part of alimentary canal of a mammal




**(i) Name** the parts labeled **A** and **C**

(2mks)

**A** ……

**C** ……

(ii) **State** the function of the part labeled **B.** (1mk)

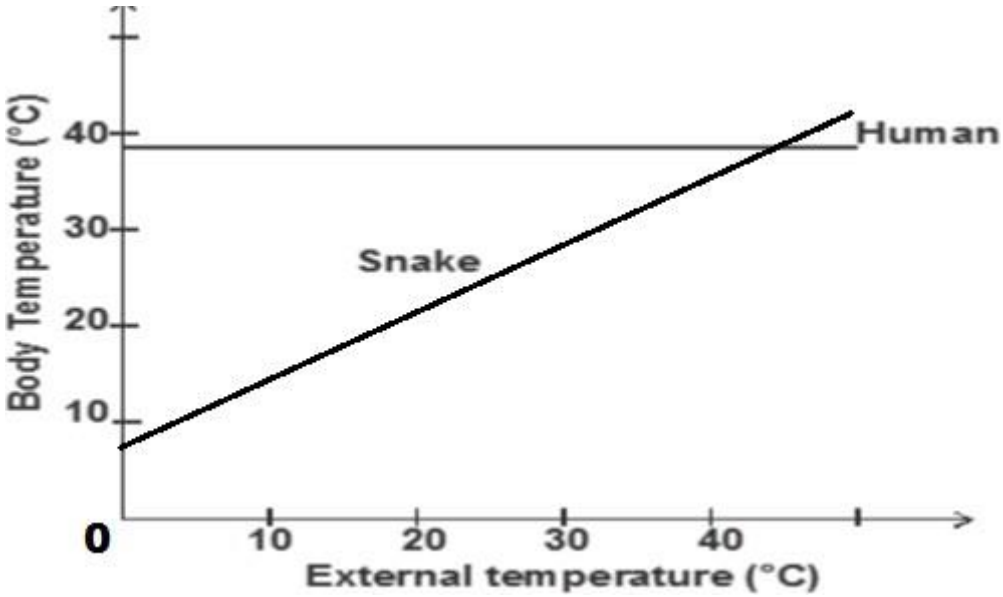
……..

……..

……..

……..

20). The graph below shows the relationship between body temperatures and external temperatures in a human being and a snake. **Study** it and answer questions that follow.




a) **What** happens to the temperature of each organism as the external temperature increases. (2 mks)

Human –

……

……..

……..

Snake –

……

……..

……..

b) Humans are described as homoithermic. **State** the advantage of this condition. (2mks)

.....

……..

……..

……..

……..

21.**a)**State **three** differences between light stage and dark stage of photosynthesis. (3 mks)

| **Light stage** | **Dark stage** |
|---|---|
| | |
| | |
| | |

22. Define;

i) Pulmonary circulation

(1mk)

……..

……..

……..

……..

ii) Systemic circulation (1mk)

……..

……..

……..

……..

23 **.**The diagram below represents a plant cell that was subjected to a certain treatment.

**At the start** **At the end of the experiment**

**a) Account** for the shape of the cell at the end of the experiment. (2 mks)

……..

……..

……..

……..

**b) Draw** a diagram to illustrate how an animal cell would appear if subjected to the same treatment. (1mk)

……..

……..

……..

……..

……..

……..

……..

……..

……..

24. a) **Give** a reason why each of the following steps are followed when preparing cross sections of a leaf for examination under a microscope.

i) Cutting thin sections. (2 mk)

……..

……..

……..

……..

ii) Placing the sections in water. (1 mk)

……..

……..

……..

‘

25. Explain **why** the population of people with sickle cell anaemia is higher in malaria prone areas. (3mks)

……..

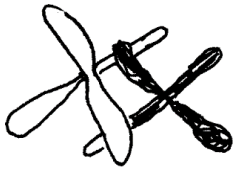
……..

……..

……..

……..

26. The diagram below is of a stage in cell division



With a reason identify the stage.

Stage (1 mk)

……..

……..

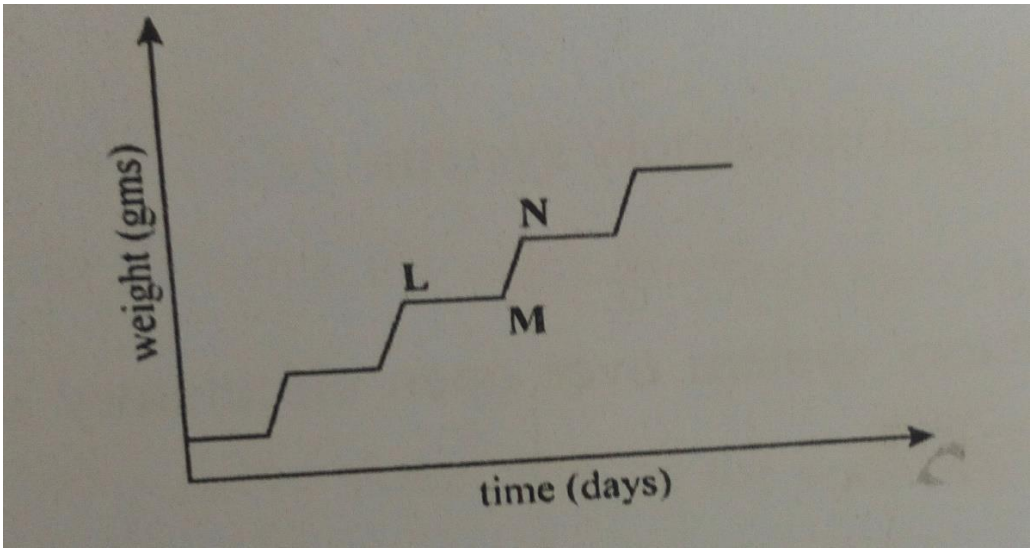
Reason (1 mk)

……..

……..

……..

27. The graph below represents growth pattern in a group organism




27. Name the type of growth curve (1 mk)

……..

……..

28. Name the phylum that shows this type of pattern (1 mk)

……..

……..

29. State one disadvantage of this type of pattern (1 mk)

……..

……..

**NAME**_____ **INDEX NO.**_____

**DATE**_____**ADM**_____

**DATE.**_____**SIGN**_____**_TARGET**_____

**231/1**

**BIOLOGY**

**PAPER 1**

**TIME: 2 HOURS**

# SERIES 5 2024 KCSE MOCK

## FORM FOUR EXAM

*Kenya Certificate of Secondary Education.(K.C.S.E)*

BIOLOGY THEORY

PAPER 1

**INSTRUCTIONS TO CANDIDATES**

28. Write your name, admission number, date, and signature and school name in the spaces provided.
29. Answer all the questions
30. Answers must be written in spaces provided

- ***This paper consists of 12 printed pages. Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.***

**FOR EXAMINERS USE ONLY**

| SECTION | MAXIMUM SCORE | STUDENTS SCORE |
|---|---|---|
| 1-24 | 80 | |
| TOTAL | 80 | |

1.a) Define the term specimen. (1mk)

.....

.....

b) Give two significances of collecting specimens in biology. (2mks)

.....

.....

.....

2. Give three reasons why *Drosophila melanogaster* is considered suitable for use in genetic experiments. (3mks)

.....

.....

.....

.....

.....

.....

3. List two factors you would consider before selecting a microscope for use in a biological study. (2mks)

.....

.....

.....

.....

4. A group of form two students placed a fresh leaf in warm water. They observed that air bubbles formed on the surface of the leaf.

a) What biological process were they investigating? (1mk)

.....

.....

.....

b) Name the structures from which the air bubbles were coming from. (1mk)

.....

.....

.....

c) Explain the distribution of the structures named in (b) above on the leaf surfaces of an aquatic plant.

(2mks)

.....

.....

.....

.....

.....

5. Differentiate between hydrolysis and condensation. (2mks)

.....

.....

.....

.....

6. (a) Which sets of teeth would be used in chewing sugarcane for maximum extraction of sap? (2mks)

.....

.....

.....

(b) What is the advantage of heterodont dentition over homodont dentition? (1mk)

.....

.....

.....

.....

(b) During digestion name the enzyme that acts on the sugarcane sap and give the final products. (2mks)

Enzyme

.....

.....

.....

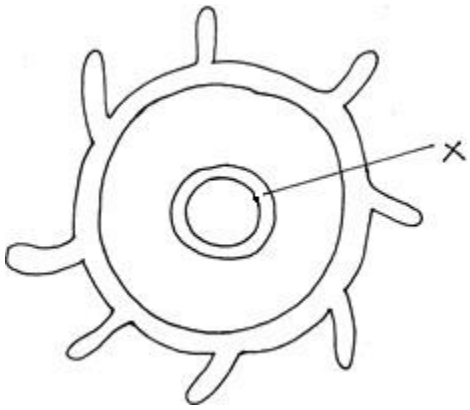
Final products

.....

.....

.....

7. Study the diagram below and answer the questions that follow.




a) The part labelled X turned blue black after iodine solution was applied on the cut cross section of the above specimen

i) Name part X (1mks)

.....

.....

.....

ii) Give a reason for your answer. (1mks)

.....

.....

.....

.....

b) State two phenomenons of stomata which reduce the rate of transpiration. (2mks)

.....

.....

.....

.....

.....

8. a) What is respiratory quotient? (1mks)

.....

.....

b) Explain why it is difficult to measure respiratory quotient in plants. (2mks)

.....

.....

.....

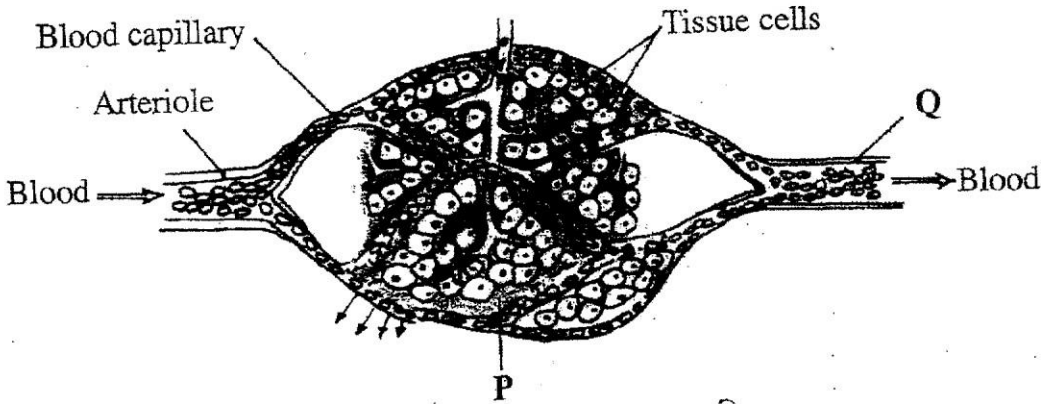
.....

.....

9. Study and complete the table below. (3mks)

| Character | Monocot | Dicot |
|---|---|---|
| a) Number of stamens | | |
| b) Arrangement of vascular bundle in stem | | |
| c) Type of root | | |

10. The diagram below shows blood circulation in a mammalian tissue.




a) Give the name of the above section of the blood circulation system. (1mks)

.....

.....

.....

b) Explain two the adaptation of the above section to its function. (2mks)

.....

.....

.....

.....

c) What is the name of blood vessel Q. (1mk)

.....

.....

.....

11. Differentiate between dioecious and monoecious plants. (2mks)

.....

.....

.....

.....

.....

12.a) Why does endosperm weight of a germinating seed decrease as the weight of the shoot increases. (l mks)

.....

.....

.....

b) State three importance of the pupa stage of metamorphosis to insects. (lmks)

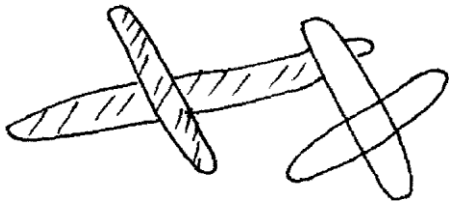
.....

.....

.....

.....

13. The diagrams below show a pair of homologous chromosomes. Study them and answer the questions that follow.



i) State the phenomenon shown above. (lmk)

.....

.....

ii. What is the genetic significance of the phenomenon above? (lmk)

.....

.....

iii. Name the type of mutation caused by the above phenomenon. (2mks)

.....

.....

.....

.....

14. In an experiment to determine the population of Tilapia fish in a school fish pond, students of Canada school decided to use capture-recapture method.

a) Name three vital tools the students would need for the exercise. (3mks)

.....

.....

.....

.....

.....

.....

b) State two factors that might affect the accuracy of their results. (2mks)

.....

.....

.....

.....

.....

.....

15. The table below show description of sizes of glomeruli and renal tubules of two animals, which are in different environments.

| | Animal Q | Animal W |
|---|---|---|
| Glomeruli | Few | Many |
| Renal tubules | Long | Short |

a) Name the likely environment in which each animal lives. (2mks)

Q –

.....

.....

.....

W-

.....

.....

.....

b) Suggest the main nitrogenous waste produced by animal W. (lmk)

.....

.....

.....

.....

.....

c) What is the importance of the renal tubules being long? (lmk)

.....

.....

.....

16. What is the role of the following hormones in human reproduction?

i) Follicle stimulating hormone in male (lmk)

.....

.....

.....

.....

ii) Luteinizing hormone during menstrual cycle. (lmk)

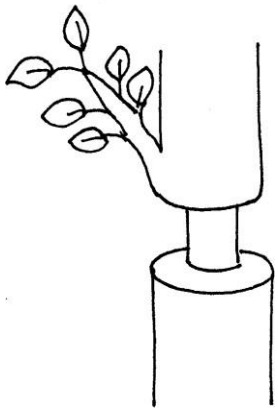
.....

.....

.....

.....

17. Below is representation of an experiment that was carried out on a tree in Kayombe forest.



a) Which two tissues are removed in a ring bark experiment? (2mks)

.....

.....

.....

.....

b) Removal of the tissues above leads to some effects to the plant. Name these 2 effects. (2mks)

.....

.....

.....

c) State and explain the observation that would be made in the plant above after some time. (3mks)

.....

.....

.....

.....

.....

.....

18. A section of nucleic strand contains the following sequence.

A — C — G — A — G — A — T — A— C

a) i) Write the complimentary DNA stand. (lmk)

.....

.....

.....

ii) Write the mRNA strand of the strand in (a) above. (lmk)

.....

.....

.....

b) Name the site for protein synthesis in a cell. (lmk)

.....

.....

.....

c) State one disorder caused by non-disjunction mutation. (lmk)

.....

.....

.....

.....

19. i) State the importance of rings of chitin in the tracheal system of insects. (lmk)

.....

.....

.....

ii) Explain the significance of maintaining a steep concentration gradient in the respiratory surfaces of animals. (lmk)

.....

.....

iii) Explain why a bony fish dies shortly after being removed from water. (3mks)

.....

.....

.....

.....

.....

20. Explain why Lamark's theory of evolution is not accepted by modern scientist. (2mks)

.....

.....

.....

.....

21. Name the branch of biology that deals with;

a) Relationship between antelopes and gazelles in their environment. (lmk)

.....

.....

.....

b) Study of Ebola virus. (lmk)

.....

.....

.....

c) Explain what would happen if a given of living things lose their ability to reproduce. (lmk)

.....

.....

.....

.....

22. Explain the following when testing a leaf for starch.

i) Boiling the leaf in hot water. (lmk)

.....

.....

.....

.....

ii) Destarching (lmk)

.....

.....

.....

.....

iii) Boiling the leaf in methylated spirit. (lmk)

.....

.....

.....

23. Explain why osmosis is a special type of diffusion. (lmk)

.....

.....

.....

.....

24. Explain three protective functions of the blood. (3mks)

.....

.....

.....

.....

.....

.....

.....

.....

**THIS IS THE LAST PRINTED PAGE!**

**NAME**_____ **INDEX NO.**_____

**DATE**_____ **ADM**_____

**DATE.**_____ **SIGN**_____ **TARGET**_____

**231/1**

**BIOLOGY**

**PAPER 1**

**TIME: 2 HOURS**

# SERIES 6 2024 KCSE MOCK

## FORM FOUR EXAM

*Kenya Certificate of Secondary Education.(K.C.S.E)*

BIOLOGY THEORY

PAPER 1

**INSTRUCTIONS TO CANDIDATES**

**27.** Write your name, admission number, date, and signature and school name in the spaces provided.
**28.** Answer all the questions
**29.** Answers must be written in spaces provided

- ***This paper consists of 12 printed pages. Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.***

**FOR EXAMINERS USE ONLY**

| QUESTION | MAXIMUM SCORE | CANDIDATES SCORE |
|---|---|---|
| 1 - 25 | 80 | |
| **TOTAL** | **80** | |

ii) State the characteristics of living things that is shown by:

a) Spore formation (1mk)

Name:_____

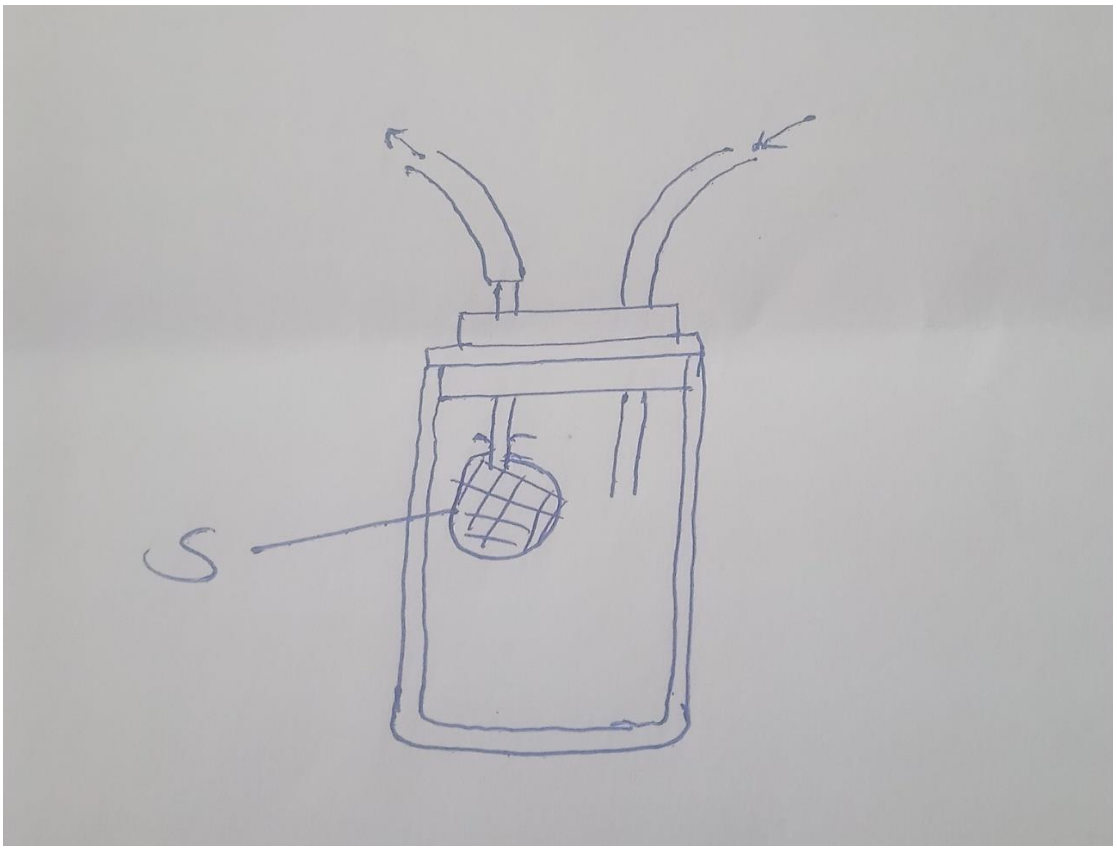
Function : _____

b) Contraction and relaxation of Skeletal muscles (1mk)

.....

.....

iii) The diagram below shows an apparatus that is used in the study of biology




b.) Give the name of the apparatus and state its function (2mks)

.....

.....

.....

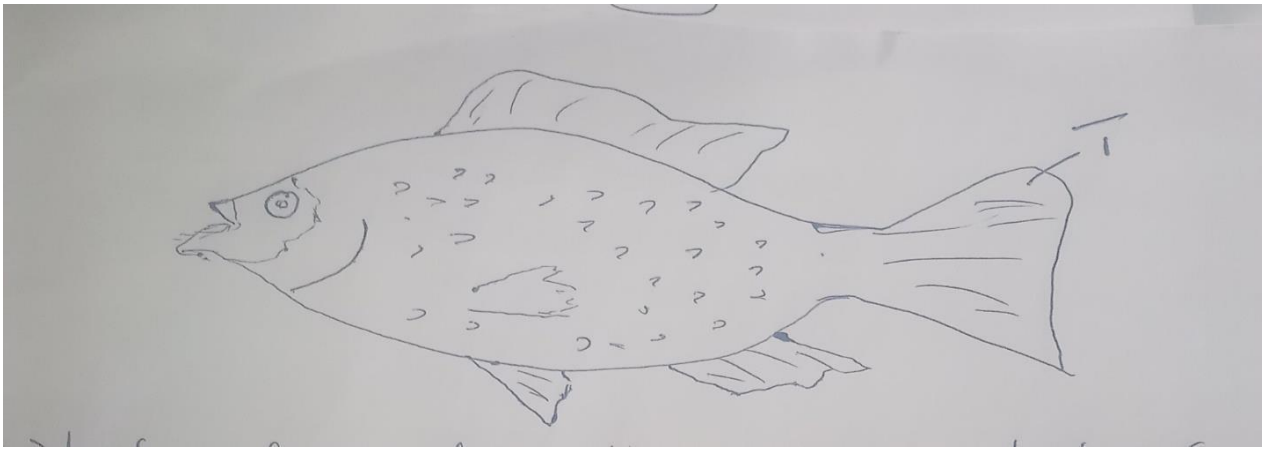
.....

c.) What is the function of the part labelled S (1mk)

.....

.....

iv) A student observed an organism and drew the diagram shown below.



**30.** In which class does the organism belong (1mk)

.....

.....

**31.** State **two** functions the part labelled T (2mks)

.....

.....

.....

.....

.....

.....

.

**32.** If the magnification of the diagram was X0.78 what is the actual of the organism (3mks)

.....

.....

.....

.....

v) A student while using a light microscope and after clicking in position of the revolving nose observed through the eye- piece and did not see the field of view. State **two** adjustments that were to be carried on the microscope to correct this (2mks)

.....

.....

.....

.....

.....

.....

vi) How is the following achieved during preparation of temporary slides for viewing

30. Prevention of distortion of cells and tissues of a specimen (1mk)

.....

.....

31. Prevent desiccation (1mk)

.....

.....

vii) Explain why active transport cannot be demonstrated in the laboratory using a visking tubing (2mks)

.....

.....

.....

.....

viii) State **two** adaptations of the chloroplast to its functions (2mks)

.....

.....

.....

.....

ix) Describe how dental carries arises (3mks)

.....

.....

.....

.....

x) List **three** enzymes contained in the pancreatic juice (3mks)

.....

.....

.....

.....

i) (a) What are the functions of the vascular bundles (2mks)

.....

.....

.....

.....

ii) (b) Explain how the cuticle reduce the rate of transpiration (3mks)

.....

.....

.....

.....

iii) How do the following structures assist an insect to carry out the process of gaseous exchange

a) Spiral bands of chitin (1mk)

.....

.....

b) Muscular valves on the spiracles (1mk)

.....

.....

iv) State the functions of the following parts in the heart of a mammal

c.) Coronary artery (1mk)

.....

.....

d.) A layer of fats (1mk)

.....

.....

e.) Atrioventricular septum (1mk)

.....

.....

.....

.....

v) Explain why a person with blood group $O^{+ve}$ cannot donate blood to a person with blood group $O^{-ve}$ (3mks)

.....

.....

.....

.....

.....

.....

vi) Explain why o amoeba does not require elaborate gaseous exchange system with organs (3mks)

.....

.....

.....

.....

.....

.....

vii) State **two** application of anaerobic respiration in agriculture (2mks)

.....

.....

.....

.....

viii) Explain how the following structures adapt the skin to its functions

13. Sebaceous glands (2mks)

.....

.....

.....

.....

14. Subcutaneous fat (2mks)

.....

.....

ix) A group of students wanted to investigate the action of catalase enzyme on hydrogen peroxide. They crushed a small piece of fresh organ and put it in a test tube. They then add hydrogen peroxide.

- State the observation made (1mk)

.....

.....

- In which organ does the above process take place in mammal (1mk)

.....

.....

- Give the name of the process that takes place in the organ above represented by the experiment (1mk)

.....

.....

.....

.....

- Why was the organ crushed into small pieces (1mk

.....

.....

.....

.....

x) State **three** distinguishing features of the members of the class Arachnida (3mks)

.....

.....

.....

.....

.....

.....

xi) Explain why primary productivity reduces as

a) Depth in water increases (2mks)

.....

.....

.....

.....

b) What is eutrophication (1mk)

.....

.....

.....

.....

i) (a) Describe how protandry hinders self-pollination and self-fertilization (2mks)

.....

.....

.....

.....

ii) (b)State **two** ways in which the movement of the ovum in the fallopian tube is aided (2mks)

.....

.....

.....

.....

i) (a) Give **two** tissues in plants responsible for secondary growth (2mks)

.....

.....

.....

.....

ii) (b) Explain why arthropods do not experience continuous growth (3mks)

.....

.....

.....

.....

.....

.....

iii) A man and a woman who are both blood group gives birth to a child who is blood O. using a punnet square. Explain how this is possible (4mks)

.....

.....

.....

.....

iv) Explain why continued use of a certain pesticide leads to resistance to the pesticide (3mks)

.....

.....

.....

.....

.....

.....

v) A girl could clearly read a book placed 10cm away but could not identify her friend 10m away.

b) What eye defect was she suffering from (1mk)

.....

.....

c) Explain why she could not identify her friend but could read the book (3mks)

.....

.....

.....

.....

.....

.....

d) Explain how the defect can be corrected (1mk)

.....

.....

vi) State **two** characteristics that distinguish cardiac muscle from the other types of muscles (3mks)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

**NAME**_____ **INDEX NO.**_____

**DATE**_____ **ADM**_____

**DATE.**_____ **SIGN**_____ **TARGET**_____

**231/1**

**BIOLOGY**

**PAPER 1**

**TIME: 2 HOURS**

# SERIES 7 2024 KCSE MOCK

## FORM FOUR EXAM

*Kenya Certificate of Secondary Education.(K.C.S.E)*

BIOLOGY THEORY

***INSTRUCTION TO CANDIDATES***

- **Write your name and admission number in the spaces provided above.**
- **Sign and write the date of the examination in the spaces provided.**
- **Answer ALL the questions in this question paper.**
- **Answers must be written in the spaces provided**
- **This paper consists of 10 printed pages.**
- **Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.**
- **Candidates should answer all the questions in English.**

**FOR EXAMINER'S USE ONLY.**

| QUESTION | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| SCORE | | | | | | | | | |

| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
|---|---|---|---|---|---|---|
| | | | | | | |

Answer all the questions in the spaces provided.

1. State two characteristics of organisms that are easily observed in both animals and plants. (2 marks)

……

……

……

2. Fingerlings of fish were introduced to two different ponds. Those fingerlings in bond one all died within four days but the fingerlings in pond two survived.

Suggest the likely reasons why the fingerlings in pond one died. (3 marks)

……

……

……

……

3. A student observing a specimen through a microscope viewed a blurred image of the specimen. Suggest two possible reasons for this observation. (2 marks)

……

……

……

……

4. State two processes that take place during anaphase of mitosis. (2 marks)

……

……

……

……

5. Distinguish between convergent and divergent evolution. (1 mark)

……

……

……

……

6. (a) Terrestrial insects such as locusts were captured and their blood was analysed. It was found that the blood does not have blood pigments such as haemoglobin. Explain. (2 marks)

……

……

……

(b) State how the tracheal system in insects is adapted to gaseous exchange. (3 marks)

……

……

……

……

……

……

7. State two functions of a diastema in herbivores. (2 marks)

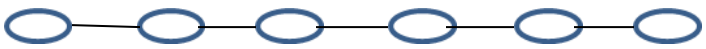
……

……

……

……

8. The diagram below shows part of a starch molecule.



(a) Identify what the circles and the lines joining them represents. (2 marks)

Circles

……

……

Lines

……

……

(b) Draw how the structure will appear after the enzyme amylase has acted on the starch molecule and name the products. (2 marks)

Drawing:

Products

……

……

9. Explain two ways in which the chloroplast is adapted to photosynthesis. (2 marks)

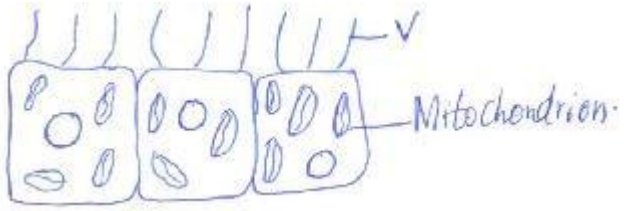
……

……

……

……

10. The diagram shown below represent cells from a certain type of epithelial tissues in mammals.




(a) Name the part labeled V. (1 marks)

……

……

(b) Identify the region of the mammalian body where the epithelial tissue maybe found. (1 mark)

……

……

(c) What is the role of the numerous mitochondria in the epithelial cells as shown above.
(2 marks)

……

……

……

……

11. Explain what would happen to red blood cells if blood glucose concentration increased due failure of the secretion of insulin. (3 marks)

……

……

……

……

……

12. State three biotic factors that could affect an antelope living in Masai Mara. (3 marks)

……

……

……

……

……

13. A drop of a person's blood shows clumping in serum of blood group B but not in serum of blood group A.

(a) Identify the blood group of this person. (1 mark)

……

……

(b) Name the antibodies found in blood of the following groups. (2 marks)

(i) Blood group A

……

……

(ii) Blood group AB

……

……

14. list three methods used to show energy flow through the ecosystem. (3 marks)

……

……

……

……

……

15. Name three organelles that would be abundantly present in secretory cells. (3 marks)

……

……

……

……

……

16. Give three ways in which the red blood cell is adapted to transport oxygen? (3 marks)

……

……

……

……

……

……

17. Describe how the leaves of submerged plants are adapted to gaseous exchange. (3 marks)

……

……

……

……

……

……

18. Name the part of the seed whose growth brings about epigeal germination. (1 mark)

……

……

……

19. State three aspects of light that affect the rate of photosynthesis. (3 marks)

……

……

……

……

……

20. (a) Identify the class with organisms that have three body parts and three pairs of legs. (1 mark)

……

……

……

(b) Suggest three reasons why members of the class named in (a) above are adapted to all types of habitats. (3 marks)

……

……

……

……

……

……

21. (a) List three types of gene mutation. (3 marks)

……

……

……

……

……

(b) (i) What are sex-linked genes? (1 mark)

……

……

……

……

……

……

(ii) Name two conditions that are sex-linked. (2 marks)

……

……

……

……

22. (a) State any two rules of binomial nomenclature. (2 marks)

……

……

……

……

……

(b) Define the term species. (2 marks)

……

……

……

……

……

23. (a) Name two digestive enzymes produced in their inactive form. (2 marks)

……

……

……

……

(b) Explain why the enzymes named in (a) above are produced in inactive form. (2 marks)

……

……

……

……

……

24. (a) Define immunity. (1 mark)

……

……

……

……

……

(b) Giving an example in each case, give two main types of immunity. (4 marks)

……

……

……

……

……

……

25. Identify three methods that cause fruit dispersal. (3 marks)

……

……

……

……

……

……

……

26. State three factors that increase the rate of traspiration. (3 marks)

……

……

……

……

……

**NAME**_____ **INDEX NO.**_____

**DATE**_____ **ADM**_____

**DATE.**_____ **SIGN**_____ **TARGET**_____

**231/1**

**BIOLOGY**

**PAPER 1**

**TIME: 2 HOURS**

# SERIES 8 2024 KCSE MOCK

*(Kenya Certificate of Secondary Education)*

**BIOLOGY THEORY**

For examiner's use only

| QUESTION | MAXIMUM SCORE | CANDIDATE'S SCORE |
|---|---|---|
| 1 - 29 | 80 | |

*This paper consist of 11 printed pages.*

*Candidates should check the questions to ascertain that all the pages are printed as indicated and no questions are missing.*

1. The study of biology enhances international cooperation, as countries work together to solve environmental problems. Name 2 biology related international conventions that help solve environmental problems. (2 marks)

……

……

……

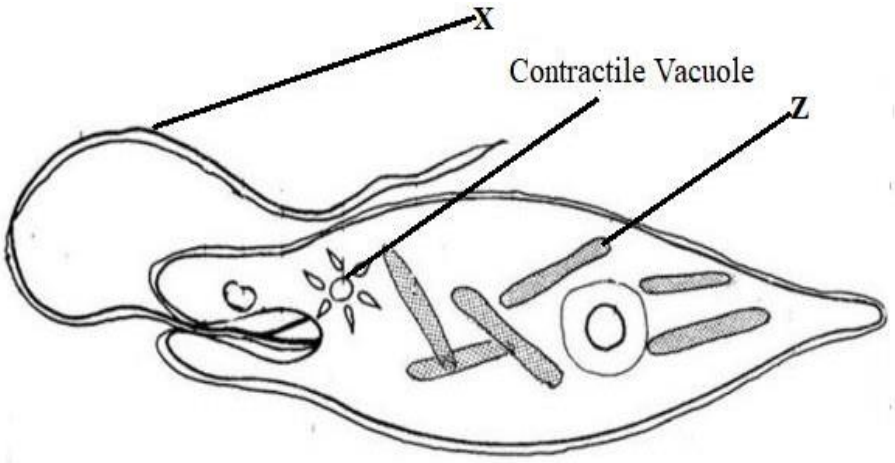
……

2. A zebra is observed to be grazing at a grassland. Apart from **nutrition**, name **one** other characteristic of living things observed on the zebra as it grazes. (1 mark)

……

……

3. The diagram below represents an organism. Study it and answer the questions that follow.




a) Identify the kingdom to which the organism belongs (1 mark)

……

……

b) Name the structures labelled X (1 mark)

……

……

c) Identify the type of nutrition carried out by the organism and give a reason (2 marks)

Type of:

Nutrition

……

……

Reason

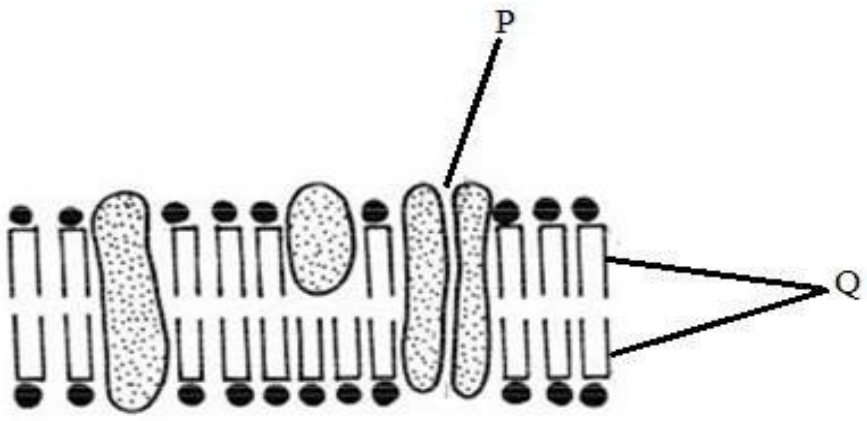
……

……

……

……

4. The diagram shown represents part of a cell.




d) Identify the structure (1 mark)

……

……

e) Label the following parts: (2 marks)

P……

Q……

5. Name the following organelles. (3 marks)

c) Contains chromatin material

……

……

d) Forms spindle fibres

……

……

e) Digests pathogens that enter the cell

……

……

6. The bacterium that causes typhoid is known as salmonella typhi.

a) Write the scientific name correctly (1 mark)

……

……

b) State the main mode of transmission of the above organism. (1 mark)

……

……

7. Three stems of *tradescantia* of equal length were placed in three solutions of different concentrations. The set ups were left to stand for 30 minutes. The results were recorded in the table below.

| Solution | Initial length of stem (mm) | Final length of stem (mm) |
|---|---|---|
| A | 37 | 37 |
| B | 37 | 35.2 |
| C | 37 | 39.7 |

32. Describe the nature of solution **A** in relation to the final length of the tradescantia stem. (1mark)

……

……

**33.** Explain the observation that was made on the tradescantia stem which was put in solution **B.** ( 2marks)

……

……

……

……

**34.** State what would happen to red blood cells if they were placed in solution **C.** (1 mark)

……

……

35. A KASSUME researcher found out that oxygen concentration and sugar consumption is directly related to potassium ion uptake in wheat roots. Name the process by which potassium ions is taken by the roots. Give a reason for your answer ( 2 marks)

……

……

……

……

8. The diagram below is an experiment that was carried out to investigate a certain biological process. Study it an answer the questions below.

d.) What is the aim of the experiment? ( 1mark)

……

……

e.) Which specialised tissue was removed in the above experiment? ( 1mark)

……

……

f.) How is the tissue named above adapted to perform its function? ( 1mark)

……

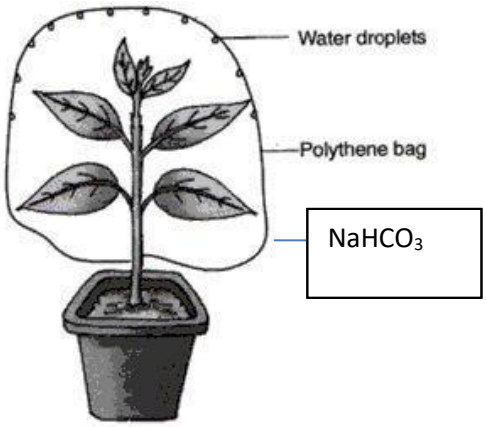
……

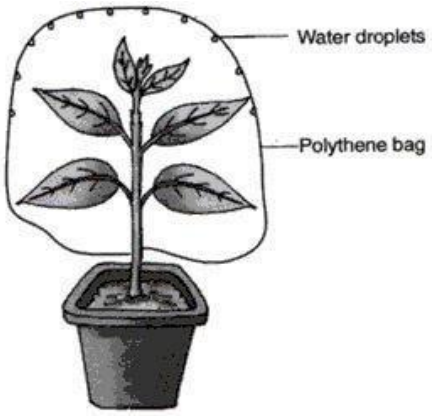
g.) Predict in diagrammatic form the fate of the trunk after 3 weeks? ( 1 mark)

……

……

9. Two potted plants A and B that had been kept in dark for 48 hours were placed in polythene bags.




**set up A** **Set up B**

Into set up A, a dish of sodium hydroxide was placed inside the polythene bag. In the set up of plant B, a dish of sodium hydrogen carbonate was similarly placed. The plants were then placed in sunlight for six hours. After six hours a leaf from each plant was tested for starch.

(a) What is the expected results for **set up A** (1 mark)

……

……

(b) What was the purpose of:

c) Sodium hydroxide (1 mark)

……

……

……

……

d) Sodium hydrogen carbonate. (1 mark)

……

……

(c) What would have been the case if neither sodium hydroxide nor sodium hydrogen carbonate were placed in the set up? (1 mark)

……

……

(d) State the purpose of this experiment. (1 mark)

……

……

(e) Explain how the teeth of a lion are adapted to carnivorous mode of feed. (2 marks)

……

……

……

……

10. Explain how emotional state of the body affect heart beat rate. (1 mark)

……

……

……

……

11. (i) What is meant by immune response? (1 mark)

……

……

12. (ii) Name one cell responsible for immune response in a human being. (1 mark)

……

……

13. Describe the mechanism of closing the stomata on the basis of photosynthetic theory (3 marks)

……

……

……

……

……

……

14. Explain how the floating aquatic plants are adopted of gaseous exchange. ( 1 mark)

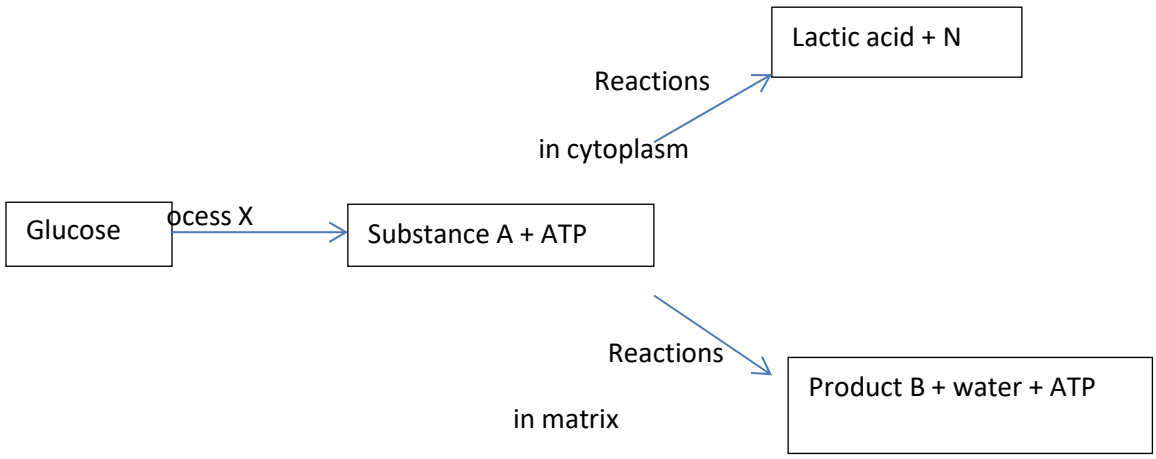
……

……

……

……

15. The chart below shows a summarized process that occurs in animals.




(a) Name the: (3 marks)

**(c)** Process X ……

**(d)** Substance A ……

**(e)** Product B ……

(b) State the condition necessary for the reactions in matrix to occur. (1 mark)

……

……

16. Explain the roles of the following plant hormones

(i) Gibberellins (3 marks)

……

……

(ii) Ethylene (2 marks)

……

……

(a) Define the first law of heredity as postulated by Gregor Mendel (1 mark)

……

……

……

……

(b) A common species of rats has individuals with white, black or grey coats. During a study, a rat with white coat was crossed with a rat with black coat. Both parents were pure lines. All the offspring in F1 generation had grey coats. The F1 offspring were selfed to get F2. Using letter B to represent the gene for black coat and W for white coat, work out the phenotypic ratio of F2 offspring. Show your working.

(4 marks)

……

……

……

……

……

……

17. What is meant by the following terms

(a) Natural selection (2 marks)

……

……

(b) Struggle for existence

……

……

18. Despite the best efforts to make and use the most effective pesticides, bedbugs have not been eradicated from most homes. Give an explanation for this observation. (2 marks)

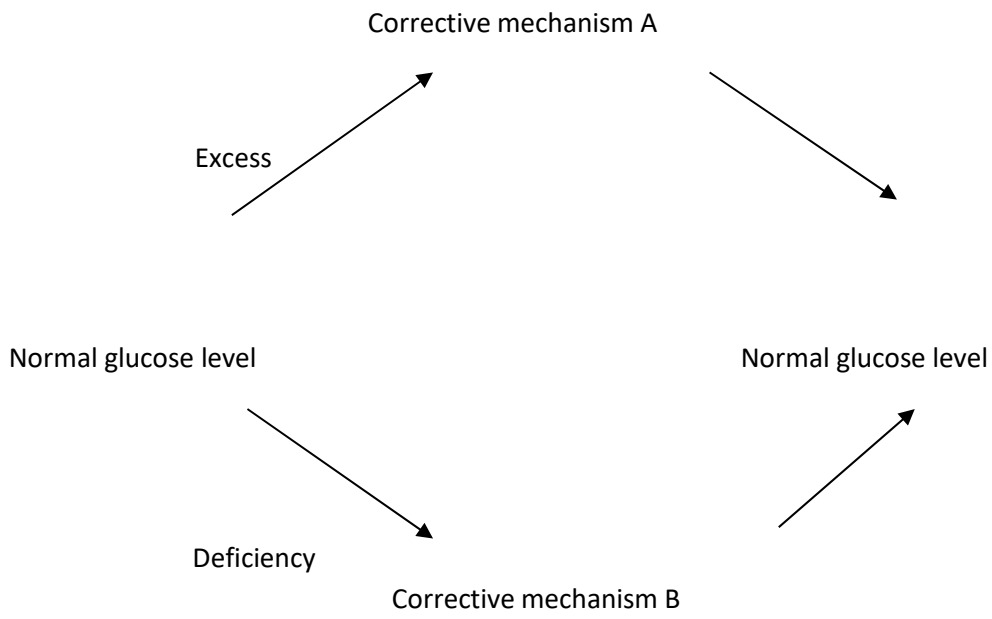
……

……

……

……

19. The diagram below illustrates the mechanism of blood glucose concentration




(a) What principle of homeostasis is illustrated in the diagram? (1 mark)

……

……

(b) (b) Name the condition that may result from further excess (1 mark)

……

……

(c) State how the corrective mechanism B restores blood glucose to normal level (2 marks)

……

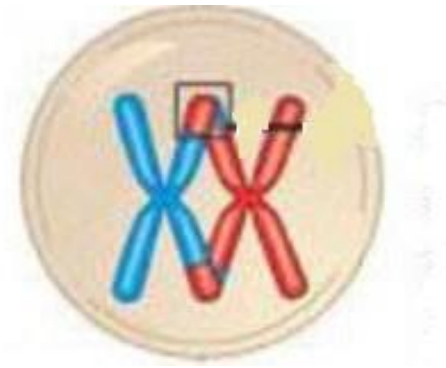
……

……

……

(c)

20. The diagram below shows a stage in cell division



(a) Name the type of cell division? (1 mark)

……

……

(b) Give **two** reasons for your answer in (a) above (2 marks)

……

……

……

……

State **two** differences between the end products of mitosis and meiosis (2 marks)

……

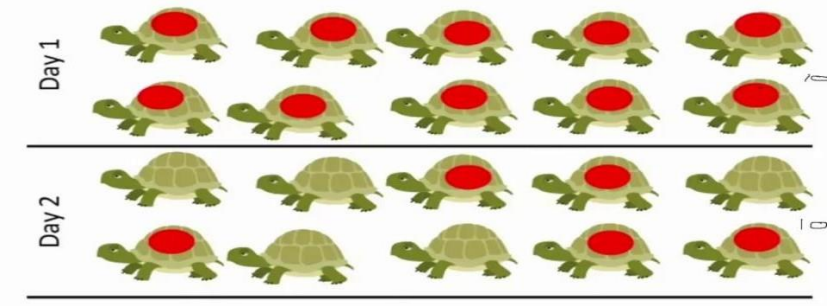
……

……

……

……

21. Study the diagram below and use to answer the questions that follow;




a) Identify the sampling method illustrated. (1 mark)

……

……

b) Describe how the sampling method above was used to estimate the population of organisms (4 marks)

……

……

……

……

……

……

c) Give any **two** assumptions that would be made when estimating the population the named organism in (a) above (2 marks)

……

……

……

……

……

……

d) Differentiate between the terms; habitat and ecological niche (1 mark)

……

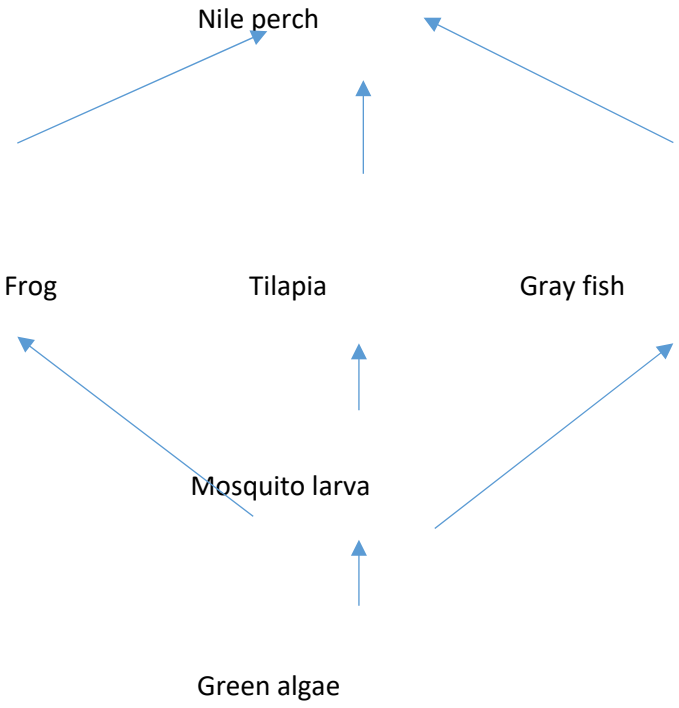
……

……

……

……

22. Study the food relationship below and answer the questions




a) State the ecosystem from which the above food web was obtained (1 mark)

……

……

b) What will be the effect of increased fishing of nile perch on the number of malaria cases.

(2 marks)

……

……

……

……

c) How is malaria transmitted from infected person to a healthy person (1 mark)

……

……

d) What will be the benefit of controlling malaria in the above ecosystem using biological control (2 marks)

……

……

……

……

**NAME**_____ **INDEX NO.**_____

**DATE**_____ **ADM**_____

**DATE.**_____ **SIGN**_____ **TARGET**_____

**231/1**

**BIOLOGY**

**PAPER 1**

**TIME: 2 HOURS**

# SERIES 9 2024 KCSE MOCK

*(Kenya Certificate of Secondary Education)*

**BIOLOGY THEORY**

For examiner's use only

| QUESTION | MAXIMUM SCORE | CANDIDATE'S SCORE |
|---|---|---|
| 1 - 29 | 80 | |

## INSTRUCTION: ANSWER ALL QUESTIONS IN THE SPACES PROVIDED

1. Some form one students wanted to collect the following animals for study in the laboratory. State the suitable apparatus they should use.

i) Housefly (1 mk)

……

……

……

ii) Scorpion (1 mk)

.

……

……

……

iii) Ants (1 mk)

.....

.....

A student was viewing a slide preparation of an onion cell under high power of a light microscope and observed that the features of the cell were blurred.

- Name the part of the microscope that the student would use to obtain sharper focus of the features. (1mk)

.....

.....

State the function of mirror in a light microscope. (1mk)

.....

.....

(a) Guard cells are specialized epidermal cells. State **two** structural features which suit them to their function. (2mks)

.....

.....

.....

.....

(b) Apart from gaseous exchange, give one other function of stomata. (1mk)

……

……

(f) The diagram below is a specialized mammalian cell.


f.) Name the parts labeled B and D
(2mks)

B……

D ……

g.) State the function of the following

36. Part labeled A (1mk)

……

……

37. The portion marked C (1mk)

……

……

(g) Give **two** roles of the colon in human digestive system. (2marks)

……

……

(h) Distinguish between dentition and dental formula. (2marks)

……

……

(i) Name a carbohydrate that is abundant in the following;

a. Ripe fruits. (1mark)

.....

.....

b. Blood of vertebrates. (1mark)

.....

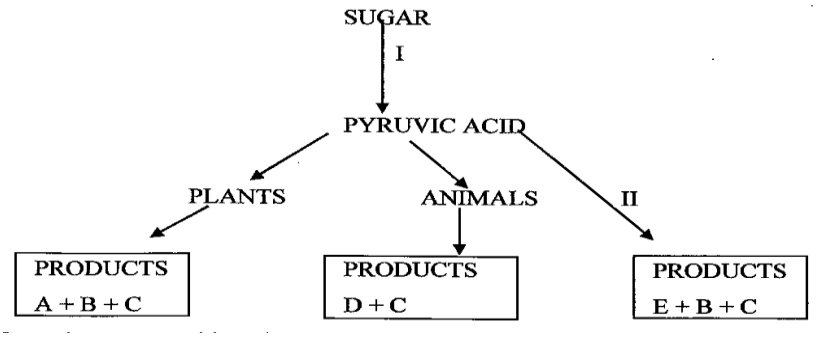
.....

(j) Apart from photosynthesis identify one other function of chloroplasts in plants. (1mark)

.....

.....

(k) Study the flow chart below and answer the questions that follow.




h.) Name the process taking place in step labeled I (1mk)

.....

.....

i.) Give **two** reasons why accumulation of substances D in the body leads to an increase in the heart beat. (2mks)

.....

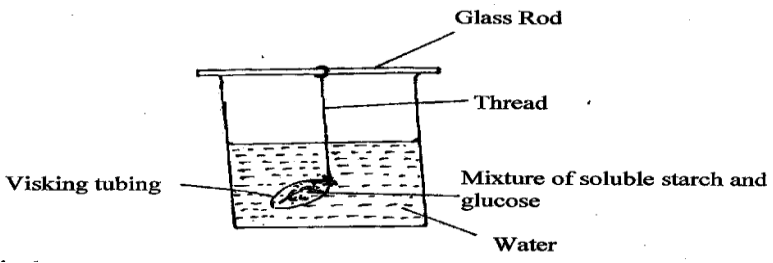
.....

j.) Identify substance E (1mk)

.....

.....

(l) In an experiment to investigate a certain physiological process, a student had his experimental set up as shown below.




To ascertain the occurrence of the physiological process investigated he carried out food test on the water in the beaker. Both starch test and reducing sugar test at the beginning of the experiment were negative. After the set up was left undisturbed for 20 minutes, starch test was still negative but that of reducing sugar was positive.

c) tate the physiological process which takes place in the human body illustrated by the set up above. (1mk)

.....

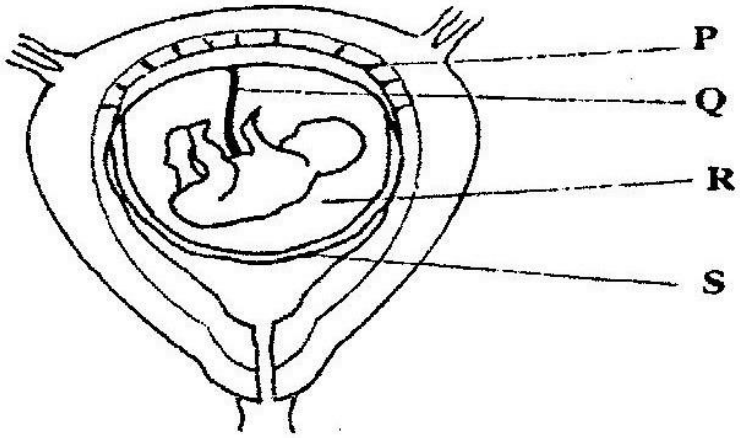
.....

d) Name the part of the human body where the processes stated in (a) above takes place. (1mk)

.....

.....

(m) Study the diagram below and answer the following questions.




State the function of the part labeled **Q**. (2marks)

.....

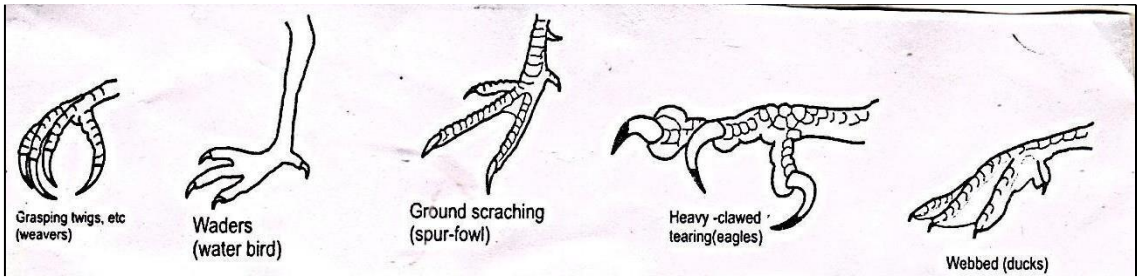
.....

Identify a hormone produced by part labeled **P**. (1mark)

……

……

(n) Study the diagram below and answer the questions that follows




6. What type of evolution is illustrated by the limbs (1mk)

……

……

7. What does the origin of the limbs suggest about the ancestry of these animals (1mk)

……

……

(c) (i.) What are vestigial structures?
(1mk)

……

……

13. An investigation was carried out on a terrestrial ecosystem. The population sizes and species biomass were determined and recorded as shown in the table

| Species | Population size | Species biomass |
|---|---|---|
| A | $1\times10^{3}$ | $1\times10^{3}$ |
| B | $1\times10^{3}$ | $1\times10^{-1}$ |
| C | $1\times10^{5}$ | $1\times10$ |
| D | $1\times10$ | $1\times10^{4}$ |

f) If these organisms had feeding relationships, construct a simple food chain involving all the organisms (1mk)

……

……

g) Construct pyramid of numbers using the data provided above. (2mks)

.....

.....

.....

.....

14 Study the photograph below showing a certain trait in man.

i. Identify the trait exhibited in the photograph above. (1 mark)

.....

.....

ii. The trait you have identified in (d) (i) above is **sex linked**. In which chromosome is it contained.

(1 mark)

.....

.....

38. Name any other sex linked trait in man. (1 mark)

.....

.....

15 . (a)State **one** significance of genetics counseling (1mk)

……

……

(b) Part of a strand of DNA molecules was found to have the following sequence
A-T-C-G-G-G-A-T-C-T.

What is the sequence?

19. Of the complementary strand? (1mk)

……

……

(ii) On a m- RNA strand copied (1mk)

……

……

16. (a) State **two** significance of myelin sheath. (2mks)

……

……

……

……

(b) Name the cell that secretes the myelin sheath. (1mk)

……

……

(c) List the following in order in which they are involved in a simple reflex action.
Motor neurone, effectors, stimulus, intermediate (relay) neurone, sensory neuron, impulse, receptor. (1mk)

……

……

17. If the fish is removed from water it dies immediately. Explain why (2mks)

……

……

……

……

18 .a) What is seed dormancy (1Mk)

……

……

h) Name a growth inhibitor in seed (1Mk)

……

……

i) Differentiate between hypogeal and epigeal germination in seeds (2Mk)

……

……

19. Name the causative agent of the following diseases in man (2Mks)

a) Candidiasis :-……

b) Syphilis:-……

20. A group of form two students placed a fresh leaf in warm water. They observed that air bubbles formed on the surface of the leaf.

a) What biological process were they investigating? (1mk)

……

……

b) Name the structures from which the air bubbles were coming from. (1mk)

……

……

c) Explain the distribution of the structures named in (b) above on the leaf surfaces of an aquatic plant. (2mks)

.....

.....

.....

.....

.....

.....

21. **Differentiate between hydrolysis and condensation.** (2mks)

.....

.....

22. (a) Which sets of teeth would be used in chewing sugarcane for maximum extraction of sap? (2mks)

.....

.....

.....

23. In an experiment to determine the population of Tilapia fish in a school fish pond, students of Canada school decided to use capture-recapture method.

a) Name three vital tools the students would need for the exercise. (3mks)

.....

.....

.....

.....

b) State two factors that might affect the accuracy of their results. (2mks)

.....

.....

.....

24. What is the role of the following hormones in human reproduction?

i) Follicle stimulating hormone in male (lmk)

.....

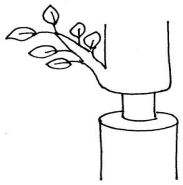
.....

ii) Luteinizing hormone during menstrual cycle. (lmk)

.....

.....

25. Below is representation of an experiment that was carried out on a tree in Kayombe forest.



a) Which two tissues are removed in a ring bark experiment? (2mks)

.....

.....

b) Removal of the tissues above leads to some effects to the plant. Name these 2 effects. (2mks)

.....

.....

.....

26. Explain why Lamark's theory of evolution is not accepted by modern scientist.
(2mks)

.....

.....

.....

.....

27. Name the branch of biology that deals with;

a) Relationship between antelopes and gazelles in their environment. (lmk)

.....

.....

b) Study of Ebola virus. (lmk)

.....

.....

c) Explain what would happen if a given of living things lose their ability to reproduce. (lmk)

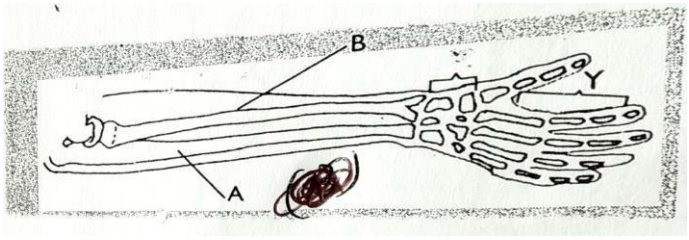
.....

.....

.....

.....

28. Study the diagram below and answer the questions that follow.




(c) Identify the bones labelled A and B. (2marks)

A ……..

B ……..

(d) Name the joints found in the region labelled Y. (1mark)

.....

.....

29.. (a) Explain the role of oxygen in Active transport (1mk)

……

……

(b) Name **two** processes that depend on Active transport in animals (2mks)

……

……

……

……

**NAME**_____ **INDEX NO.**_____

**DATE**_____ **ADM**_____

**DATE.**_____ **SIGN**_____ **TARGET**_____

**231/1**

**BIOLOGY**

**PAPER 1**

**TIME: 2 HOURS**

# SERIES 10 2024 KCSE MOCK

*(Kenya Certificate of Secondary Education)*

**BIOLOGY THEORY**

**FOR EXAMINER'S USE ONLY**

| QUESTION | MAX. SCORE | CANDIDATE SCORE |
|---|---|---|
| 1 – 31 | 80 | |

1. A form one girl observed a bird laying eggs in a nest which later hatched into chicks. Name two characteristics of living things that she concluded from the observations (2marks)

……

……

2. Name the stage in meiosis where chromosomes number is reduced by a half (1mark)

……

……

3. State two characteristics of organisms that belong to the same species (2marks)

……

……

4. a) Live specimens should always be returned to their habitats whenever possible. What is the biological importance of this practice? (1mark)

……

……

b) Why is a dissecting pin important in biological experiments? (1mark)

……

……

5. Mutations form basis for variations. Name the type of mutation that cause the following human disorders

(a) Albinism

(2marks)

……

……

……

……

(b) Down syndrome

……

……

6. a) During a field trip a plant that had flowers drew the attention of a student. Name the division of the plant.

……

……

(1mark)

b) Students observed an animal with the following features

39. Dorsoventrally flattened body
40. One pair of legs per segment
41. Poison claws on the head

- Name the class to which the animal belongs. (1mark)

……

……

- State the mode of feeding of the animal
  (1mark)

……

……

7. Study the process below and answer the questions that follow

Glucose $\xrightarrow{\text{process P}}$ Pyruvic acid + Energy.

vii) Name the process P

(1mark)

……

……

viii) Name the part of a cell in which the process named in (a) above occurs (1mark)

……

……

8. Account for the following observations.

a) When fish is taken out of water it dies (2marks)

……

……

ix) The palisade cells are closely packed together (1mark)

……

……

9. a) Give the significance of the following features of the red blood cells.

Being biconcave in shape. (1mark)

……

……

b) Lacking mitochondria ( 1mark)

……

……

10) A person fell from the third floor of a building and had part of his brain damaged. Name the part of the brain damaged if the person suffers from the following

a) Loss of speech (1mark)

……

……

b) Inability to regulate body temperature (1mark)

……

……

c) Lack of balance (1mark)

……

……

11. In body cells of all organisms chromosomes occur in pairs. Members of each pair have a characteristic length and shape.

a) What is the scientific name of such a chromosome pair? (1mark)

……

……

b) What name is given to a cell that contains one member of each pair of chromosomes? (1mark)

……

……

……

……

c) Name the part in humans where meiosis takes place (2marks)

……

……

……

……

12. Small birds like the European robin puff up (swell up) their feathers during winter. Explain the significance of the behavioral response. (3marks)

……

……

……

……

……

……

13. Name the most appropriate tool that biology students can use for collecting (2marks)

i) Crawling animals

……

……

ii) Stinging organisms

……

……

14. During a microscopy class a student was unable to see the field of view. State two possible adjustments she needed to make to ensure that the field of view became visible. (2marks)

……

……

……

……

15. Name the apparatures used to measure the following abiotic factors.
(2marks)

i) Penetration of light in water

……

……

ii) Light intensity

……

……

16. A lion is an exclusive carnivore. State two dental adaptations it has to its mode of feeding (2marks)

……

……

……

……

17. a) State an example of structures in animals whose development demonstrates adaptive radiation (1mark)

……

……

……

……

b) Treatment of malaria is still a challenge in the world despite the invention of many antimalarial drugs. Explain.
(3marks)

……

……

……

……

18. Name two processes that brings about the translocation of manufactured food (2marks)

……

……

……

……

19. Name the disorder of the blood described by the following symptoms
(2 marks)

a) In ability of the blood to clot.

……

……

b) Crescent shaped red blood cells with abnormal haemoglobin.

……

……

20. Explain how a nerve impulse is passed across a synapse (3marks)

……

……

……

……

21.a) A large crocodile can survive on 20kg meat for a year. A small sized lion cannot. Explain (3marks)

……

……

……

……

b) Name the part of the body that helps in insulation in the following:
(2marks)

i) Birds

……

……

ii) Mammals

……

……

22. Name **two** types of valves in the heart.
(2 marks)

……

……

23. Sometimes when one stands up very quickly after a long period of sitting, she may feel faint or dizzy. Explain. (2 marks)

……

……

24. The diagram below represents a bone of a mammal

(a) Identify the bone. (1 mark)

……

……

(b) Name the part marked **X**. (1 mark)

……

……

(c) Name the bone that articulates at the part labelled **F**. (1 mark)

……

……

(d) State two ways in which the bone is adapted to its function. (2 marks)

……

……

25. a) Under which of the following magnifications would one see a larger part of the specimen X 40 or X 500? Give a reason. (2 marks)

……

……

……

……

b) State how magnification is worked out in a light microscope (1mark)

……

……

26. State two characteristics of mammals that are not externally visible
(2marks)

……

……

……

……

27. State three uses of digested food in the bodies of animals (3 marks)

……

……

28. Which cell organelle is present in large numbers in cells that produce Insulin? Give a reason for your answer (2marks)

……

……

……

……

29. Give three advantages of fossil records (3marks)

……

……

……

……

30. What is the significance of diffusion to plant pollination? (1mark)

……

……

31.a) Explain why it is not advisable to put a patient on a drip of distilled water for rehydration (3marks)

……

……

……

……

……

……

b) Name the physiological process by which water molecules move from one cell to the other (1mark)

……

……

……

……

……

……