

Name..... Index No...../.....

School..... Candidates Signature.....

Date

231/1

BIOLOGY

THEORY

Paper 1

2 Hours

BUTULA SUB-COUNTY EXAMS – 2021 DECEMBER.

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

INSTRUCTIONS TO CANDIDATES

- Write your **Name** and **Index Number** in the spaces provided above.
- **Sign** and write **Date** of examination in the spaces provided above.
- Answer **ALL** questions in the spaces provided.
- All workings **MUST** be clearly shown where necessary.

For Examiners use only.

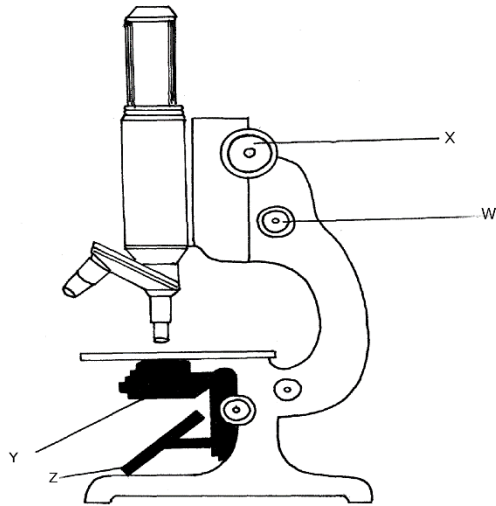
Question	Maximum Score	Candidates Score
1 – 27	80	

This paper consists of 11 Printed pages.

Candidates should check the question paper to ensure that all the

Papers are printed as indicated and no questions are missing

1. The diagram below represents common laboratory equipment.



a) Label the parts labeled X and Y. (2marks)

X

Y.....

b) Using arrows show how the object is illuminated. (2marks)

2. The Biological name of housefly is **MUSCA DOMESTICA**.

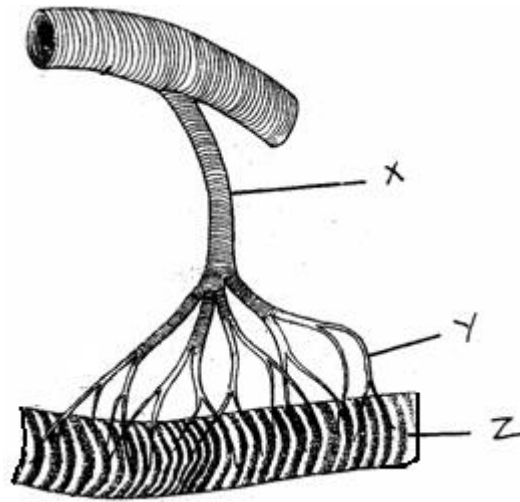
a) State **two** mistakes in the way the biological (scientific) name is written. (2marks)

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b) Write the name in the correct manner following the rules of binomial nomenclature. (1mark)

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3. . The diagram below show a structure used for gaseous exchange in an organism.



(a) Label parts. (3marks)

X

Y

Z

(b) State the adaptation of part labelled **Y**. (1mark)

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4. Name the type of response exhibited by.

(a) Leaves of *Mimosa pudica* when they fold their after being touched. (1mark)

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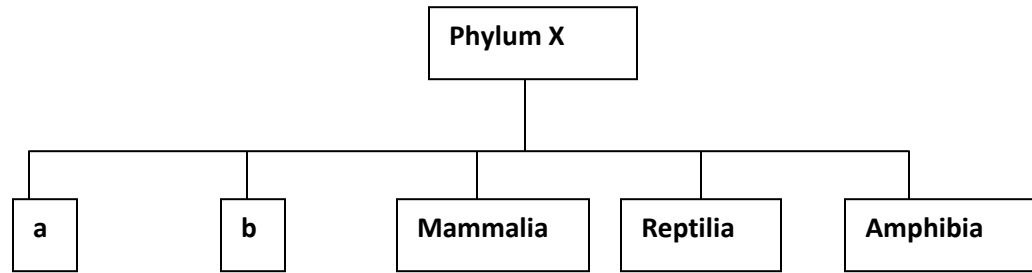
(b) Euglena when it swims towards the source of light. (1mark)

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(c) Sperm cell when it swims towards the ovum. (1mark)

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5. Study the diagram below and answer the questions that follows.



(a) What is the phylum **X**? (1mark)

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(b) Name the classes labeled **a** and **b**. (2marks)

a.....

b

6. (a) Define population (1mark)

.....

(b) From three students wanted to estimate the population of grasshoppers in 5km² grass field near a school compound. They captured 36 grasshoppers and marked them before returning them back to the field. After two days they made another catch of grasshoppers. They collected 45 grasshoppers of which only 4 had marks.

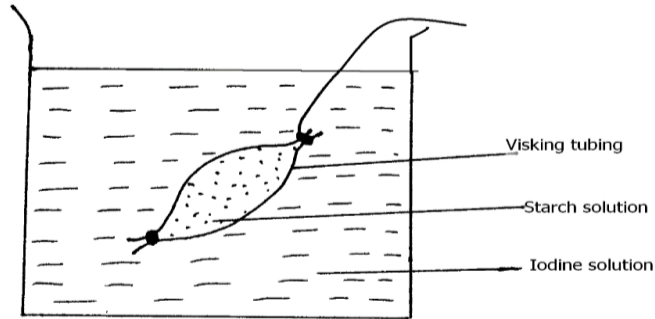
i) State why the second capture was done after two days. (1 mark)

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ii) From the data calculate the population size of grasshoppers in the grass field. (2 marks)

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7. The set-up below was prepared by form one students and left for 1 hour



They made the following observations

	At the start	After one hour
In visking tubing	White solution	Blue-black
In beaker	brown	brown

(a) Identify the physiological process being investigated (1mark)

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(b) Explain the observation made (3marks)

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8. The equation below represents a reaction that occurs during respiration in a cell.



(a) Identify the compound K. (1mark)

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(b) State **two** differences between **K** and **ATP**. (2marks)

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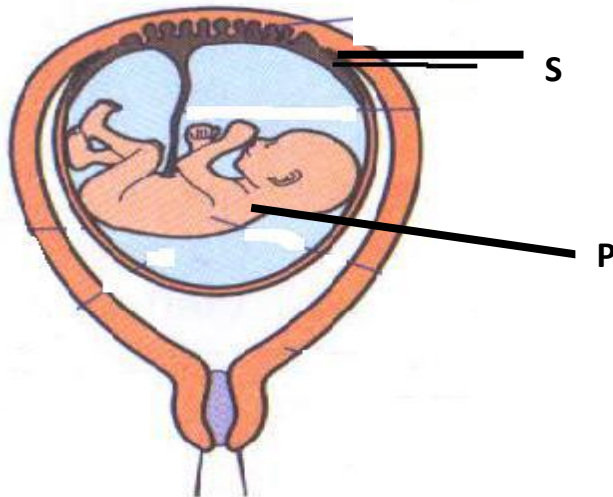
(c) Name the organelle responsible for the production of energy in a cell muscle (1mark)

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9. State **three** characteristics of cells at the zone of cell division in an apical meristem (3marks)

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10. The diagram below represents human foetus in the womb.



a) Name the part labeled S and P (2marks)

S

P

b) Give **two** reasons why you think the foetus is not yet due for birth (2marks)

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11. Explain how the biceps and triceps muscles bring about the movement at the hinge joint of the elbow in man. (2marks)

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12. Part of one strand of DNA molecule was found to have the following sequence

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

What is the sequence on a:

a) Complimentary DNA strand? (1mark)

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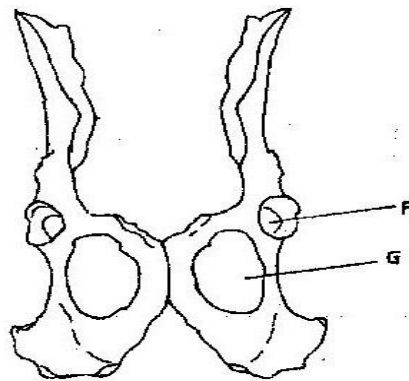
b) m-RNA strand copied from this DNA portion? (1mark)

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13. Name **two** features that increase the surface area of the small intestines. (2marks)

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14. The diagram below shows two fused bones of a mammal.



(a) Identify the fused bone. (1mark)

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(b) Name the parts labeled F and G (2marks)

F..... G.....

(c). Name the bone that articulates at the point labeled F. (1mark)

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15. A person was able to read a book clearly at arm's length but not at normal reading distance.

(a) State the defect the person suffered from? (1mark)

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(b) Why was he unable to read the book clearly at normal distance (1mark)

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(c) How can the defect be corrected? (1mark)

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16. Give **two** functions of saliva in human digestion process (2marks)

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17. During a strenuous exercise the chemical process represented by the equation below takes place in the human muscle cells.



(Substance X)

(a) Name the process represented above. (1mark)

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(b) Identify substance X (1mark)

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18. a) A mushroom research station would like to employ a researcher. Which scientist is most appropriate. (1mark)

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b) Name the branch of biology that deals with phylogenetic relationship between organisms. (1mark)

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19. Explain why plants absorb water in waterlogged soil but not mineral salts. (2marks)

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20. To control the spread of malaria, fish are introduced into water bodies near residential area.

a. Name this method of population control. (1mark)

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b. State an advantage of the above method. (1mark)

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21. Explain why resistance to antibiotics is considered an example of evolution. (2marks)

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22.a) People are encouraged to take the corona virus disease vaccine. How does it work.

(1mark)

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b) What is the significance of;

i. Red blood cells lacking mitochondria. (1mark)

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ii. Xylem vessels being dead. (1mark)

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23. A patient complained of frequent thirst. A sample of the patient's urine was found not to have any sugar.

a) Name the hormone the person was deficient of. (1mark)

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b) Name the gland that secretes the above hormone. (1mark)

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24. a) The paddles of a whale and fins of a fish adapt them to aquatic habitat.

i. Name the evolutionary process that may have given rise do these structures. (1mark)

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ii. What name is given to such structures. (1mark)

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b) State **two** advantages of natural selection. (2marks)

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25. a) Explain why ingestion of salty food may reduce the amount of water passed out in urine. (2marks)

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b) Explain why small birds puff their features when cold. (2marks)

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26. a) Explain why an effective respiratory system is associated with the circulatory system. (2marks)

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b) Distinguish between haemoglobin and myoglobin. (2marks)

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27. New born babies have a higher heart beat than adults. Explain why? (2marks)

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