**NAME:…………………………………………………INDEX NUMBER:………………..**

**SCHOOL………………………………………………ADM No:……………STREAM….**

**231/1**

**BIOLOGY**

**PAPER 1**

**MARCH- 2019**

**TIME: 2 HOURS**

**BURAMU I JOINT EXAMINATION -2019**

Kenya Certificate of Secondary Education

**INSTRUCTIONS TO CANDIDATES**

**Answer all the questions in the spaces provided in this paper.**

**FOR EXAMINER’S USE ONLY**

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| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** |
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| **18** | **19** | **20** | **21** | **22** | **23** | **24** | **25** | **26** | **27** |
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**Grand total**

1. The scientific name of a lion, wolf and leopard are *Panthera leo*, *Canis lupus* and *Panthera pardus* respectively. All the three belong to the family Carnivora,

a) Which of the organisms are closely related? (1 mark)

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b) What does *Canis* refer to? (1 mark)

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c) Explain why the lion and the leopard cannot procreate. (1 mark)

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2. Give the structure of the cell that performs the following functions.

a.) Synthesis of ribosomes. (1 mark)

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c.) Breakdown large molecules destroy worn out organelles. (1 mark)

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3. State the importance of each of the following in living organisms

a) Nutrition (1 mark)

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b) Excretion (1 mark)

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4. a) Define the term enzyme. (1 mark)

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b) Give one factor that affect the rate of enzyme activity. (1 mark)

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5. a) Name one defect of circulatory system in humans. (1 mark)

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

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6. State two ways in which floating leaves of aquatic plant are adapted for gaseous exchange. (2 marks)

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7. List the change that takes place during inhalation in the breathing cycle of mammal in the following.

a) Rib cage (2 marks)

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b) Diaphragm (1 mark)

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8. 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. (1 mark)

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

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

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9. a) State three characteristics of *Monera* that are not found in other kingdoms. (3 marks)

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b) Name the class to which a termite belongs. (1 mark)

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10 a) A student visiting a game park observed an adult elephant flapping its ears twice as much as its calf in order to cool its body when it is hot. Explain. (2 marks)

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b) Explain why some desert animas excrete uric acid rather than ammonia. (3 marks)

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11 (a) What is seed dormancy? (2 mark)

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b) Name two factors in the seeds that cause dormancy (2 mark)

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c) Differentiate between hypogeal and epigeal germination in seeds. (2 marks)

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| --- | --- |
| Hypogealgermination | Epigeal germination |
|  |  |
|  |  |
|  |  |

12 Name the causative agent of the following diseases in man.

a) Candidiasis. (1 mark)

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b) Syphilis. (1 mark)

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13. To estimate the population of tilapia using the capture recaptures method, 60 fish were captured and released. In the second capture out of 72 fish, 10had been marked. Calculate the estimated population of tilapia. (Show your working). (3 marks)

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(b) State three structural differences between the pulmonary artery and pulmonary vein.(3mks)

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15. Aerenchyma tissues and pneumataphores are found in plants occupying different habitats identify these habitats. (2marks)

Aerenchyma*………………………………………………………………………………………………*

Pneumataphores*…………………………………………………………………………………………*

16. What would happen to a red blood cell when placed in strong salt solutions? (2marks)

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17. The table below represents blood transfusion between blood donors and recipient complete the table using the keys ( ) to represent compatibility and (X) to represent incompatibility. (4marks)

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| --- | --- | --- | --- |
|  | **RECIPIENT** | | |
| **DONOR** | A | AB | O |
| B |  |  |  |
| AB |  |  |  |
| A |  |  |  |

18. Write the base sequence of messenger RNA (MRNA) that would be coded from DNA strand shown below. (2mark)

C\_\_\_\_\_\_\_\_A\_\_\_\_\_\_\_\_T\_\_\_\_\_\_\_\_\_\_G\_\_\_\_\_\_\_\_\_A\_\_\_\_\_\_\_\_G\_\_\_\_\_\_\_\_\_\_\_T

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19. State one use of each of the following excretory produced in plants. (2marks)

1. Colchicine

*……………………………………………………………………………………………………………………………………………………………………………………………………………………*

1. Papain

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20. After four months of pregnancy, the ovaries of a woman can be removed without terminating pregnancy. However during the first four months of pregnancy, the ovaries must remain intact if pregnancy is to be maintained. Explain this observation. (3marks)

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21. Define the following terms as used in genetics.

a) Allele. (2marks)

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b) Back cross. (2marks)

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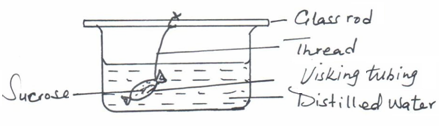
1. In an investigation, plants with red flowers were crossed with plants with white flowers; all the off springs had white flowers.
2. Give a reason for the appearance of pink flowers in the F1 generation. (2 marks)

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1. If the plants from the F1 generation were selfed, state the phenotypic ratio of the F2 generation. (2 mark)

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1. A student mashed a piece of ripe banana and made it into paste by adding water, placed the paste in a visking tubing and suspended it in a beaker containing iodine solution as shown below. The set- up was left for 40 minutes.



Ripe banana paste

Iodine solution

1. State the physiological process under investigation. (1 mark)

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1. Account for the result obtained in the set up at the end of the experiment. (3 marks)

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24. Name a method that could be used to estimate the population of:

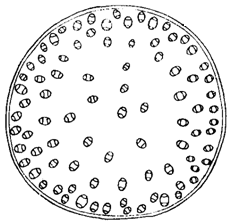
a) Black jack in a garden (1mark)

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b) Fish in a pond (1mark)

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25. The diagram below shows a transverse section of a plant organ.



1. Name the class to which the plant organ was obtained. (1mark)

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1. Give a reason for your answer in (a) above. (2mark)

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26. (a) Name the cell organelle in which anaerobic respiration occurs. (1mark)

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(b)During respiration energy is released gradually in small amounts, Explain. (2marks)

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1. (a) State **two** functions of bile juice in the digestion of food. (2marks)

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