**NAME:……………………………………… INDEX NO. ……………….…**

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**231/1**

**BIOLOGY**

**Theory**

**Paper 1**

**DECEMBER, 2020**

**Time: 2 Hours**

**LANJET JOINT EVALUATION EXAMINATION**

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

**231/1**

**Biology**

**Paper 1**

**DECEMBER, 2020**

**Instructions to Candidates**

* ***Write your name, admission number, class and signature in the spaces provided at the top of the page.***
* ***Answer all the questions in the spaces provided in this paper.***

**FOR EXAMINER’S USE ONLY**

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| --- | --- | --- |
| **Question** | **Maximum score** | **Candidate’s score** |
| **1-29** | **80** |  |

***This paper consists of 8 printed pages. Candidates should check the question paper to ascertain that all pages are printed as indicated and that no pages are missing.***

1. Which organelle would be numerous in the following cells? (2 mks)

(a) Liver cells

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(b) Palisade cells

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2. State the functions of the following cell structures during cell division. (2 mks)

(i) Centriole –

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(ii) Centromere –

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3. In an investigation, the pancreatic duct of a mammal was blocked. It was found that the blood sugar regulation remained normal while, food digestion was impaired. Explain these observations. (2 mks)

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4. State two structural differences between ribonucleic acid 9RNA) and deoxyribonucleic acid

(DNA). (3 mks)

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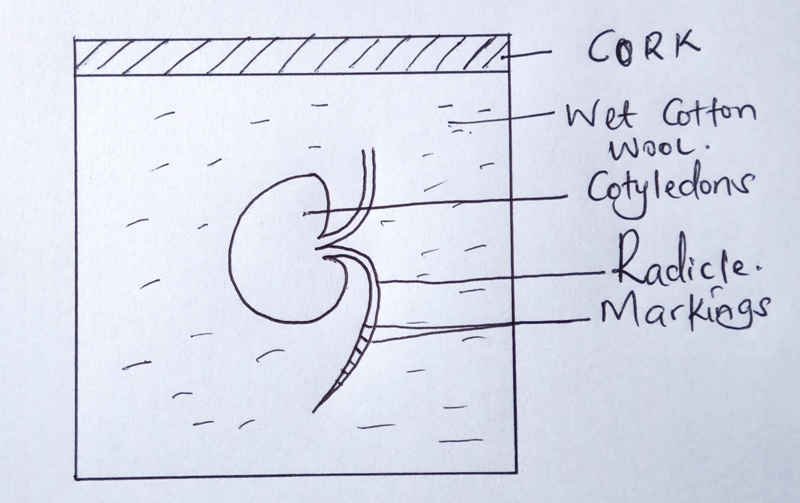
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5. Explain why glucose does not appear in urine of a healthy person even though it is filtered in

the Bowman’s capsule of a mammal. (2 mks)

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6. A student set up an experiment as shown in the diagram below .



(a) (i) What was being investigated in the experiment? (1 mk)

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(ii) Why was it necessary to have wet cotton wool in the container? (1 mk)

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(b) What is the role of the following in germinating seed? (2 mks)

(i) Oxygen –

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(ii) Cotyledon –

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7. Give a reason why it is only mutation in genes of gametes that influence evolution.

(1 mk)

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8. A person was able to read a book clearly at arm’s length, but not at normal distance.

(a) State the eye defect the person suffered from. (1 mk)

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

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

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9. Some form three students took a germinating maize grain and placed it in a starch paste in a petri dish and put the petri dish in a water bath maintained at 30oC . After 48 hours, the starch paste was irrigated with iodine solution. The area around the maize grain changed to the colour of iodine solution while the rest turned blue-black.

(a) Account for the observation. (2 mks)

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(b) Why was the petri dish put in a water bath maintained at 30oC? (1 mk)

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10. State two functions of muscles found in the alimentary canal of a mammal? (2 mks)

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11. State the stage in a cell division in which the following events occur:

(i) Replication of the genetic material. (1 mk)

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(ii) Exchange of genetic material. (1 mk)

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12. Explain what happens when a marine amoeba is transferred to fresh water environment.

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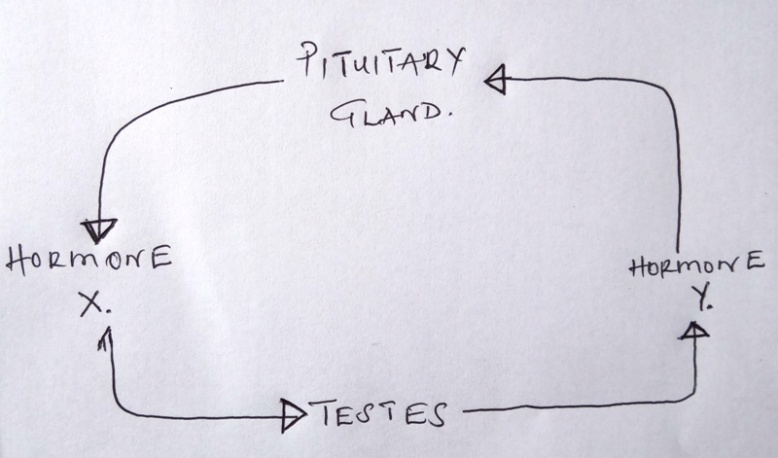
13. In blood test, a few drops of anti-B serum were added to two samples of blood. It was

noted that agglutination occurred. What were the possible blood groups of the two blood samples? (2 mks)

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14. The diagram below represents a simple endocrine feedback mechanism in a human male.



(a) Name the hormone labeled X. (1 mk)

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(b) State two differences that may be observed between a normal male and one who is incapable of producing hormone labeled Y. (2 mks)

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15. A small amount of chemical M was put on one side of maize coleoptiles. After some days, it was noted that the coleoptiles curved away from the side to which the chemical was applied .

(a) Suggest the possible identity of chemical substance M. (1 mk)

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(b) Explain how this chemical might have caused the coleoptiles to curve. (2 mks)

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16. In which part of the spinal cord is the cell body of the motor neurone found? (1 mk)

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(b) Below are two features which make aneurone a specialized cell. State their role.

(i) Axion –

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(ii) Dendrites –

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17. (a) What is a natural selection? (1 mk)

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(b) Distinguish between convergent and divergent evolution. (2 mks)

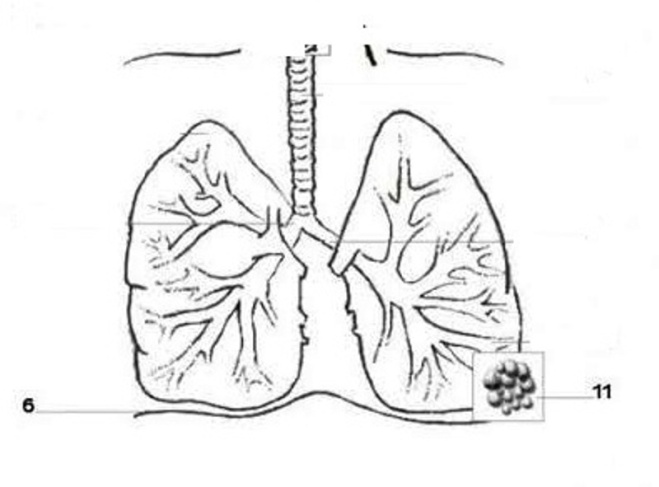
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18. The diagram below shows part of a mammalian respiratory system.



T

S

(a) Explain two ways in which the part labeled T is adapted to its functions. (2 mks)

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(b) How does the part labeled S facilitates inhalation ? (1 mk)

19. (a) Explain why the body temperature of a healthy human being must rise up to 39oC on humid day. (2 mks)

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(b) In an experiment, a piece of brain was removed from a rat. It was found that the rat had large fluctuation of body temperature. Suggest the part of the brain that had been removed. (1 mk)

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20. Name the distinguishing features of class mammalian. (3 mks)

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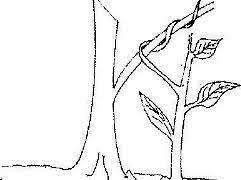
21. State three types of asexual reproduction and give its examples. (3 mks)

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22. The figure below shows a tendril of a plant growing around a trunk.



(a) Identify the types of response which causes the twisting growth. (1 mk)

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(b) Explain how the twisting process is accomplished. (3 mks)

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24. Active yeast cells were added to a dilute sugar solution in a container. The mixture was kept in warm room. After a few hours bubbles of gas were observed escaping from the mixture.

(a) Write an equation to represent the chemical reaction above. (1 mk)

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(b) What is the economic importance of this type of chemical reaction above? (1 mk)

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(c) Why is that the total energy being released at the end of respiration (oxidation) being released in a small quantity. (1 mk)

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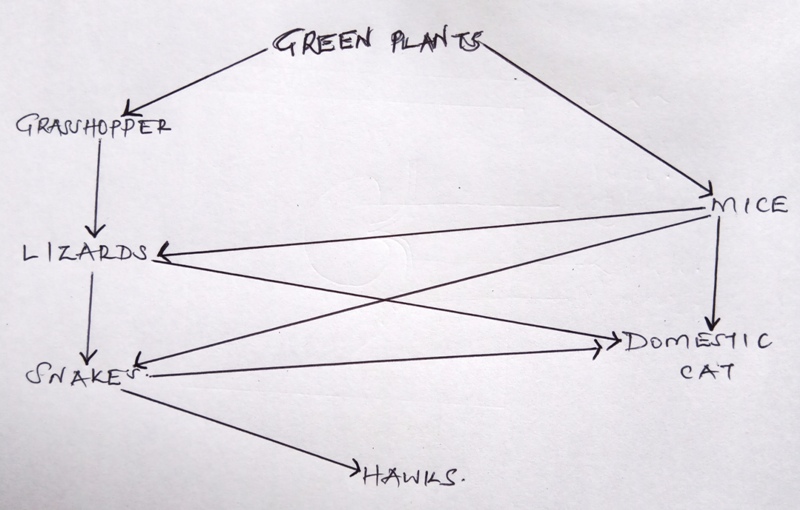
25. Describe three roles or active transport in living organisms. (3 mks)

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26. The diagram below shows a feeding relationship in a certain ecosystem.



(a) Construct two food chains ending with a tertiary consumer in each case. (2 mks)

(b) Suggest three ways in which the ecosystem would be affected if there was prolonged drought. (3 mks)

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27. Explain how the following parts of a mammalian reproductive system are adapted to their functions:

(i) Testis (1 mk)

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(ii) Uterus (1 mk)

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(b) Explain why removal of the ovary after four months of pregnancy does not terminate pregnancy. ( 1 mk)

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28. (a) What is meant by double fertilization in flowering plants. (2 mks)

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(b) State two advantages of cross pollination in a flowering plant. ( 2mks)

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29. Name the division in kingdom plantae with the following spore producing bodies

(i) Capsule

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