

Name: ..... Index No: .....

School: ..... Date: .....

231/1

**BIOLOGY**

Paper 1

**Time: 2 Hours**

## **MACHAKOS COUNTY KCSE TRIAL & PRACTICE EXAMINATION 2015**

*Kenya Certificate of Secondary Education*

**BIOLOGY**

Paper 1

**Time: 2 Hours**

### **INSTRUCTIONS TO CANDIDATES:**

- Write **your name** , **Index Number** and **School** in the spaces provided above.
- Answer **all** the questions in this question paper.
- Answers **must** be written in the spaces provided in this booklet.
- All answers must be written in English
- This paper consists of 11 printed pages. Candidates should check to ascertain that all papers are printed as indicated and that no questions are missing

### **EXAMINER'S USE ONLY**

Question	Maximum score	Candidate's score
1- 30	80	

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*A special Performance Improvement Project  
By His Excellency Dr. Alfred Mutua  
Sponsored by the County Government of Machakos*

Turn over

1. What do the following branches of Biology entail?

(a) Cytology

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(b) Entomology

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2. State TWO characteristics of kingdom Monera that are not found in other kingdoms. (2marks).

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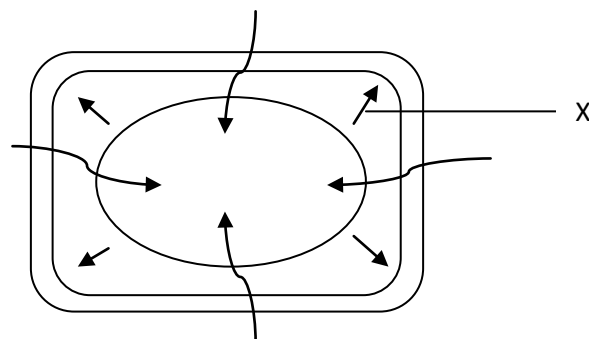
3. Two species in an ecosystem cannot occupy the same niche. Explain. (1 mark)

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4. State the significance of metamorphosis to the life of insects. (2 marks)

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5. The diagram below shows results of what happens to plant cell when placed in a certain solution.



a) What was the nature of the solution in which the cell was placed? (1 mark)

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b) Identify the force represented by the arrow X and explain how it develops.

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6. Which organelle would be numerous in the following cells; (2 marks)

a) Liver cell

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b) Palisade cell

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7. The scientific names of three animals leopard, wolf and lion in the family carnivora are; Panthera pardus, Canis lupas and Panthera leo respectively.

a) Why are scientific names given in Latin? (1 mark)

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

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c) Giving a reason, state the organisms that are MOST closely related. (1 mark)

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8. The word equation below shows a biological process.

Water  $\longrightarrow$  Hydrogen atom + oxygen

a) Name the process. (1 mark)

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b) Where does the process named in a) above take place? (1 mark)

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c) State two conditions necessary for the process to occur. (2 marks)

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9. a) What is the importance of heartbeat in blood circulation?

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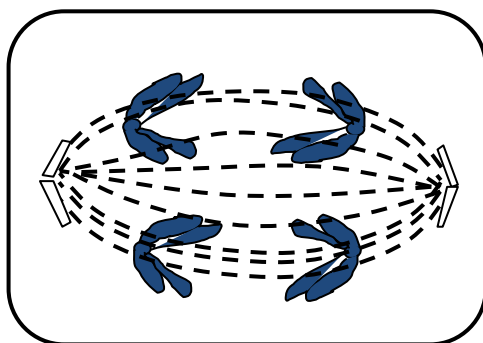
b) If the nerve supply to the heart of a mammal is severed, the rhythmic heart movement will still go on and the heart continues to beat. Explain this observation. (1 mark)

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10. The ovaries of an expectant woman can be removed after the first four months of pregnancy without terminating the pregnancy. Explain. (2 marks)

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11. The diagram below represents a stage during cell division.



a) Name the stage of cell division. (1 mark)

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.....

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

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c) State the significance of this stage of cell division in living organisms. (1 mark)

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12.) Name the causative agent for the following diseases;

a) Typhoid

(1 mark)

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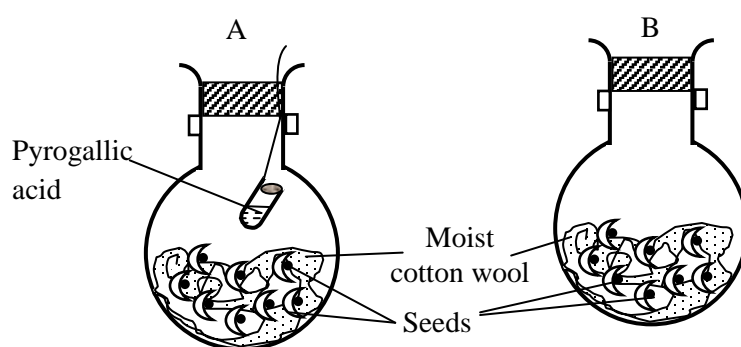
b) Syphilis

(1 mark)

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13. A student set up an experiment as shown in the diagram below. The set up was kept at room temperature for one week.



a) What was the aim of the experiment?

(1 mark)

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b) State the expected observation at the end of the experiment.

(2 marks)

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c) Account for the observation made in set up A.

(1 mark)

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14. a) Name the respiratory surface for gaseous exchange in insects.

(1 mark)

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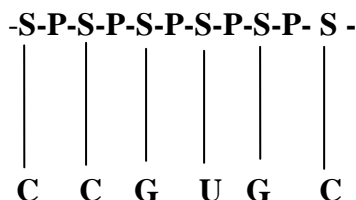
b) State two adaptations of the site named in a) above.

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15. A portion of a nucleic acid is shown below;



a) Name the nucleic acid to which the portion belongs. Give a reason. (2 marks)

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b) Write down the sequence of bases of a complimentary strand to the one above. (1 mark)

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16. Explain the meaning of the following terms;

a) Basal Metabolic Rate (1 mark)

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b) Oxygen Debt (1 mark)

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17. In an experiment, the concentration of ions in the cell sap of reeds growing in a swampy area and the water in the swamp were determined. The data below was obtained. Study it and answer the questions that follow:

Sample	Na <sup>+</sup>	Mg <sup>2+</sup>	Cl <sup>-</sup>	SO <sub>4</sub> <sup>2-</sup>
Cell sap	50	11	101	13
Swamp water	1.2	30	10.2	0.67

a) Name the process by which uptake of the following ions by the reeds occurs. (2 marks)

Na<sup>+</sup> ions .....

Mg<sup>2+</sup> ions .....

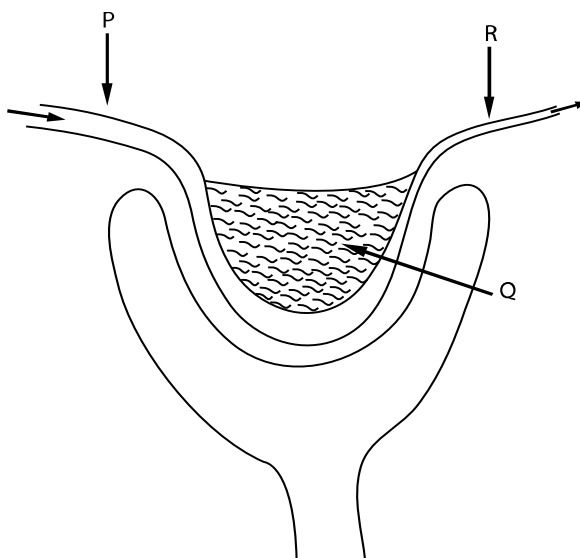
- b) What effect would reduced oxygen supply have on the uptake of sulphate ions?  
Explain your answer.

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18. The diagram below shows a part of a nephron.



- a) State TWO differences in composition of blood in parts P and R. (2 marks)

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- b) State a characteristic feature of blood capillaries in part Q that is not found in other capillaries (1 mark)

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19. (a) Name two types of light sensitive cells found in the human eye. (1 mark)

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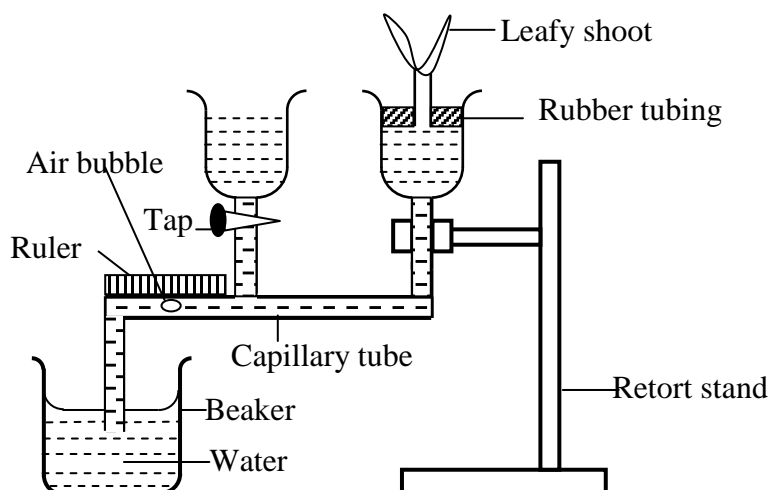
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- (b) State ONE functional difference between the cells you have named in a) above. (1 mark)

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20. A set up was used to investigate a certain process in plants as shown in the diagram below.



(a) What process was being investigated? (1 mark)

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(b) Giving a reason, state one precaution that should be taken when setting up this experiment.

(1 mark)

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(c) How would changes in temperature affect the rate of movement of the air bubble? (1 mark)

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21. Julie observed eight onion epidermal cells across the field of view of a light microscope. If the field of view was 4mm in diameter, estimate the average size of the cells in micrometers (1mm= 1000 $\mu$ m). (2 marks)

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22. How is support brought about in herbaceous plants? (2 marks)

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23. State the functions of the following parts of the mammalian ear.

a) Eustachian tube

(1mark)

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b) The utricle and sacculus

(1mark)

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24. In an experiment, a shoot of maize seedling was exposed to light on one side. It was observed that it grew bending towards the direction of the source of light.

a) Explain how the bending towards light occurs.

(2marks)

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b) State the survival value of the response named in a) above.

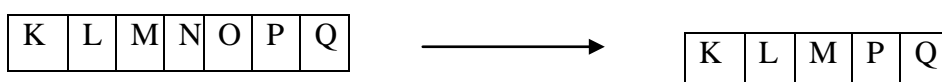
(1 mark)

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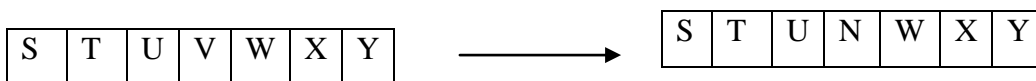
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25. The diagram below show various types of gene mutations.

Mutation I;



Mutation II;



i) Identify the type of mutations shown above

(2 marks)

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ii) Name one disorder that results from gene mutation II.

(1 mark)

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26. State THREE adaptations of a leaf to gaseous exchange.

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27. Distinguish between analogous structures and homologous structures. For each structure give an example. (4 marks)

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28. The diagram below shows a bone that was obtained from a mammal.



a) Identify the bone. (1 mark)

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b) i) Name the type of joint formed at the part marked P. (1 mark)

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ii) State one characteristic of the joint named in b) i) above. (1 mark)

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29. What is the importance of the pollen tube in fertilization in plants? (1 marks)

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30. a) The action of pepsin stops in the duodenum. Explain.

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b) State two functions of the muscles found in the alimentary canal of mammals. (2 marks)

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