**KOIMBI BOYS SECONDARY SCHOOL**

**END-TERM 2 EXAMS 2019**

**FORM 4 BIOLOGY**

**NAME……………………………………………… ADM.NO…………CLASS……..**

**231/2**

**BIOLOGY**

**PAPER 2**

**FORM 4**

**2 HOURS**

**INSTRUCTION TO CANDIDATES**

1. This paper has **two** sections; **A** and **B**.

2. Answer **all** the questions in section **A** in the spaces provided on the question paper.

3. From section **B**, answer questions **6** (**Compulsory**) and any other question in the spaces provided after question 8.

1. a).Name the sex chromosome in human that is considered to be genetically empty (1mk)

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…………………………………………………………………………………………………………………………………………………………..b) Colour blindness is a human disease inherited through a recessive gene carried on the X chromosome. If the carrier female married a normal male .Work out expected genotypes of their children. Show all your working (let **n** stand for colour blindness) (3mks)

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c) Work out the genotype ratio of the offsprings (1mk)

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d). Work out the probability of the first child being a carrier female (1mk)

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1. a) which branch of biology did the microscope give rise to? (1mk)

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b(i)What is an organelle? (1mk)

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(ii) What is the role of the nucleus in a cell (1mk)

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(iii) Name the chemical material in the nucleus which enableit to perform its function (1mk)

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c). Explain briefly why red blood cells have a short life span in a human being (1mk)

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d(i). Explain what happens inside the nucleus in interphase of mitosis (1mk)

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 (ii). Give one difference between a nucleus of a somatic cell and a gamete cell (2mks)

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1. a(i)What is meant by the term biological control (1mk)

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(ii)Give an example of biological control (1mk)

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b.(i) What is eutrophication? (3mks)

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 (ii) What are the effects of eutrophication? (3mks)

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1. The chart below shows blood clotting mechanism
2. Name the
3. Blood cells represented by B (1mks)

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1. Blood protein represented by C (1mk)

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1. Metal ions represented for blood clotting (1mk)

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1. Which vitamin is required for blood clotting (1mk)

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1. State the conditions under which blood transfusion may be necessary (2mks)

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1. State two factors to be considered before blood transfusion (2mks)

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1. An experiment was set up to investigate a certain process as shown in the diagram below



The set – up was left in bright sunlight for 4hrs

1. State the aim of the experiment (1mk)

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1. Name M and N (2mks)

M……………………………………………………………………………………………………………………………………………

N…………………………………………………………………………………………………………………………………………….

1. Other than sunlight name three factors that would affect the experiment(3mks)

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1. State how the identify of M would be confirmed (1mk)

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1. Explain why only submerged water plant was used in this experiment (1mk)

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**SECTION B (40mks)**

1. An investigation was conducted to compare rate of water loss from twigs of two different species of plants Q and L.The twigs had equal leaf surfaces. Theresults of the investigation were recorded in the table below

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Time of the day | 6a.m | 8a.m | 10a.m | 12pm | 2pm  | 4pm | 6pm | 8pm  | 10pm | 12am |
| Water loss(gh-i species Q | 0 | 4 | 20 | 40 | 55 | 36 | 26 | 20 | 0 | 0 |
| Water loss(gh-1-I species L | 8 | 20 | 39 | 131 | 198 | 182 | 130 | 81 | 12 | 12 |

1. On the graph paper provided plot a graph of water loss gh-1 against time of the two plants.(7mks)
2. Name the apparatus which might have been used to investigate the value of water loss (1mk)

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1. State two precautions that were taken in setting up the experiment (2mks)

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1. Which of the plant species is likely to be adapted in and conditions? Give a reason (2mks)

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1. Use the graph to answer the following questions
2. At what time of the day was 60gh -1 of water lost by species L ? (1mk)

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1. What was the rate of water loss from plant species Q at 11.00am? (1mk)

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1. Account for the rate of water loss between 6.00am to 1.00pm by plant species L (4mks)

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1. Suggest how the stomata of species Q are structurally adapted to water loss (2mks)

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1. a).state five differences between aerobic and anaerobic respiration (5mks)

b.Discuss the application of anaerobic respiration in industry and at home (15mks)

1. a.what is meant by the term natural selection (2mks)

b. Describe how natural selection brings about the adaptations of a species to its environment(12mks)

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

d. Name four evidences to show that evolution has taken place (4mks)

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