NAME………………………………………………………….INDEX NO………………………

SCHOOL…………………………………………………….. DATE……………………………

SIGN…………………………….

231/2

BIOLOGY

PAPER 2

(THEORY)

JULY/AUGUST 2016

TIME: 2 HOURS

**NAKURU SUB COUNTY SECONDARY SCHOOLS TRIAL EXAMINATIONS - 2016**

***Kenya Certificate of Secondary Education***

**INSTRUCTIONS TO CANDIDATES**

* Write your name and index number in the spaces provided above
* Sign and write the date of examination in the spaces provided above
* This paper consists of **TWO** sections A and B.
* Answer **ALL** questions in section A in the spaces provided
* In section B answer **question 6(compulsory**) and either question 7 or 8in the spaces provided after question 8
* This paper consists of 8 printed pages
* Candidates should check the question paper to ascertain that all the pages are printed and that no questions are missing

**FOR EXAMINERS USE ONLY**

|  |  |  |  |
| --- | --- | --- | --- |
| Section | Question | Maximum score | Candidate score |
| A | 1  2  3  4  5 | 8  8  8  8  8 |  |
| B | 6  7  8 | 20  20  20 |  |
|  | **TOTAL** | **80** |  |

***SECTION A (40 MARKS)***

1. A pea plant with round seeds was crossed with a pea plant that had wrinkled seeds. The gene for round seeds is dominant over that of the wrinkled seeds.

Using letter **R** to represent the dominant gene. State

(a) The genotype of parents if plant with round seeds was heterozygous (2 marks)

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(b) The gametes produced by the round and wrinkled seed parents. (2 marks)

Round seed parent………………………………………………………………………………..

Wrinkled seed parent …………………………………………………………………………….

(c) The genotype and phenotype of **F1** generation. Show your working (3 marks)

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(d) What is a test cross (1mark)

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2. The diagram below illustrate the role played by red blood in the transportation of carbon (IV) oxide

Substance **F** + carbon (IV) oxide

Enzyme **G**

Weak carbonic acid

Hydrogen ions hydrogen carbonates ions

(a) Other than carbon(IV) oxide transportation in the red blood cells, name the other form of carbon(IV) oxide transportation in humans (1 mark)

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(b)(i) Name substance **F**………………………………………………………. .(1 mark)

(ii) Name the enzyme marked **G** and state its role in the reaction (2 marks)

**G**……………………………………………………………………………………………

Role …………………………………………………………………………………………

(c) Explain why transportation of carbon (IV) oxide in red blood cells is advantageous (2marks)

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(d) Explain the role of calcium in blood clotting (2 marks)

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3 (a)(i) Explain the changes that takes place in the pupil and iris of a human eye when a

person moves from a dark room to a room with bright light. (4 marks)

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(ii) What is the significance of the changes explained in (a) above (1 mark)

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b) How does the human eye obtain nutrients? (1 mark)

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(c) Explain why the images that form in the blind spot are not perceived (2 marks)

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4 An experiment was carried out to investigate the rate of reaction shown below.

Sucrose Fructose + glucose.

For the products fructose and glucose to be formed, it was found that substance **K** was to be added and the temperature maintained at 37oC. When another substance **L** was added, the reaction slowed down and eventually stopped.

(a) Suggest the identity of substance **K** and **L**  (2 marks)

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(b) Other than temperature, state three ways by which the rate of reaction would be increased

(3 marks)

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(c) Explain how substance **L** slowed down the reaction (3 marks)

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5. The diagram below shows an instrument used in the laboratory.



(a) Name the apparatus shown above

…………………………………………………………………………… .(1 mark)

(b) Label the parts Q , K and R (3 marks)

**Q**……………………………………………………

**K**……………………………………………………

**R** …………………………………………………..

(c) What are the functions of parts **P, N** and **S.**  (3 marks)

**P**……………………………………………………………………………………………………

**N**…………………………………………………………………………………………………..

**S**……………………………………………………………………………………………………..

(d) What is the formula of calculating linear magnification (1 mark)

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**SECTION B. (40 MARKS)**

***Answer question 6 (compulsory) and either question 7 or 8 in the spaces provided after question 8***

*6.* Tw*o* persons **X** and **Y** drunk volumes of concentrated solution of glucose. The amount of glucose in their blood was determined at intervals. The results are shown in the table below.

|  |  |  |
| --- | --- | --- |
| Time(minutes) | Glucose level in blood(mg//100cm3) | |
|  | X | Y |
| 0 | 87 | 84 |
| 15 | 112 | 123 |
| 30 | 139 | 170 |
| 45 | 116 | 188 |
| 60 | 100 | 208 |
| 90 | 95 | 202 |
| 120 | 92 | 144 |
| 150 | 88 | 123 |

(a) On the grid provided, plot graphs of glucose level in blood against time on the same axes

 (7 marks)

(b) What was the concentration of glucose in the blood of **X** and **Y** at the 20th minute? (2 marks)

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(c) Suggest why the glucose level in person **X** stopped rising after 30 minutes while it continued rising

in person **Y**? (3 marks)

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(d) Account for the decrease in glucose level in person **X** after 30 minutes and person **Y** after 60 minutes (3 marks)

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(e) Name the compound that stores energy released during oxidation of glucose (1 mark)

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f) Explain what happens to excess amino acids (4 marks)

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7. Describe how the human kidney functions (20 marks)

8. Explain how abiotic factors affect plants (20 marks)

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