NAME: …………………………………………………..…………… ADM. NO: ……….……………..

DATE……………..………………

CLASS ……………………………

231/2

BIOLOGY

PAPER 2 (THEORY)

OCT 2014

TIME: 1HR 45 MINS

SUNSHINE END YEAR EXAMINATION 2014

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

BIOLOGY

PAPER 2

INSTRUCTIONS

*Write your name, and Adm.number in the spaces provided above.*

*This paper consists of two sections; A and B.*

*Answer all the questions in Section A in the spaces provided.*

*In section B, answer question 6(compulsory) and either question 7 or 8 in the spaces provided after question 8.*

**For Examiner’s Use only:-**

|  |  |  |  |
| --- | --- | --- | --- |
| **SECTION** | **QUESTION** | **MAXIMUM SCORE** | **CANDIDATE’S SCORE** |
| A | 1234 | 8888 |   |
| B | 6 7 8 | 202020 |   |
| **TOTAL SCORE** | **80** |   |

 **SECTION A (32) MKS**

1. The graph **below** show the effect of temperature on an enzyme catalysed reaction.

•

•

•

X

B

C

A

D

Rate of

Reaction

Temperature

1. Account for the shape of the curve between.

(i) A and B. (3 marks)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………......

 (ii) C and D. (2 marks)

…………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

 (b) What does the point marked X represent? (1 mark)

……………………………………………………………………………………………………………………………………………………

(c)Apart from temperature, state **two** other factors that affect the rate of enzyme controlled reaction. (2 marks)

…………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

2. The figure below was used to demonstrate a certain physiological process in germinating Seeds.



(a)What observations would be made in the set-up at the end of the experiment? (2mks) ……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..

(b)i. Suggest what would happen in the set-up if the seeds were mixed with pyrogallic acid (1mk) …………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..

(ii) Explain your answer in b (i) above. (2mks) ………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

(c) What chemical change is taking place in the germinating peas? (2mks) ……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..

(d) Suggest a control experiment for this set-up.(1mk) …………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..

3. In an experiment to compare the basal metabolic rate of some animals, the amount of oxygen consumed per unit body weight in a given period of time was determined. The table below shows the results of the investigations.

|  |  |  |
| --- | --- | --- |
| Animal | Body weight(Kg) | Oxygen consumed (g/hr.) |
| Buffalo | 546 | 47 |
| Man | 58 | 203 |
| Rabbit | 3 | 318 |
| Rat | 0.1 | 700 |
| Mouse | 0.02 | 1510 |

(a) Comment on the volume of oxygen consumed by the buffalo and the mouse. (1mk) …………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..

 (b) Account for the above comparison for:

(i) Buffalo (2mks) ……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..

(ii) Mouse (2mks) ……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..

(c) What is Basal metabolic Rate (BMR)? (1mk) …………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..

(d) Explain how high temperature increases the rate of diffusion. (2mks) ……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..

4 (A) what is multiple allelism? (1mk) ……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

(b) A pure breeding black male mouse was mated with a pure breeding brown female mouse. All the offspring had black coat colour.

(i) Explain the appearance of black coat colour in the offspring. (1mk) …………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..

(ii) If the black parental mouse was mated with a mouse that is heterozygous for coat colour, work out the genotypic ratio of offspring. Show your working (5mks)

 (iii) State two disorders in human beings that are as a result of chromosomal mutations. (2mks)

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 **SECTION B (40MKS)**

Answer question 6**(COMPULSORY)** in the spaces provided. Answer either question 7 or 8 in the spaces provided after question 8.

6. An investigation was conducted to compare water loss from twigs of two species of plants Q and L. The apparatus shown below was used for this investigation. The twigs had equal leaf surface.



The results of the investigation were recorded in the table below.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Time of the day | 6am | 8am | 10am | 12noon | 1pm | 2pm | 3pm | 4pm | 6pm | 8pm | 12 midnight |
| Water loss gh-1 species Q | O | 4 | 20 | 40 | 55 | 36 | 26 | 20 | 2 | O | O |
| Water loss gh-1 species L | 8 | 20 | 39 | 131 | 198 | 182 | 130 | 81 | 45 | 12 | 12 |

(a) Plot a graph of water loss gh-1 against time for the two plants. (7mks)

(b) Name the apparatus used in the above investigation (1mk)

………………………………………………………………………………………………………………………………………………………………….

(c)State TWO precautions that were taken in setting up this experiment.(2mk) ……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..

(d) Which of the plant species is likely to be adapted to arid conditions? Give reason. (2mks) ……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..

(e) Use the graph to answer the questions that follow:

(i) At what time of the day was 60gh-1 of water lost by plant species? (1mk) ………………………………………………………………………………………………………………………………………………………………….

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

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

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

7. a) State **five** differences between aerobic and anaerobic respiration. (5mrks)

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

 8 a) Define the term secondary thickening (2marks)

 b Briefly describe how secondary thickening occurs in woody plants (14marks)

 c) i) State **two** ways in which growth in plants is different from that in animals (2marks)

 ii) State how ecdysis affects the *growth o*f insects (2marks