**NAME........................................................................................................CLASS..........................INDEX NO..........................................ADM NO……………DATE....................SIGN...............**

**231/2**

**BIOLOGY**

**PAPER 2**

**JULY 2018**

**TIME: 2 HOURS**

**MOKASA II EXAMINATIONS**

**Biology**

**Paper 2**

**INSTRUCTIONS TO CANDIDATES:**

* *Write* ***your name*** *and* ***index number*** *in the spaces provided.*
* *Answer* ***all*** *the questions in Section* ***A*** *in the spaces provided.*
* *In section* ***B*** *answer questions* ***6*** *(compulsory) and either question* ***7*** *or* ***8*** *in the spaces provided*

***For Examiner’s Use Only:***

|  |  |  |  |
| --- | --- | --- | --- |
| **SECTION**  | **QUESTIONS** | **MAXIMUM SCORE** | **CANDIDATES SCORE** |
| A  | 1 | 8 |  |
| 2 | 8 |  |
| 3 | 8 |  |
| 4 | 8 |  |
| 5 | 8 |  |
| **B**  | 6 | 20 |  |
| 7 | 20 |  |
| 8 | 20 |  |
| **TOTAL** | **80** |  |

*This paper consists of 10 printed pages. Candidates should check to ascertain that all papers are printed as indicated and that no questions are missing*

1. In humans, premature baldness is a sex linked gene on the Y chromosome.

(a) Letter YB represent the chromosome carrying the gene for premature baldness, using a punnet square work out a cross between a man with premature baldness and his wife. (4 marks)

(b)(i) What is the probability of the girls having the trait in (a) above? (1 mark)

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

(ii) Give a reason for your answer in (b) (i) above. (1 mark)

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

(c) Give the significance of the following genetically modified organisms:

(i) Genetically modified maize. (1 mark) ………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

(ii) Genetically modified *Escherichia coli*. (1 mark)

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

2. Diagram below shows a stem of a plant growing round a tree trunk.

****

(a) What is the name of the response which causes such a twisted growth? (1 mark

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

(b) Name the stimulus involved in the process. (1 mark)

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

(c) Explain how the process is occurs. (4 marks)

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

(d) State the significance of the process above. (2 marks)

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

3. The diagram below illustrates an experiment to determine the rate of a certain process in a small insect.



(a) State the changes observed after the experiment has run for five minutes. (1 mark)

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

(b) Account for the changes observed in (a) above. (4 marks)

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

(c) Why is it necessary to place the flask in a water bath? (1 mark)

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

(d) Name the organelle involved in the process under investigation and the significance of this process. (2 marks)

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

4. Examine the drawings of the various organisms and the dichotomous key shown below.



1. a Jointed legs present…………………...………….…….…………..……….…Go to 2

 b Jointed legs absent………………….………………………….…..……..…...Go to 6

2. a Three pairs of legs………………………………...……………..……………Go to 3

 b More than three pairs of legs………………………...………….....……..…..Go to 5

3. a Wings present…………………………………………...……….………....…Go to 4

 b Wings absent…………………………………………….……….……….…..Bedbug

4. a Two pairs of wings……………………………………………….…………Dragonfly

 b One pair of wings............................................................................................Housefly

5. a Antennae present…………………………………………………………...…Crayfish

 b Antennae absent……………….……………………………………………...…...Mite

6. a Shell present………………………………………………………………………Snail

 b Shell absent……………………………………………………………………..go to 7

7. a Prominent clitellum visible…………………………………………...….…Earthworm

 b No clitellum visible…………………..…………………………………….……..Leech

Fill in the steps necessary for identification of the organisms.

|  |  |  |  |
| --- | --- | --- | --- |
| Organism  | Steps  | Identity  | Marks |
| A |  |  | 1 mark |
| B |  |  | 1 mark |
| C |  |  | 1 mark |
| D |  |  | 1 mark |
| E |  |  | 1 mark |
| F |  |  | 1 mark |
| G |  |  | 1 mark |
| H |  |  | 1 mark |

5.The diagram below shows part of a longitudinal section of a young root.



(a) Describe how the structure labeled A is structurally modified to perform its function. (4 marks)

............................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................

(b) Explain how water molecules enter the structure labeled A. (2 marks)

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

(c) State two forces that maintain a continuous column of water in the structure D. (2 marks)

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

**SECTION B: 40 (MARKS)**

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

6. The graph below shows the effect of temperature on the rate of enzyme reaction

.



(a) Account for rate of reaction between:

(i) A to B. (3 marks)

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

(ii) B to C. (4 marks)

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

(iii) C to D. (3 marks)

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

(iv) D to E. (4 marks)

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

(v) Explain what would happen to a population of yeast cells exposed to boiling water with temperatures beyond 400C. (3 marks)

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

(vi) Explain the following observations

(a) Digestion of starch stops in the stomach. (1 mark)

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

(b) Mercury stops enzyme reaction. (1 mark)

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

(c) Pepsin is produced in its inactive form. (1 mark)

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

7. (a) Explain how a person restores an upright posture when falling down . (8 marks)

(b) Discuss the factors necessary for germination of seeds. (12 marks)

8. (a) Describe the mechanism of gaseous exchange in a bony fish. (12 marks)

(b) Describe the photosynthetic theory of opening and closing the stomata. (8 marks)

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

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