Name: …………………………………………………………… Index no ……..…...................................

School: ……………………………………………………....…. Candidate’s sign ……………………....

Date: ……………………………………………………………

**231/2**

**BIOLOGY**

**PAPER 2**

**JUNE 2016**

**TIME: 2 HOURS**

**KASSU JET EXAMINATION**

***Kenya Certificate of Secondary Education (K.C.S.E.) 2016***

**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*

**SECTION A ( 40 MARKS)**

***Answer all the questions in this section in the spaces provided***

1. A couple has three children, the mother had **blood group A** and the father had **blood group B** while one of the children had **blood group 0.**

(a) (i) **What** were the genotypes of the parents? (1mark)
 Father

…………………………………………………………………………………………………………
Mother

…………………………………………………………………………………………………………
(ii) What was the genotype of the child with blood **group 0?** (1mark)

…………………………………………………………………………………………………………
(b) **Work out** using a **punnet** square the genotypes of the other children. (4 marks)

(c) **Which** child can receive blood from any member of the family? (1mark)

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

(d) **State** the percentage of children who can donate blood to all blood groups. (1mark)

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

1. Below is a diagram of a structure found in Eukaryotic cells? Study it and answer the questions that follow

. 

 a**) Identify** the structure (1 mark)

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

 b) State **two** functions of the structure (2 marks)

 i. …………………………………………………………………………………………………………

 ii.

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

 c) (i) Name **one** organelle found in animal cells but absent in plant cells (1 mark)

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

 ii) State **one** function of the organelle you have named in(c) above (1 mark)

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

 d) Briefly **explain** cell biology as an evidence of evolution (3 marks)

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

1. Below is a diagram of a plant a form three student collected while carrying out an ecological study?



*Adventitious root*

1. With reasons identify the division into which the students classified the plant.

Division (1mark)

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

Reasons (2marks)

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

b) (i) **Name** the structure that produces spores in this plant. (1mark)

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

1. State **two** differences between the plant division above and that of the division *spermatophyta.* ( 2 marks)

|  |  |
| --- | --- |
|  | *Spermatophyte* |
|  |  |
|  |  |

c) Give **two** distinguishing features of class *Amphibia* (2marks)

a) ………………………………………………………………………………………………

b) ………………………………………………………………………………………………

1. The diagram below represents human foetus in a uterus.

**Placenta**

 

 **Chorion**

**C**

**D**

**B**

**Mucus plug**

1. **Name** the part labeled D. (1 mark)

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

1. i) **Name** the types of blood vessels found in the structure labeled C. (2 marks)

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

 ii)  **State** the differences in composition of blood found in the vessels named in (b) (i) above. (2 marks)

|  |  |
| --- | --- |
|  |  |
|  |  |
|  |  |

iii) State **two** importance of the fluid found in part B (2 marks)

 ………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..iv) **State** the role of progesterone during pregnancy (1 mark)

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

1. The diagram below represents three types of neurons found in a mammalian body.

**W**

**M**

 **Y**

**Z**

**X**

(a) Name the neurons **X, Y** and **Z** (3marks)

X………………………………………………………………………………………………………..

Y……………………………………………………………………………………………………….

Z………………………………………………………………………………………………………

 (b) Name the chemical substance responsible for the transmission of an impulse across the gap

 labelled **W**. (1mark)

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

(c) State **two** functions of the part labelled **M**. (2marks)

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

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

 (d) In which part of the spinal cord is neurone **Y** located? (1mark)

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

(e) Using arrows indicate on the diagrams the direction followed by nerve impulse leading to a

 response. (1mark)

***SECTION B (40MARKS)***

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

1. During germination and growth of a cereal, the dry weight of endosperm, the embryo and total dry weight were determined at two – day intervals. The results are shown in the table below.

|  |  |  |  |
| --- | --- | --- | --- |
| Time after planting(days) | Dry weight of endosperm | Dry weight of embryo (mg ) | Total dry weight (mg) |
| 0 | 43 | 2 | 45 |
| 2 | 40 | 2 | 42 |
| 4 | 33 | 7 | 40 |
| 6 | 20 | 17 | 37 |
| 8 | 10 | 25 | 35 |
| 10 | 6 | 33 | 39 |

a) Using the same axes, draw graphs of dry weigh of endosperm, embryo and the total dry weight against time (8marks)

b**) What** was the dry weight of the endosperm and embryo on the **5th day?**  (2marks)

Endosperm

……………………………………………………………………………………………………....….Embryo

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

c) **Account** for:

 i) Decrease in dry weight of endosperm from day 0 to 10 (2marks)

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

 ii) Increase in dry weight of embryo from day 0 day 10 (2marks) ………………………………………………………………………………………………………… ………………………………………………………………………………………………………… …………………………………………………………………………………………………………

 iii) Decrease in total dry weight from day 0 to day 8 (2marks) ………………………………………………………………………………………………………… ………………………………………………………………………………………………………… …………………………………………………………………………………………………………

d) **State** the role of the following in germination (2marks)

 i) Glucose

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

 ii) Enzymes

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

e) **How** are the foliage leaves adapted to their function (2 marks) ………………………………………………………………………………………………………… ………………………………………………………………………………………………………… …………………………………………………………………………………………………………

7 (a) **Describ**e the role of hormones in blood sugar regulation (10 marks)

 (b) **Explain** how halophytes are adapted to their habitat (10 marks)

8 (a**) Explain** the adaptations of thoracic, cervical and lumbar vertebrae to their functions (12 marks)

 (b) **Describe** the structural factors affecting transpiration (8 marks)

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