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

**SCHOOL…………………………………..CLASS................................. SIGN…………....................….**

**BIOLOGY**

**231/2**

**PAPER 2**

**TIME: 2 HOURS**

**AUGUST-2022**

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**CEKENAS END OF TERM TWO EXAM-2022**

**FORM FOUR EXAM**

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

***BIOLOGY PAPER 2***

***231/2***

**INSTRUCTIONS TO CANDIDATES**

1. Write your name and index number in the spaces provided above
2. Sign and write date of examination in the space provided.
3. All working must be clearly shown where necessary.
4. Mathematical tables and silent electronic calculations may be used
5. Answer all questions in English.

**For examiners use only**

|  |  |  |
| --- | --- | --- |
| **QUESTION** | **MAXIMUM SCORE** | **CANDIDATE’S SCORE** |
| **1** | **8** |  |
| **2** | **8** |  |
| **3** | **8** |  |
| **4** | **8** |  |
| **5** | **8** |  |
| **6** | **20** |  |
| **7** | **20** |  |
| **8** | **20** |  |
| **TOTAL**  | **80** |  |

**SECTION A (40 MARKS)**

1. The diagram below represents two plant cells A and B placed in two different solutions. Study the diagrams and answer the questions that follow:

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a) Identify the nature of solution into which each cell was placed. (2mks)

A……………………………………………………………………………………………………………...

B………………………………………………………………………………………………………………...

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b) Name the physiological process responsible for the observed results. (1mk)

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c) Give the correct biological term used to describe cell A. (1mk)

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d) Describe what happen if red blood cell was placed in the solution in which cell B was placed. (2mks)

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e) Explain why freshwater amoeba do not burst when placed in distilled water. (2mks)

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2. i) Under certain conditions, carbon (IV) oxide concentration in the blood of mammals rises above the normal levels. State two physiological change that occur to bring carbon (IV) oxide level back to normal.

 (2mks)

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ii) Why does a fresh wound bleed more in a hot weather than in cold weather? (2mks)

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iii) A certain organ R was surgically removed from a rat. Later a drastic increase in glucose level was observed in blood. Substance S was injected into the animal’s blood. The whole process was reversed. Identify:

Organ R……………………………………………………………………………………………… (1mk)

Substance S………………………………………………………………………………………… (1mk)

iv) State two functions of blood plasma. (2mks)

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3. a) Explain why people with sickle-cell trait have an advantage of surviving malarial attack than those with normal red blood cells. (2mks)

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b) Colour blindness is a sex linked trait caused by a recessive gene carried on the X chromosome. A carrier woman marries a man with normal colour vision. Using letter N to represent the gene for normal colour vision, workout the probability of the couple getting a colour blind son. (5mks)

c) State one advantage of polyploidy in plants. (1mk)

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4. The diagram below represents a living organism.

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a) Name the division to which the organism belongs to. (1mk)

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b) Name part labelled Q. (1mk)

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c) State two functions of part T. (2mks)

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d) During a practical activity, Form three students of Bora Boys collected a specimen whose drawing is as shown below. State the class that the organism belongs to giving a reason.

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Class ……………………………………………………………………………………………………(1mk)

Reason ………………………………………………………………………………………………... (1mk)

e) State the economic importance of a named fungus. (2mks)

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5.a) Distinguish between population and community. (2mks)

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b) What is the importance of the following in an ecosystem? (2mks)

Decomposers

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Predation

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c) Give a reason why two species in an ecosystem cannot occupy the same niche. (2mks)

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d. i) Name the bacteria found in root nodules of leguminous plants. (1mk)

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ii) Identify the relationship between the bacteria named in d(i) above. (1mk)

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**SECTION B (40MARKS)**

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

6. The table below shows how quantities of sweat and urine produced by a healthy adult human vary with external temperature.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| External Temperature  | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 |
| Urine produced cm3/hr. | 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 |
| Sweat produced in cm3/ hr. | 5 | 6 | 10 | 15 | 30 | 60 | 120 | 200 |

a) Using the same axes, draw graphs of quantities of urine and sweat against external temperature. (8mks)



b) Account for the amount of sweat produced as the external temperature rises. (3mks)

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c) At what temperature was the amount of urine equal to amount of sweat produced. (1mk)

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d) Explain the effects of temperature on the amount of urine produced. (4mks)

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e) Explain how the following structures reduce body heat loss when external temperatures are low.

i) Skin hairs (2mks)

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ii) Blood vessels (2mks)

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7.a) Describe the adaptations of mammalian male reproductive system to its function. (10mks)

b) Explain how the vertebrae below are adapted to their functions. (10mks)

i) Cervical vertebrae

ii) Thoracic vertebrae

8. Explain how the leaves of mesophytes are suited to their functions. (20mks)

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