**Name………………………………………………Index No. …………………….**

**School ………………………………………………...Sign…………………………….**

231/2

**BIOLOGY**

PAPER 2 (THEORY)

NOV/DEC.2021

**Time: 2 HOURS**

***@west Practice papers-2021***

**BIOLOGY 2021.**

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

231/2

**BIOLOGY PAPER 2 (THEORY)**

2HRS

NOV/DEC.2021

**INSTRUCTIONS TO CANDIDATES**

* Write your name, index number and the name of the school in the space provided.
* This paper consists of 2 sections **A**, and **B**
* Answer **ALL** the questions in section **A**.
* In section **B**, answer question **6 (Compulsory)** and either question **7** or **8** in the spaces provided after question **8**.

**FOR EXAMINERS USE ONLY**

|  |  |  |  |
| --- | --- | --- | --- |
| **Section** | **Questions** | **Maximum Score** | **Candidates Score** |
| **A** | **1****2****3****4****5** | **8****8****8****8****8** |  |
| **B** | **6****7****8** | **20****20****20** |  |
| **TOTAL SCORE** | **80** |  |

*This paper consists of 10 printed pages*

*Candidates should check the question paper to ensure that all pages are printed as indicated*

*and no questions are missing*

 **SECTION A.**

1. (a) Viable seed may not germinate even when provided with favorable condition. State the importance of the above phenomena. (2mks)

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(b) Monocotyledonous plants do not undergo secondary growth. Explain. (2mks)

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(c) In the diagram below, a bean seedling was pinned in a horizontal position inside a clinostat.

 

1. Explain what you would expect to observe after 48 hours if the clinostat was not rotating. (2mks)

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1. Explain what you would expect to observe after 48 hours if the clinostat was rotating slowly. (2mks)

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1. (i) Explain the concept of the negative feedback mechanism. (3mks)

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1. Study the diagram below and answer the question that follows.



 On the organ above, draw a small circle and label it **X** to show where the adrenal gland is located. (1mk)

1. Explain the effect of the hormone secreted by the adrenal gland in blood sugar regulation. (2mks)

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1. Name two diseases that affect organ labeled A. (2mks)

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1. The pedigree diagram below show part of a family tree in which the inherited condition of phenylketonuria occurs.



 (a) Identify and explain one piece of evidence from this family tree to show that the allele for phenylketonuria is a recessive to allele for the normal condition. (2mks)

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(b) If individual 10 married a man who is the heterozygous for the gene, what is the probability that their first child will be affected? (2mks)

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(c) A garden pea plant was crossed with a dwarf garden pea plant and all the offspring’s were tall. Using later T to represent the gene for tallness, determine the genotype of the F2 if the F1 were test crossed. (4mks)

1. (i) Distinguish between dentition and dental formula. (2mks)

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1. The diagram below represents the lower jaw of a mammal.



1. Name the mode of nutrition of mammal whose jaw is shown. (1mk)

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1. State one structural and one functional difference between the teeth labeled R and T. (2mks)

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1. ((i) Name the tooth labelled S. (1mk)

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 (ii) State how the tooth named in C (i) above is adapted to its function. (2mks)

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1. The figure bellow is a cross-section of retinol cells of a mammalian eye.



 (a) Identify the retinol cells labeled P and R. (2mk)

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 (b) Label each of the parts marked A, B, C and D. (2mks)

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 (c) Based on the diagram, explain why it takes long for the eye to adjust when one move from a

 Lit room to a dark room. (3mks)

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 (d)State structural difference between cell P and cell R. (1mk)

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 **SECTION B.**

1. The pressure in the flow of blood in a mammal was determined at two different vessels; X and Y. The data was taken within a period of 1 minute and was presented as follows.

|  |  |  |
| --- | --- | --- |
| Time in seconds |  Blood pressure in  |  |
| Vessel X | Vessel Y |
| 0 | 160 | 320 |
| 10 | 165 | 360 |
| 20 | 170 | 320 |
| 30 | 180 | 400 |
| 40 | 170 | 360 |
| 50 | 160 | 320 |
| 60 | 160 | 360 |

 (a) Plot the graph of blood pressure in both vessels against time in the same axis. (7mks)

 (b) Describe the trend of each curve. (2mks)

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 (c) From the graph, suggest the possible identity for:

 (i) Blood vessel X. (1mk)

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 (ii) Blood vessel Y. (1mk)

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 (d) Give reason for your answer in (c) (i) and (ii) above. (2mks)

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1. State two structural differences between the two vessels mentioned in C above. (2mks)

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1. Name two diseases of the circulatory system in humans. (2mks)

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1. Other than, transport of substances state one other function of blood. (1mk)

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1. (a) Discuss the economic importance of bacteria. (10mks)

 (b) Discuss the adaptation of *Schistosoma mansoni* to its survival. (10mks)

1. (a) Describe the photosynthetic theory. (10mks)

(b) Describe gaseous exchange in terrestrial plant. (10mks)

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