

Name.....Index No.

SchoolSign.....

231/2

BIOLOGY
PAPER 2 (THEORY)
NOV/DEC.2021
Time: 2 HOURS

WESTLANDS SUBCOUNTY JOINT EXAMINATIONS

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 | 8 | |
| | 2 | 8 | |
| | 3 | 8 | |
| | 4 | 8 | |
| | 5 | 8 | |
| B | 6 | 20 | |
| | 7 | 20 | |
| | 8 | 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*

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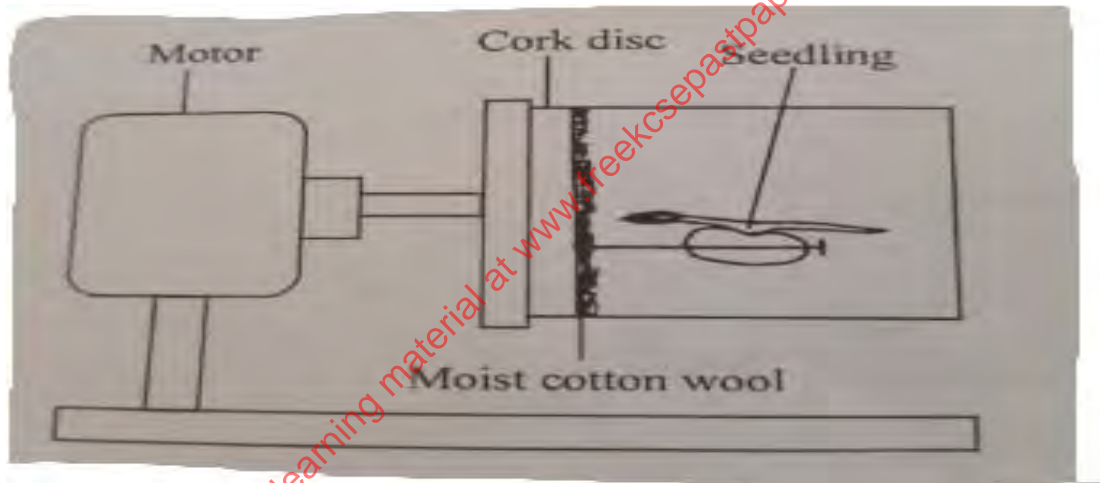
- (b) Monocotyledonous plants do not undergo secondary growth. Explain. (2mks)

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



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

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

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

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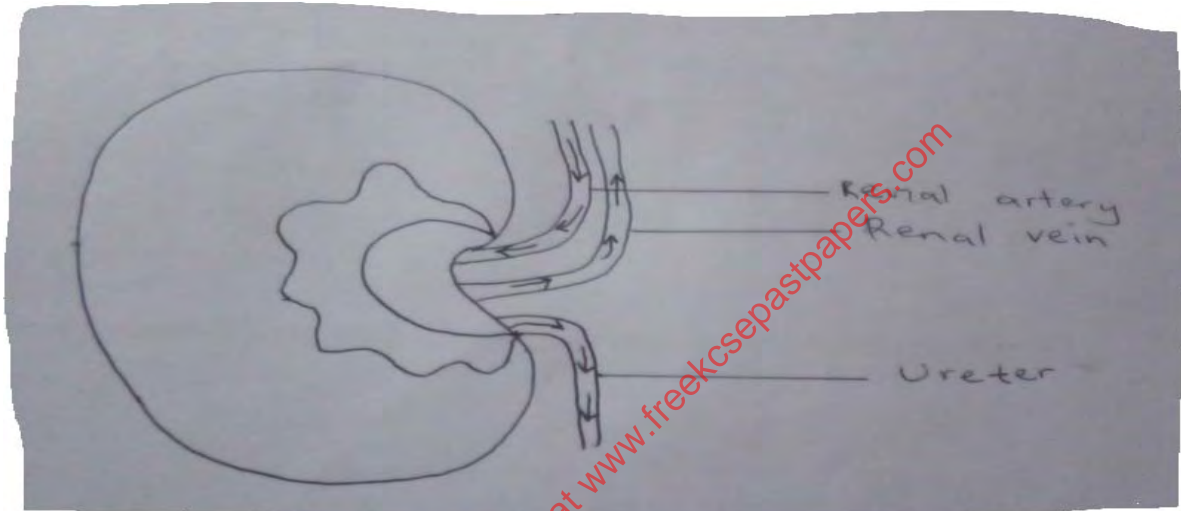
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(ii) Study the diagram below and answer the question that follows.



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

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

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

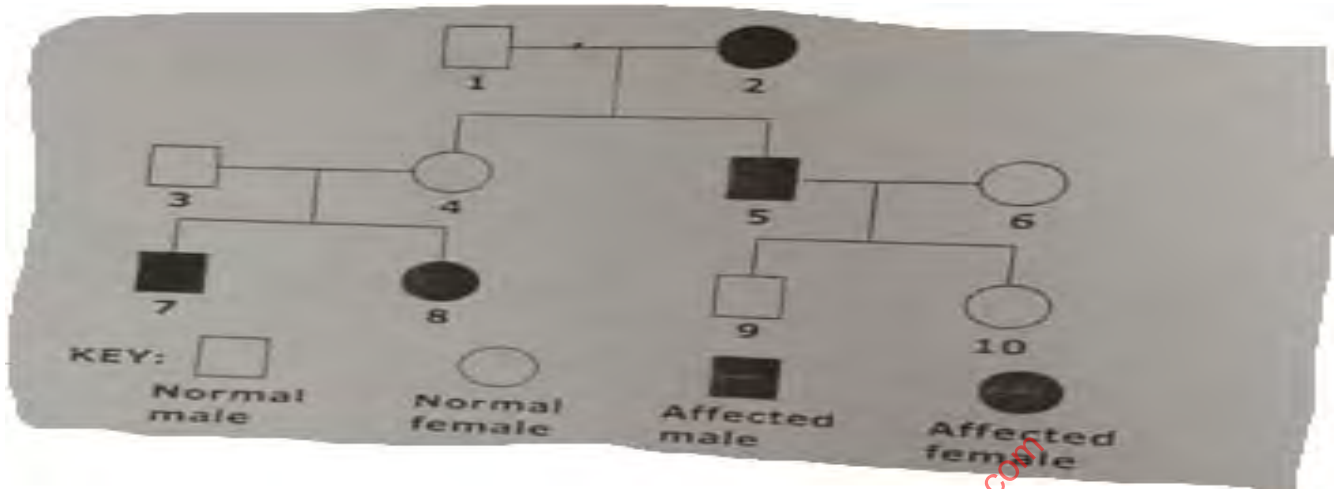
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3. The pedigree diagram below show part of a family tree in which the inherited condition of phenylketonuria occurs.



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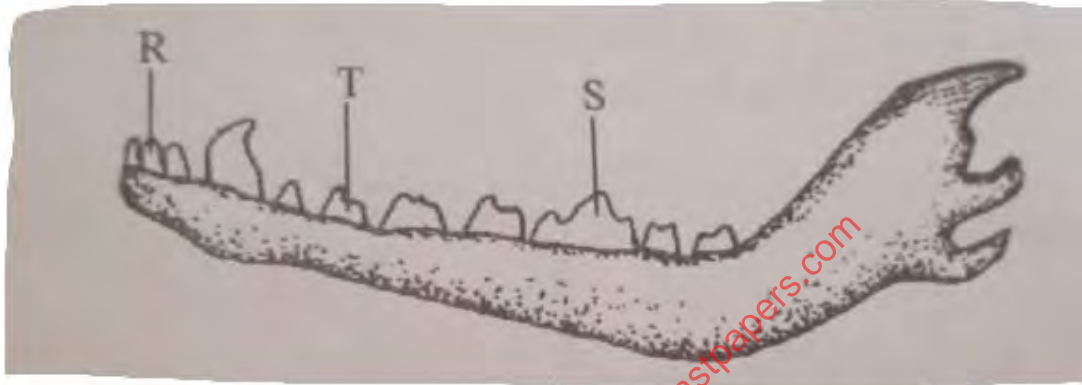
(c) A garden pea plant was crossed with a dwarf garden pea plant and all the offspring's were tall. Using later T to represent the gene for tallness, determine the genotype of the F₂ if the F₁ were test crossed.

(4mks)

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

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(iii) The diagram below represents the lower jaw of a mammal.



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

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

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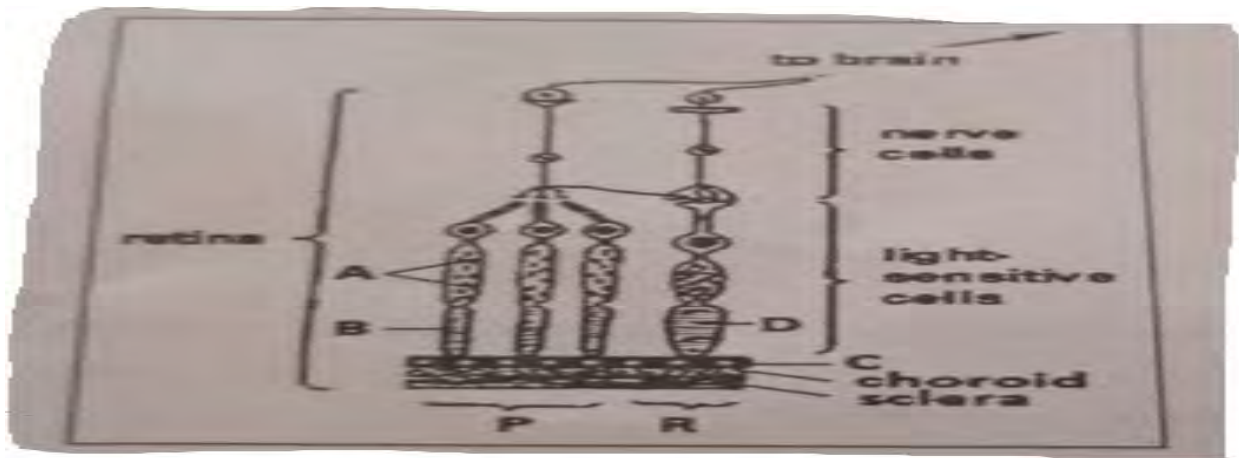
(c) (i) Name the tooth labelled S. (1mk)

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

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5. 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.

6. 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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- (e) Explain a factor that would result in to an increase in blood pressure in both the blood vessels above. (2mks)

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

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