



MARANDA HIGH SCHOOL

Kenya Certificate of Secondary Education

PRE-MOCK EXAMINATIONS 2023

CODE: 231/2

BIOLOGY – FORM 4 Paper 2

APRIL 2023 – TIME: 2 Hours

Name: Adm No:

Class:

Date: /04/2023

INSTRUCTIONS TO CANDIDATES

- Answer **all** the questions in section **A**.
- In section **B**, answer question 6 and either question **7 OR 8**.
- Answers **must** be written in the spaces provided in the question paper.
- Additional pages **must not** be inserted.
- Candidates may be penalized for recording irrelevant information and for incorrect spellings.

FOR EXAMINER'S USE ONLY

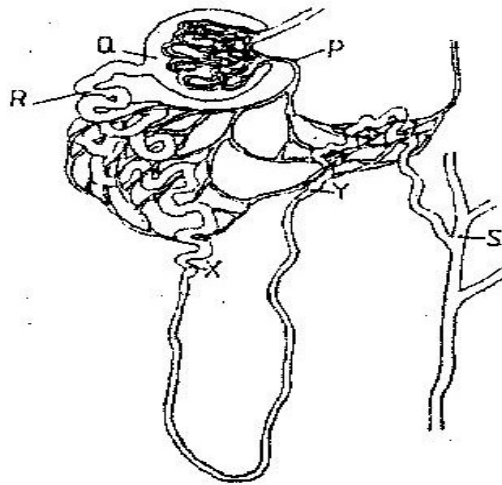
Questions	Maximum Score	Candidate's Score
1	8 MKS	
2	8 MKS	
3	8 MKS	
4	8 MKS	
5	8 MKS	
6	20 MKS	
7 OR 8	20 MKS	
TOTAL	80 MKS	

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Biology Paper 2

(THEORY)

1 The diagram below represents a mammalian nephron



(a) Name the

(i) Structure label P..... (1mk)

(ii) Portion of the nephron between point X and Y..... (1mk)

(b) Name the process that takes place at point Q..... (1mk)

(c) Name **one** substance present at point R but absent at point S in a healthy mammal. (1mk)

.....

(d) The appearance of the substance you have mentioned in (c) above is a symptom of a certain disease caused by a hormone deficiency. Name the

(i) Disease..... (1mk)

(ii) Hormone..... (1mk)

(e) State the structural modifications of nephrons found in the desert mammal. (2mks)

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2 a) What is organic evolution? (2mks)

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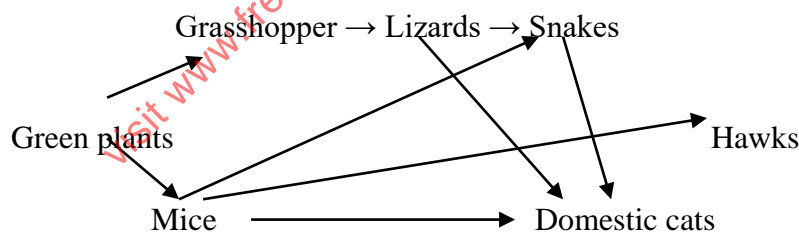
b) State **two** ways in which Homo sapiens differ from homo habilis. (2mks)

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c) Distinguish between divergent and convergent evolution giving examples in each case. (4mks)

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3 The chart below shows a feeding relationship in a certain ecosystem



(a) Construct **two** food chains ending with a tertiary consumer in each case. (2 mks)

(b) Which organism has the largest variety of predators in the food web? (1 mk)

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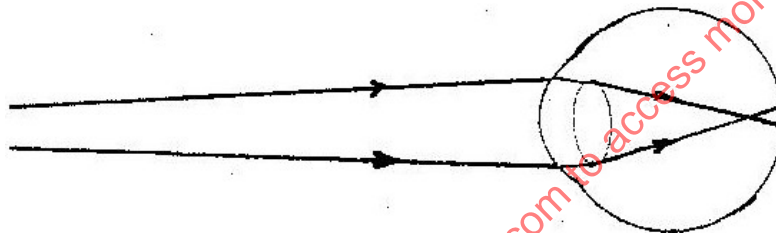
(c) Name **two** secondary consumers in food web. (2 mks)

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(d) Suggest **three** ways in which the ecosystem would be affected in there was a prolonged drought. (3mks)

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4 The diagram below shows the position of an image formed in a defective eye.



a) Name the defect: (1mk)

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b) Explain how the defect named in (a) above can be corrected (2mks)

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.....

c) Apart from hearing, state another function of the human ear. (1mk)

.....

d) State **two** functional differences between the rods and cones in the human eye. (2mks)
State the function of the following structures:

i) Eustachian tube. (1mk)

.....
.....

ii) Ear ossicles. (1mk)

.....

5 Red-green colour blindness is inability to distinguish red and green colours.

It's caused by sex- linked recessive gene.

a)i)In which chromosome is this gene found. (1mk)

.....

ii)Which part of the eye fails to develop? (1mk)

.....

b) A colour blind man marries a homozygous normal woman. Show the genotypes of the resulting offsprings. (Use R to stand for a dominant gene.) (4mks)

c)Why is it that the colourblind man cannot transmit this trait to his sons? (2mks)

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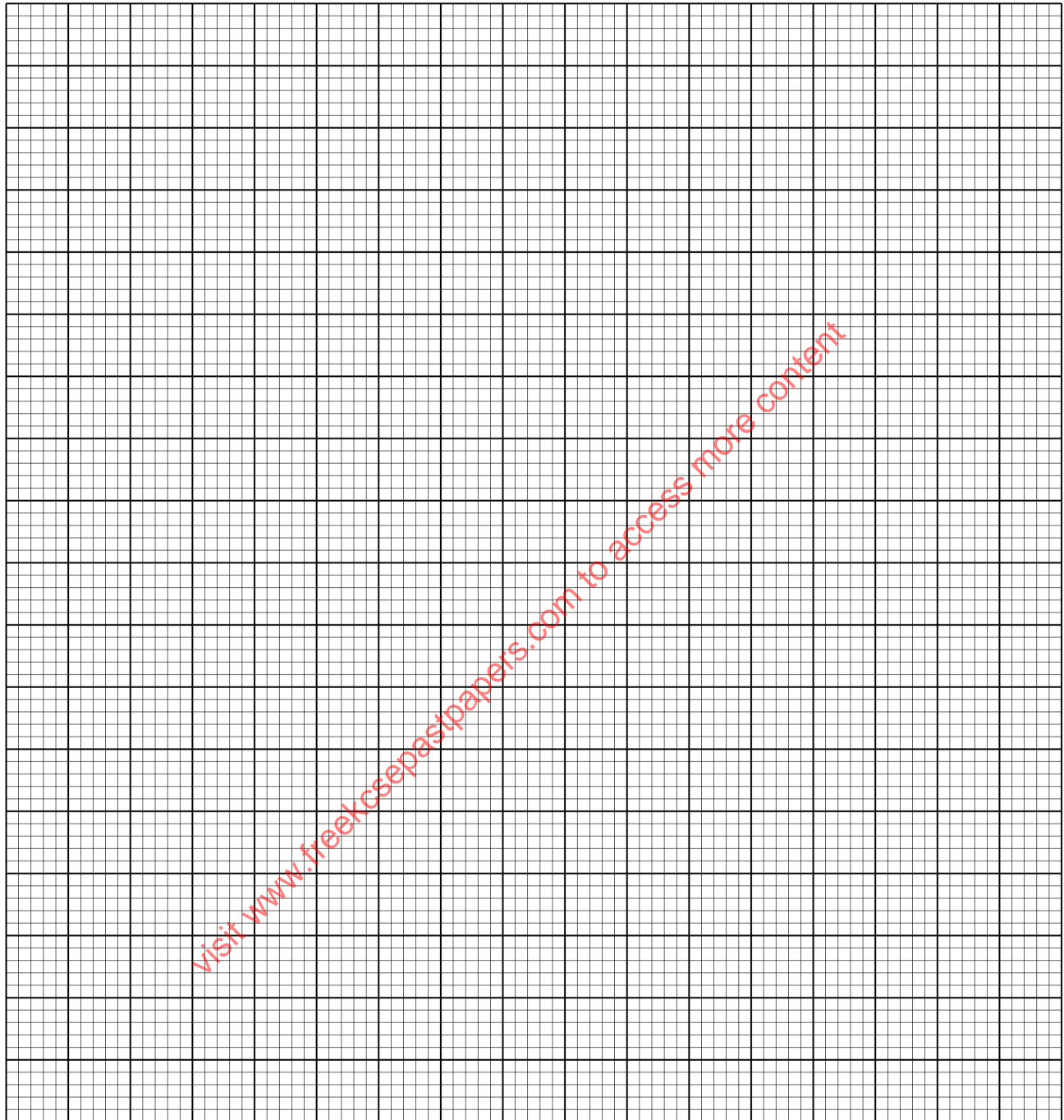
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SECTION B

6 In an experiment to determine the energy requirements per day by persons of different sizes at rest, the following results were compiled.

Weight of individual (kg)	Energy requirement per day at rest (KJ)
5	350
15	250
25	200
35	180
45	165
55	155
65	150
75	145

a) Using a suitable scale, draw a graph of the amount of energy required per day against the weight of individuals. (6mks)



b) From the graph, determine the difference in energy requirements between persons weighing:
i) 20kg and 30kg. (1mk)

.....

ii) 40kg and 70kg. (1mk)

.....

c) Account for the difference in energy requirements per kilogram of body weight between individuals of 5kg and 75kg. (3mks)

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d) i) On the graph drawn above, draw a curve that would represent energy requirements of a reptile instead of a man. (1mk)

ii) Account for the difference between the two curves. (2mks)

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e) Other than body size, state any **three** factors that determine energy requirement in man. (3mks)

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f) Name food substrate that provides the most and least energy per unit mass:
i) Most energy. (1mk)

.....

ii) Least energy. (1mk)

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g) Write down a balanced chemical equation of complete oxidation of glucose molecule. (1mk)

7 Discuss seed dormancy, its importance, causes and ways of breaking it. (20mks)

8a) Explain how blood sugar is regulated in the human body. (12mks)

b) Explain the fate of digested protein. (8mks)

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