MASENO SCHOOL

2025 MOCK EXAMINATION

Kenya Certificate of Secondary Education

231 / 2 - BIOLOGY (THEORY) **Monday 21st July, 2025** **11.00 a.m. - 1.00p.m.**	**Unique Identifier No.....** **Signature.....**

INSTRUCTION TO CANDIDATES

a) *Write your name and admission number in the spaces provided above.*
b) *Sign and write the date of examination in the spaces provided above*
c) *This paper consists of **two** sections; **A** and **B***
d) *Answer all the questions in section **A** in spaces provided*
e) *In section **B**, answer question **6** (**compulsory**) and either question **7** or **8** in the spaces provided after question **8.***
f) *This paper consists of **12** printed pages*
g) *Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.*
h) *Candidates should answer all the questions in English.*

For examiners use only

Section	Question	Maximum Score	Candidate's Score
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
B	6	20	
	7/8	20	

SECTION A (40 MARKS)

*Answer **ALL** questions in this section in the spaces provided after each question*

1. In a certain species of beans, the gene for white seedcoat and that for red seed coat are codominant. When the **F1** offspring were selfed, they produced **F2** offspring in the following proportion; 1 white: 2 white and red patches: 1 red.

   (a) Using letter **R** to represent the gene for red seed coat and **W** to represent the gene for white seed coat, work out the genotype of **F2** generation (5 marks)

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   (b) Name any two traits in human beings that show codominance (2 marks)

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   (c) State any one application of genetic engineering in the field of medicine (1 mark)

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2. The diagram below represents a specialised animal cell. Examine it.

(a) Identify the enzyme present in the above cell (1 mark)

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(b) Describe the role of the enzyme named in (a) above (2 marks)

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(c) Explain why transportation of carbon (IV) in the above cell is advantageous (3 marks)

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(d) Describe the role of calcium ions in blood clotting (2 marks)

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3. In an experiment, a group of Maseno School students labeled three test-tubes **A**, **B** and **C**. They the added starch solution, amylase and water into the test-tubes as indicated in the table below.

Test-tube	Content
A	2 ml of starch+ 2 ml of amylase + 5 ml of distilled water
B	2 ml of starch+ 2 ml of amylase + 2 ml of distilled water
C	2 ml of starch+ 2 ml of amylase

The students added two drops of iodine solution in each test-tube, placed the test-tubes in water bath maintained at 37 ^{0}C and noted the time taken for blue-black colour to disappear in each test-tube.

(a) What was the aim of the experiment? (1 mark)

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(b) Identify the test-tube in which the blue-black colour took the longest time to disappear (1mark)

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(c) Explain your answer in (b) above (3 marks)

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(d) Explain why it is necessary to produce pancreatic amylase yet food is mixed with salivary amylase in the mouth (2 marks)

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(e) Explain why proteases are produced in inactive form (1 mark)

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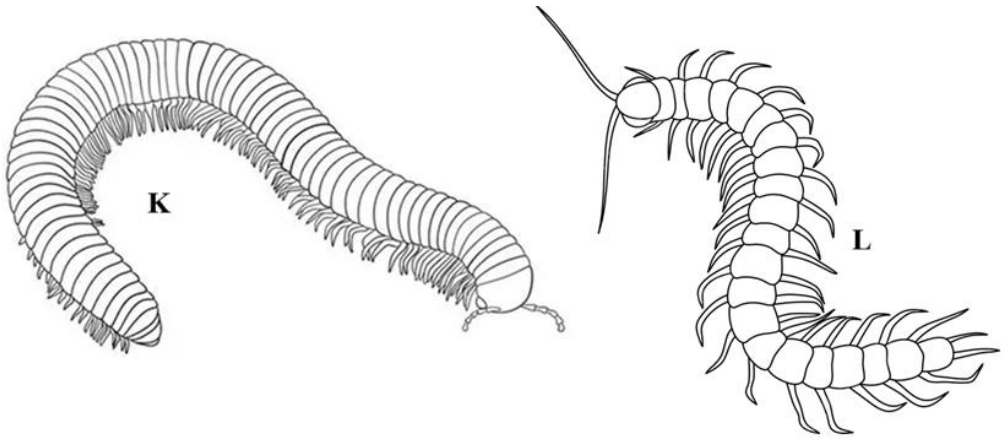
4. The photographs below represent animals belonging to a certain phylum under phylum Arthropoda.

Examine them.



(a) Identify the class to which each of the above animals belongs to

K (1 mark)

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L (1 mark)

…….

(b) Give two features used to place the above animals into their classes (2 marks)

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(c) Identify the mode of nutrition of the above animals

K

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L

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(d) Explain the ecological role of animal L in the ecosystem (2 marks)

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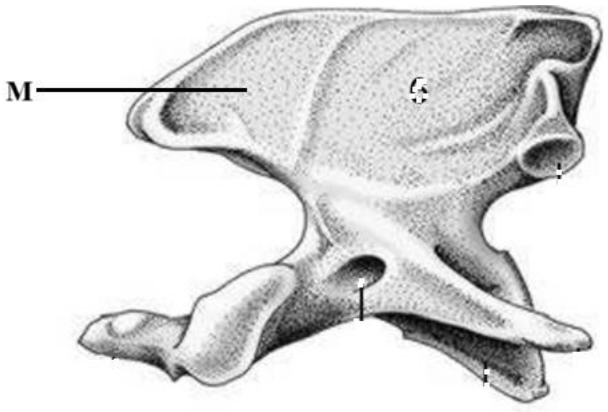
5. The diagram below shows a mammalian bone. Examine it



(a) Identify the view of the bone shown above (1 mark)

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(b) Give a reason for your answer in (a) above (1 mark)

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(c) With two reasons, identify the part of the body where the above bone was obtained

Region (1 mark)

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Reasons (2 marks)

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(d) How does the part labelled M adapt the above bone to its function (2 marks)

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(e) State two ways in which human skeleton offer protection (2 marks)

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SECTION B (40 Marks)

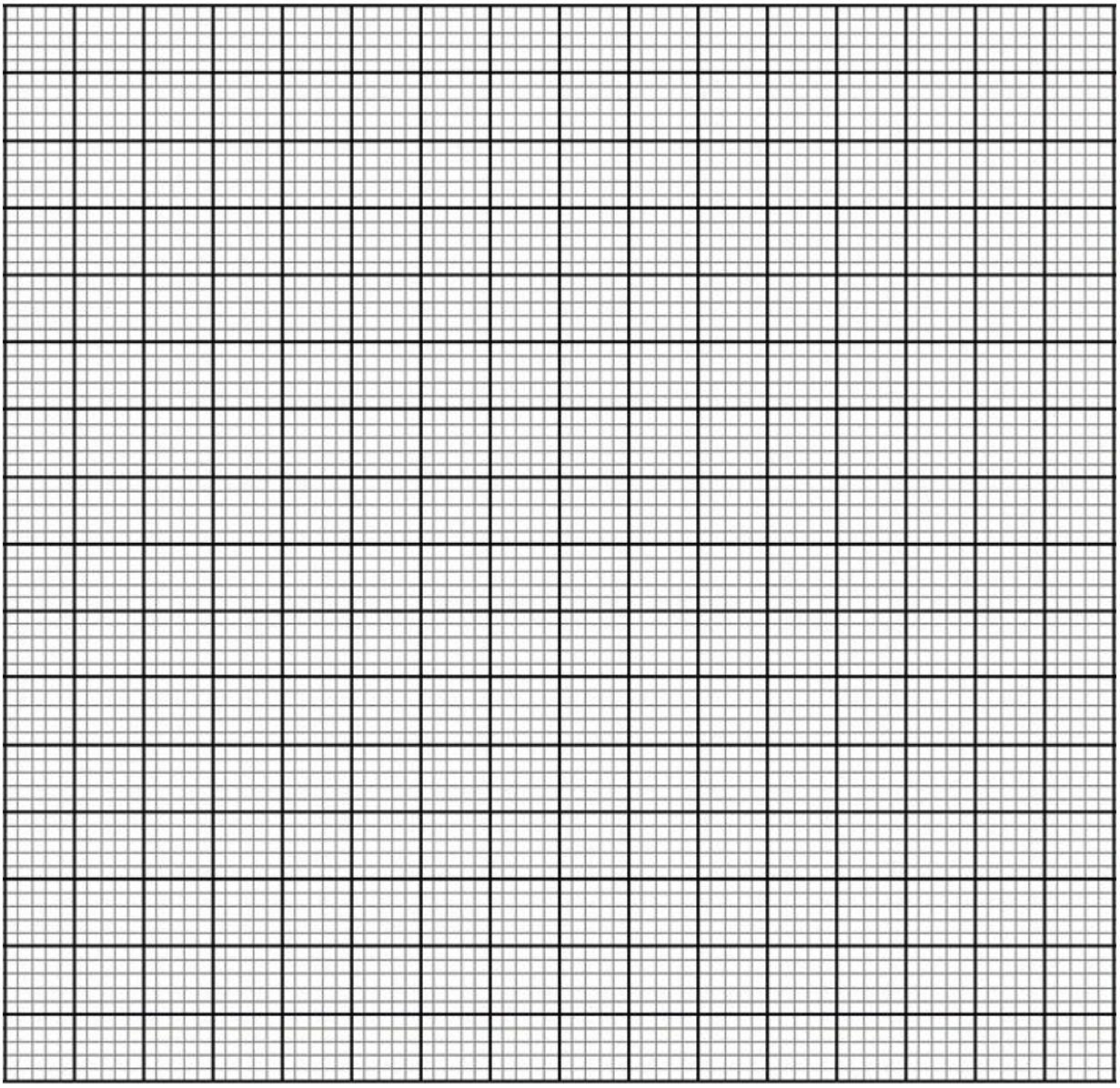
*Answer question **6 (compulsory)** and either 7 or 8 in the space proved after question 8*

6. The table below shows the relationship between environmental temperature and body temperature of two animals P and Q.

Time (hours)	0700	0900	1100	1300	1500	1700	1900	2100
Environmental temperature (^{0}C)	25	28	30	38	35	30	27	24
Body temperature of animal P (^{0}C)	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5
Body temperature of animal Q (^{0}C)	25	28	30	38	35	30	27	24

(a) Plot a graph of temperature of body temperature of animals P and Q against time of the day

(8 marks)



(b) With a reason in each case, classify animals P and Q based on thermoregulation

i) P (2 marks)

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ii) Q (2 marks)

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(c) State two advantages of animal P over Q (2 marks)

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(d) Give one disadvantage of animal Q (1 mark)

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(e) Explain why the temperature of animal P was constant throughout the study period (3 marks)

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(f) State three behavioral mechanisms used by animal Q to regulate its body temperature (3 marks)

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7. (a) Explain how a gill is adapted to its function (10 marks)

(b) Describe the role of osmosis in plants (10 marks)

8. (a) Describe the role of hormones in reproduction in males (10 marks)

(b) Describe the events that take place during prophase I (10 marks)

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