

NAME.....ADM NO.....CLASS.....DATE.....

231/2

BIOLOGY

PAPER 2

TIME: 2 HOURS

TERM TWO 2022

MECS CLUSTER JOINT EXAMINATION

Kenya Certificate of Secondary Education

INSTRUCTIONS TO STUDENTS

- Write your name and admission number in the spaces provided above
- Sign and write the date of examination in the spaces provided above
- This paper consists of **TWO** sections A and B.
- Answer **ALL** questions in section A in the spaces provided
- In section B answer **question 6(compulsory)** and either question **7** or **8** in the spaces provided after question 8
- This paper consists of 12 printed pages
- Students should check the question paper to ascertain that all the pages are printed and that no questions are missing

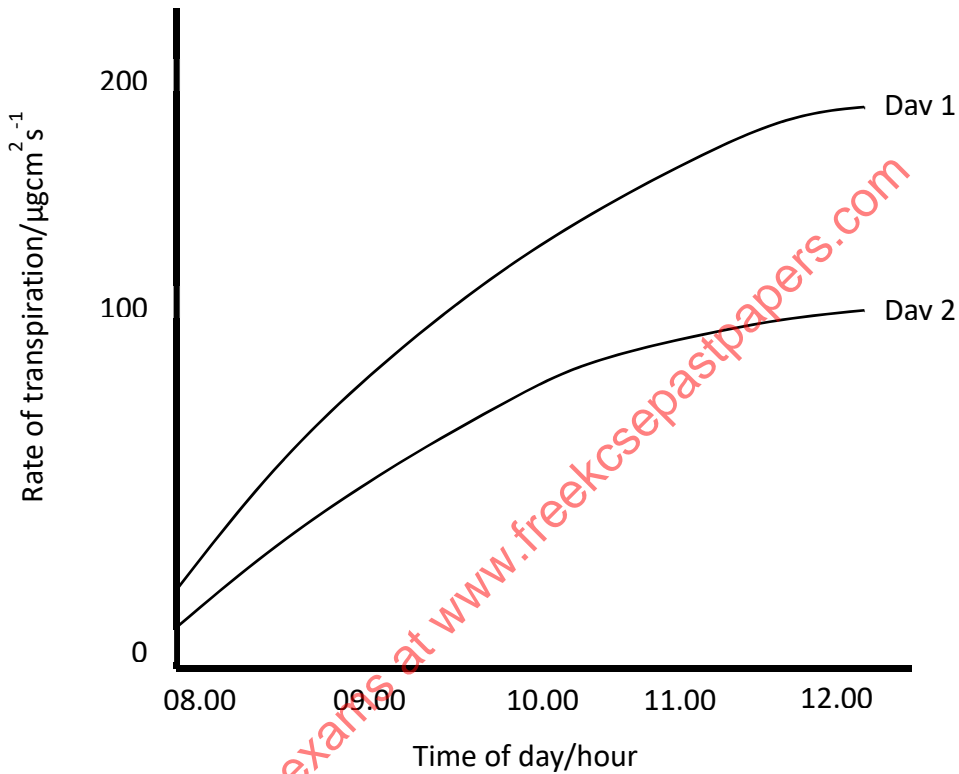
FOR EXAMINERS USE ONLY

Section	Question	Maximum score	Candidate score
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
B	6	20	
	7	20	
	8	20	
	TOTAL	80	

SECTION A (40 marks)

Answer *all* the questions in this section in the spaces provided.

1. The graph below shows the rate of transpiration of the same plants on two consecutive mornings, day 1 and 2.



- a) (i) Give two environmental factors that could account for the difference between day 1 and day 2 (2mks)

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- (ii) Explain how the environmental factors named (a) (i) above could have caused the difference between day 1 and day 2. (2mks)

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b) Name two forces involved in movement of water up the xylem. (2mks)

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c) Name the strengthening material found in the following tissue in a stem:

i) Sclerenchyma (1mark)

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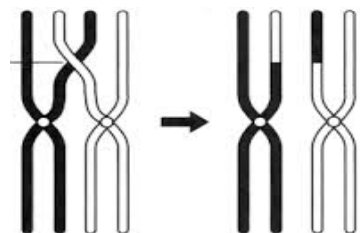
ii) Collenchyma (1 mark)

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2. a) A young mother delivered a baby at Muranga Hospital, which was taken to the nursery shortly after delivery. When she was brought the baby later, she felt that it was the wrong baby. When she got home, she decided to contest the issue in a court of law. The blood tests showed that she was blood group AB and her husband was group O and the baby was blood group O. Use a genetic cross to find out if her claims were true. (5mks)

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b) The figure below is a diagram of a pair of homologous chromosomes during meiosis.



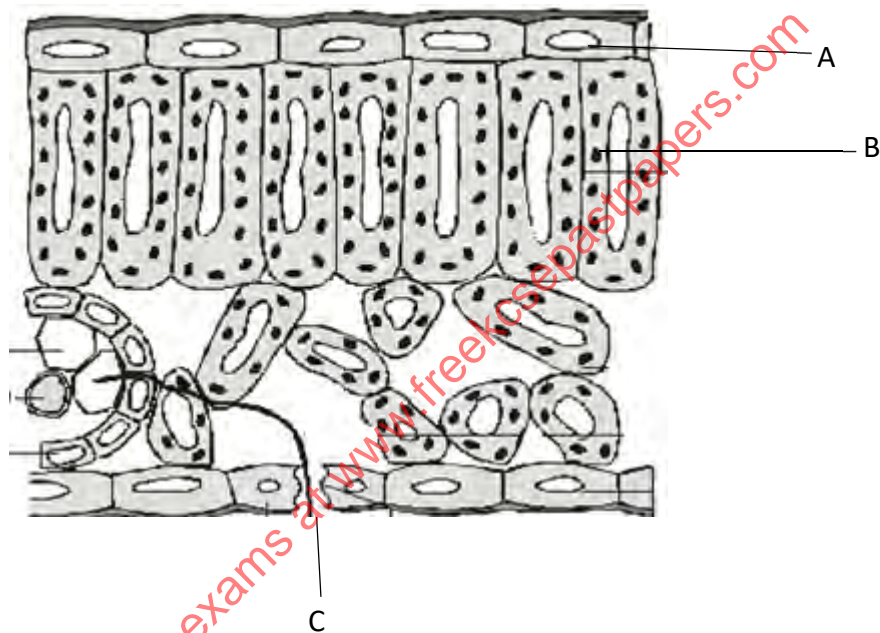
i) Name the process shown above (1mk)

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ii) Explain the effect of the process named in (b) (i) above on linked genes. (2mks)

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3. The diagram below shows a vertical section through the part of a leaf of a mesophyte.



a) Label cell A and organelle B (2marks)

A-

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B-

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b) State two functions of the part labelled C. (2mks)

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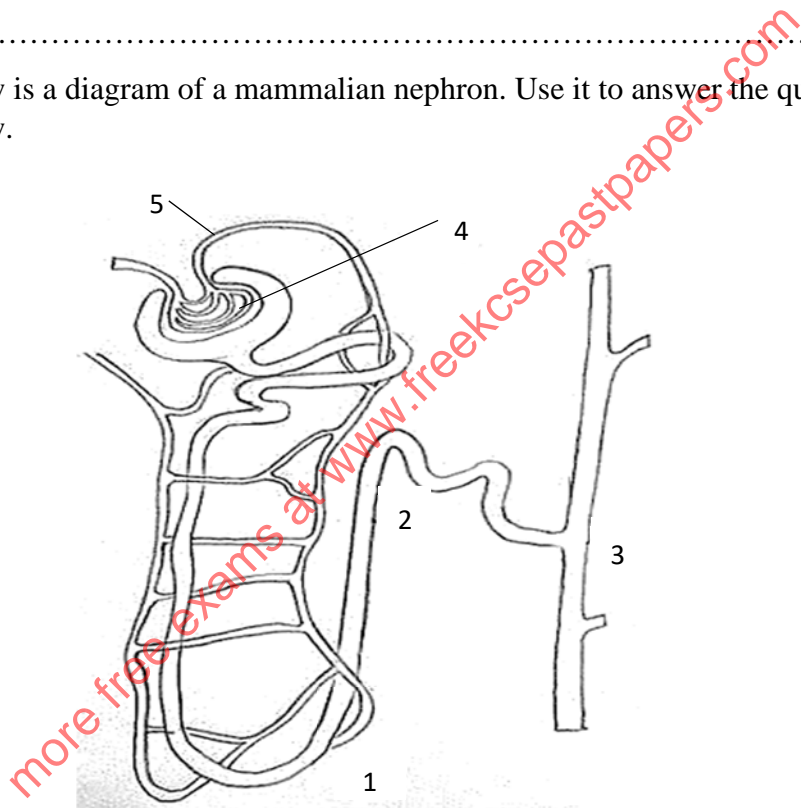
c) Give two differences between the structure shown above and that of a floating hydrophyte. (2marks)

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d) Give two observable features that adapts the structure above to photosynthesis. (2 marks)

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4. Below is a diagram of a mammalian nephron. Use it to answer the questions that follow.



a) Name part 4. (1mark)

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b) Explain what happens to the concentration of sodium ions between 1 and 2. (2 marks)

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c) i) Name the hormone that controls the amount of urine produced in the kidneys. (1 mark)

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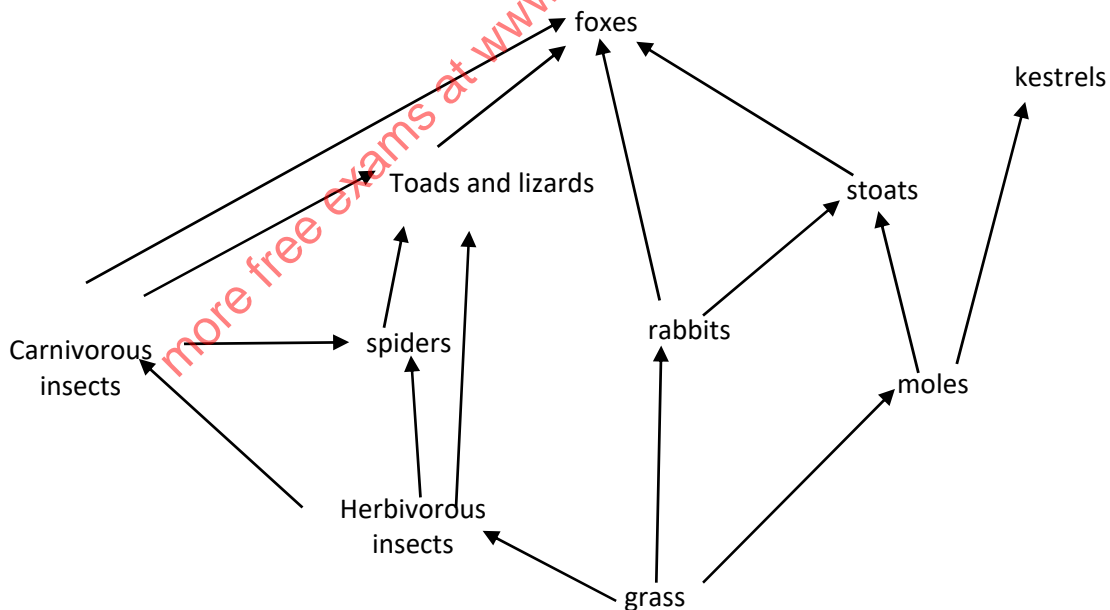
ii) How will the concentration of urine be affected at region 3 in the absence of the hormone mentioned in (c) (i) above. (2mks)

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d) What will happen at point 4 if there was partial constriction at point 5? (2marks)

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5. The diagram below shows a food web. Study it and answer the questions that follow.



a) Write two food chains with foxes as the quaternary consumer. (2mk)

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b) Name the organism with

i) The highest biomass (1 mark)

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ii) The highest number of predators (1 mark)

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c) State two possible effects on the ecosystem if kestrels migrated. (2 marks)

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d) Explain why primary productivity reduces with increase in depth in an aquatic ecosystem. (2marks)

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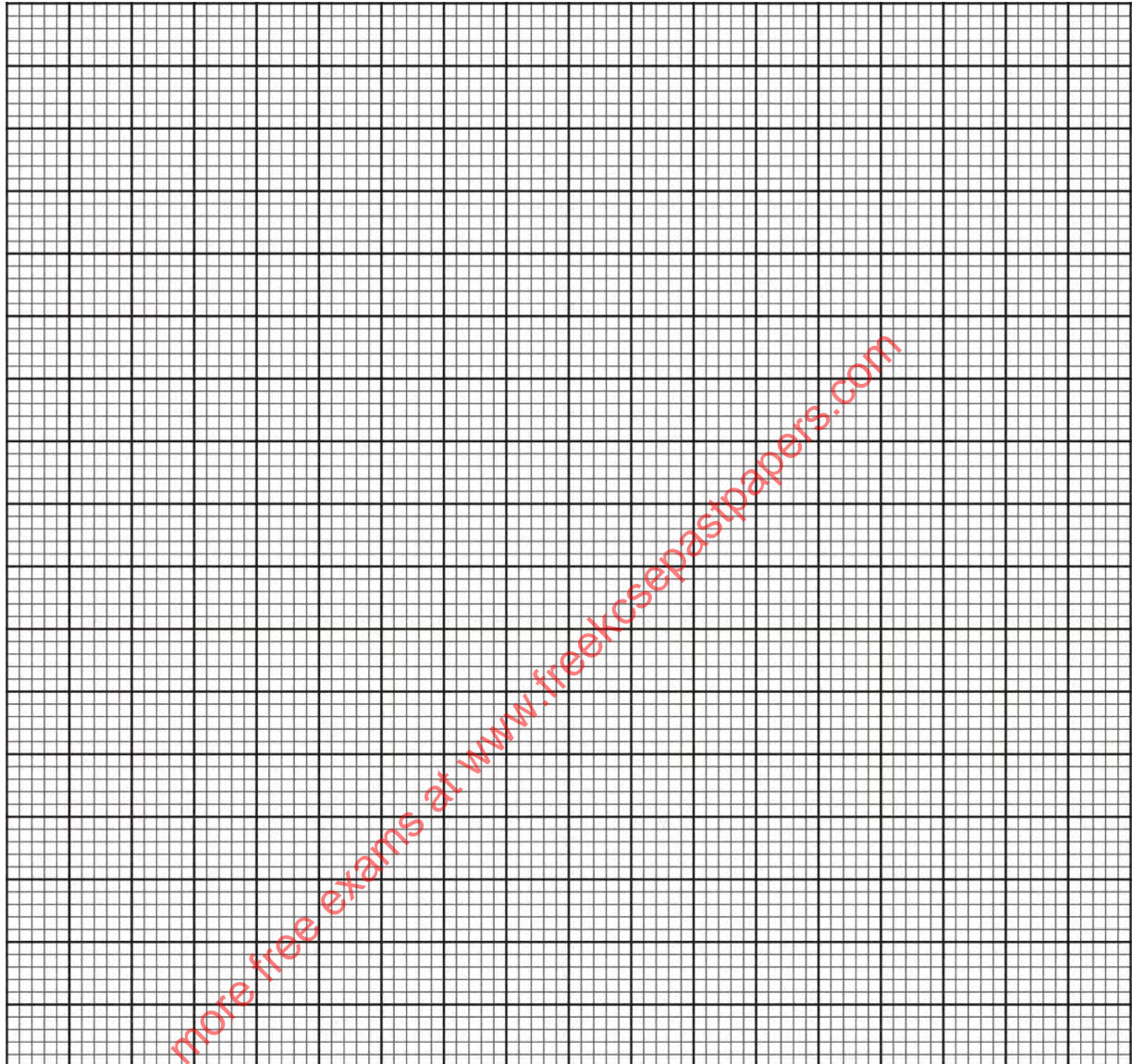
SECTION B

Answer question 6 (**compulsory**) and **either** question 7 or 8

6. During germination and growth of a cereal, the dry weight of endosperm, the embryo and total dry weight were determined at two-day intervals. The results are shown in the table below.

Time after planting	Dry weight of endosperm	Dry weight of embryo (mg)	Total dry weight (mg)
0	43	2	45
2	40	2	42
4	33	7	40
6	20	17	37
8	10	25	35
10	6	33	39

- a) Using the same axes, draw graphs of dry weight of endosperm, embryo and the total dry weight against time. (8 marks)



- b) What is the total dry weight on day 5? (1 mark)

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- c) Account for:

- i) Decrease in dry weight for endosperm from day 0 to 10. (2 marks)

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ii) Increase in dry weight of embryo from day 0 to 10. (2 marks)

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iii) Decrease in total dry weight from day 0 to day 8. (2 marks)

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iv) Increase in total dry weight after day 8 (1 mark)

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d) State two factors that causes seed dormancy in each of the following:

i) Within a seed (2 mark)

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ii) Outside a seed. (2 mark)

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- 7. a) A student sitting under a shade of a tree, on a sunny day, shifted the eyes from looking at an aero plane in the sky to reading a page on her book. Describe the changes that occurred in her eye. (15 marks)
- b) Explain how a neuron is adapted to its function. (5marks)

- 8. a) Describe digestion of milk in the stomach (10 marks)
- b) Describe assimilation of the end products of digestion in mammals. (10 marks)

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