Name ..... Index No. .....

231/2 Candidate's signature .....

BIOLOGY Date .....

Paper 2
(Theory)
July/August 2018

Time 2 hours

FORM FOUR END OF SECOND TERM EXAM

Kenya Certificate of Secondary Education

BIOLOGY

Paper - 231/2

July/August 2018

Time: 2 hours

INSTRUCTIONS TO CANDIDATES

- Write your name and index number in the spaces provided above.
- Sign and write the date of the 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 questions 6(Compulsory) and either question 7 or 8 in the spaces provided after question 8.

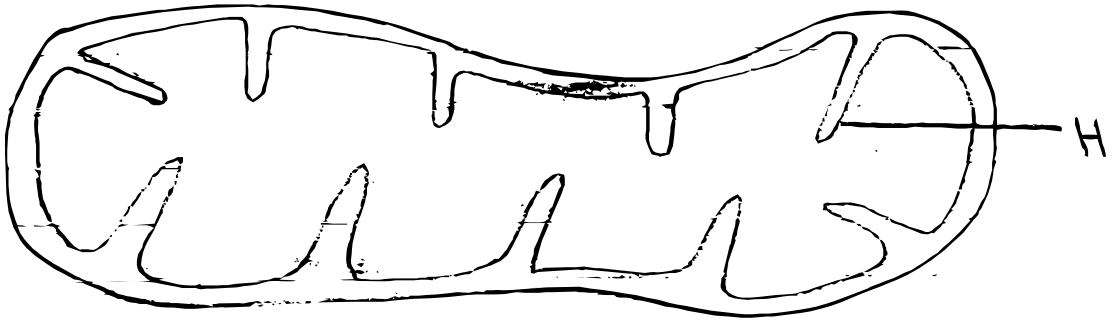
EXAMINER'S USE ONLY

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

This paper consists of 8 printed pages
Candidates should check the question paper to ensure that all the printed pages are printed as indicated and no questions are missing.

SECTION A : (40 marks)
Answer ALL the questions in this section in the spaces provided.

1. The diagram below shows an organelle that is found in most cells. Study it and answer the questions that follow.



a. i. Name the organelle. (1 mark)

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ii. State the function of the organelle in a (i) above. (1 mark)

.....

b. i. Give the full name of the major chemical compound that is found in the organelle. (1 mark)

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ii. Identify the gas that is required in order to form the compound you have stated in b (i) above. (1 mark)

.....

c. Give the name of the structure labeled H and state its function. (2 marks)

H .....

Function.....

.....

d. i. In which cells between spermatozoa or ova would you expect to find a high number of the organelles named in a (i) above? (1 mark)

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ii. Give a reason for your answer in d (i) above. (1 mark)

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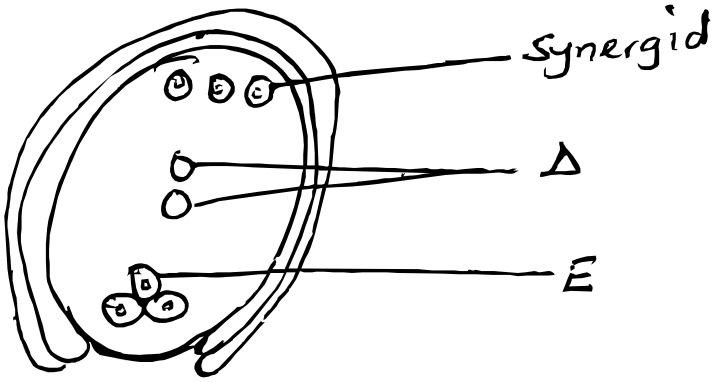
2. The diagram below shows an embryo sac.



a. Name the structures labeled D and E. (2 marks)

D .....

E .....

b. On the diagram label the integuments. (1 mark)

c. On the diagram, mark using letter X the point at which the pollen tube enters embryo sac. (1 mark)

d. What is the function of the pollen tube? (2 marks)

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e. State two factors that hinders self pollination in flowering plants. (2 marks)

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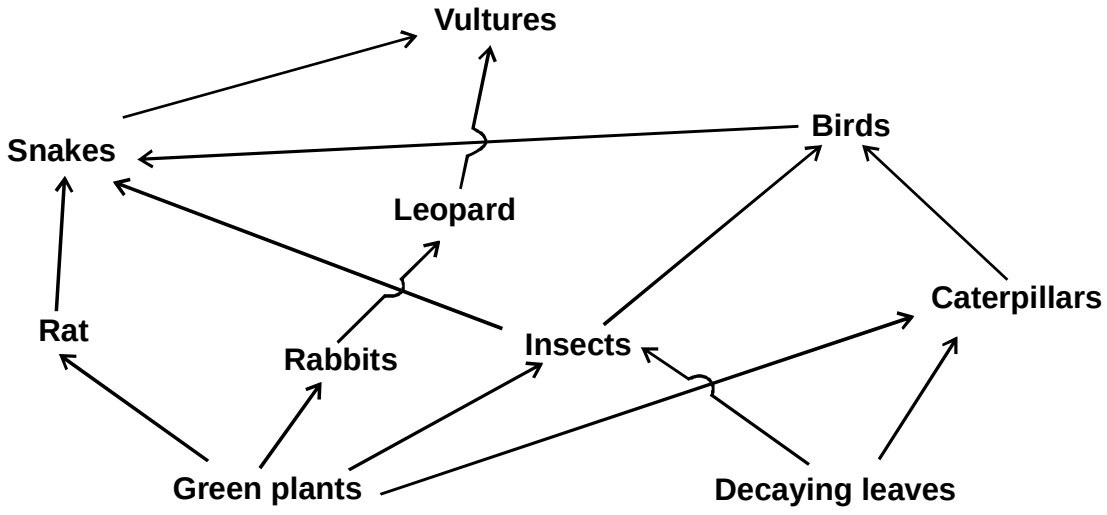
3. Study illustration below.



a. Identify the ecosystem. (1 mark)

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b. i. Which organism have the least biomass in the food web? (1 mark)

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ii. Explain your answer in b (i) above. (1 mark)

.....

c. Name the trophic level occupied by the following organisms.
i. Insects (1 mark)

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ii. Leopards. (1 mark)

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d. Construct a food chain in which the vulture is a quaternary consumer. (1 mark)

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e. i. Name one group of organisms not shown in the food web but play an important role in the ecosystem. (1 mark)

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ii. What is the role of the organisms you named in d (i) above? (1 mark)

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4. During a biology practical lesson, the teacher provided students with the following apparatus:
- A pooter
- A scalpel
- Specimen bottle
- A pair of forceps
- Sweep net
- Chloroform

a. Give the precautions the biology teacher gave to students before the practical when collection of specimens begun. (3 marks)

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b. What was the function of the following apparatus?

i. Pooter (1 mark)

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ii. Sweep net (1 mark)

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iii. Chloroform. (1 mark)

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c. Other than observation, name other two scientific skills developed by studying biology. (2 marks)

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5. Hemophilia or bleeders disease is a condition in which blood takes a longer time than usual to clot. This is due to lack of certain blood protein. The gene for hemophilia is recessive to the gene for normal clotting factor and is found on the X - Chromosome.

a. Explain why there are only female carries for hemophilia and no male carries for traits. (2 marks)

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b. A carrier female for hemophilia trait married a normal male. Work out the possible genotypes of the children. Let letter H represent the normal gene and letter h represent the gene for hemophilia. (4 marks)

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c. Name two other sex linked trait in human. (2 marks)

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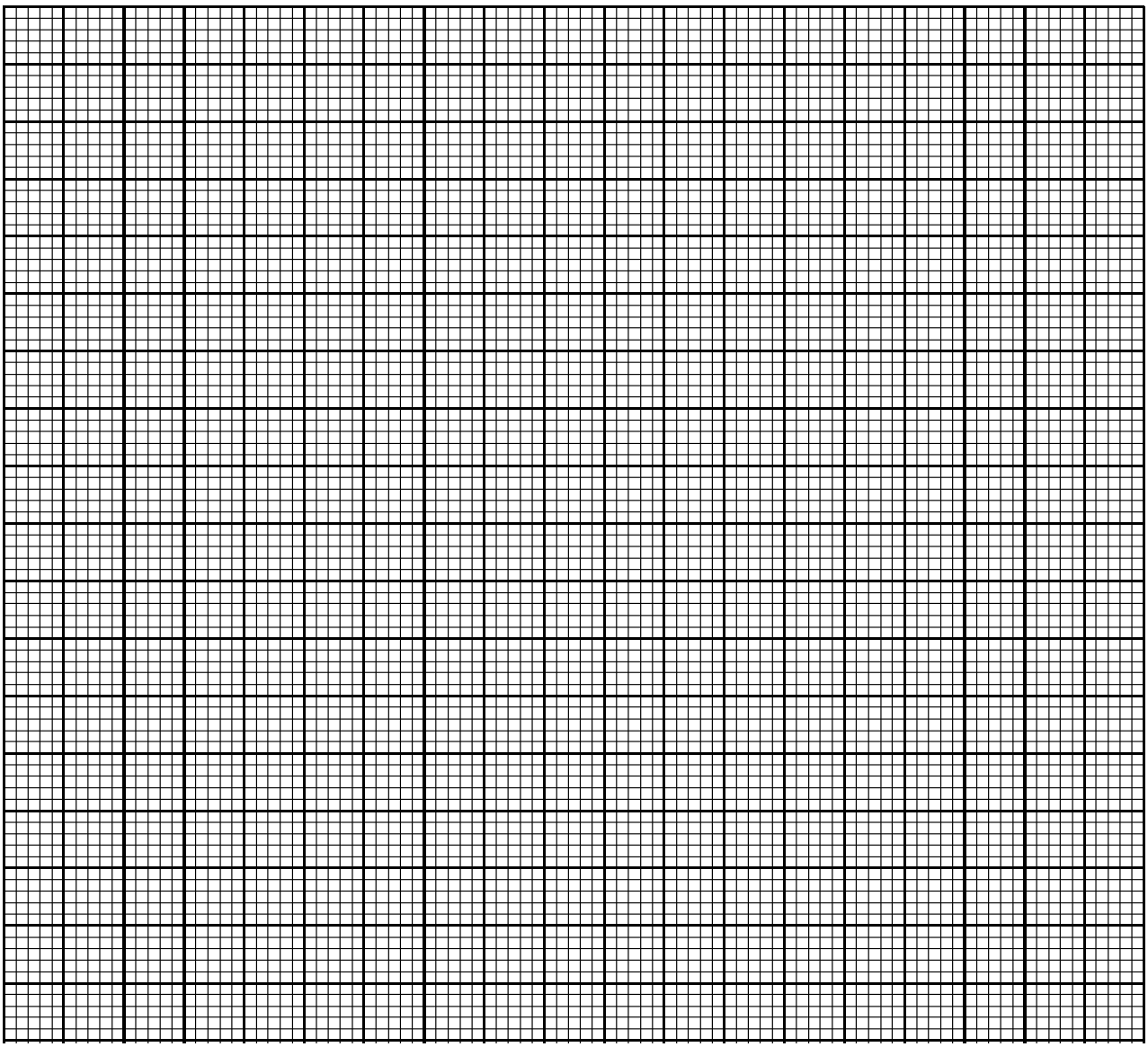
SECTION B. (40 marks)

6. The amount of water particles that moved across cell membrane was determined at various temperature. The data collected is as in the table below.

Temperature (°C)	0	5	10	15	20	25	30	35	40	45	50	55	60
Water particles that moved across a cell membrane	0	2	5	13	20	50	80	95	93	73	45	20	0

a. Draw a line graph to represent the amount of water particles that moved across the cell membrane against temperature. (6 marks)



b. Account for the shape of the curve between;

i. 200 - 350 C (2 marks)

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ii. 400 - 600 C. (3 marks)

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c. i. Name and define the process by which water particles moved across the cell membrane. (2 marks)

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ii. Other than the temperature, state and explain another factor that affect the rate of the process you named in c (i) above. (2 marks)

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d. i. If the water molecules were moving across the cell membrane in to a plant cell, name the state at which the cell would be if it was at 350 - 400 for 20 minutes. (1 mark)

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ii. State two forces that would be involved in the plant cell to result in the state of cells you named in d (i) above. (2 marks)

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e. i. State what would be expected if animal cells were used in d (i) above in stead of plant cells. (1 mark)

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ii. Explain why plant cells behave differently from animal cells. (1 mark)

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7. a. How are xerophytes adapted to their habitat? (10 marks)

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b. Explain how the mammalian skin is adapted to thermoregulation. (10 marks)

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8. Discuss the various evidences which show that evolution has taken place. (20 marks)

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