NAME ……..…… Index No. ……

Candidate's Signature:…….... Date: ……..…..……..

Adm No. ……

231/2
BIOLOGY
PAPER 2
(THEORY)
TIME: 2 hours

Keya Certificate of Secondary Education (KCSE)4MCK Joint exam
BIOLOGY
PAPER 2
(THEORY)
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
This paper consists of two sections, A and B
In section B, answer question 6 (compulsory) and either question 7 or 8 in the spaces provided after question 8.
Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

For Examiner's Use Only

QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
1	8	
2	8	
3	8	
4	8	
5	8	
6	20	
7	20	
8	20	
TOTAL		

SECTION A – 40 MARKS

1. A cross section between two tall plants produced a mixture of tall and dwarfs plants at a ratio of 3:1 respectively.

   a) If the offspring were selfed; carry out a genetic cross in which the F2 generation were half tall and half dwarf. Show your working. (3 marks)

Use letter T

b) State the difference between co-dominance and incomplete dominance. (1 mark)

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c) Explain the meaning of the following chromosomal mutations. (3 marks)

i) Deletion

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ii) Inversion

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iii) Translocation

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d) Name a disorder in man caused by non-disjunction. (1 mark)

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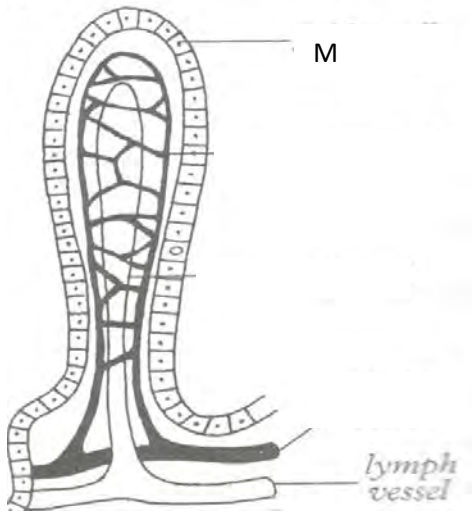
2. The diagram below represents a structure obtained from the alimentary canal of a cut.



a) Identify the structure (1 mark)

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b) State the function of the part labeled M. (1 mark)

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c) State three adaptations of the above structure to its function. (3 marks)

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d) Give a reason for each of the following practices when testing for starch in a leaf.

(i) Boiling the leaf in water for sometime. (1 mark)

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(ii) Boiling the leaf in methylated spirit. (1 mark)

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(iii) Not directly boiling the leaf in methylated spirit on flame. (1 mark)

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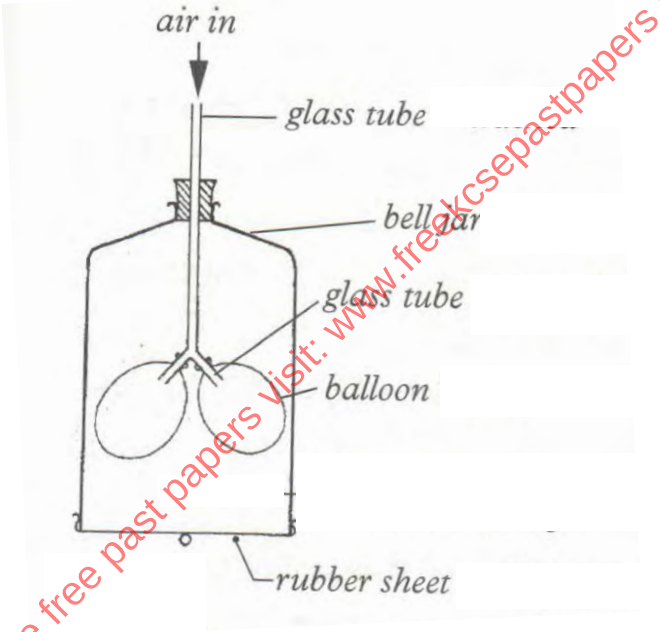
3.The diagram below represents a model to demonstrate the breathing system in a mammal. Study it carefully and answer the questions that follow



a) State the part in a mammal represented by each of the following parts in the model.

(4 marks)

(i) Bell jar

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(ii) Glass tube

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(iii) Balloons

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(iv) Rubber sheet

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b) State the difference between the above model and the structures in the actual mammal.

(3 marks)

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c) What is the role of the guard cells in a plant? (1 mark)

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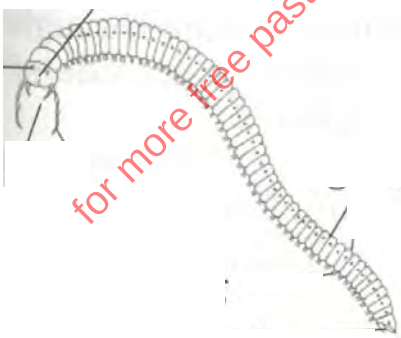
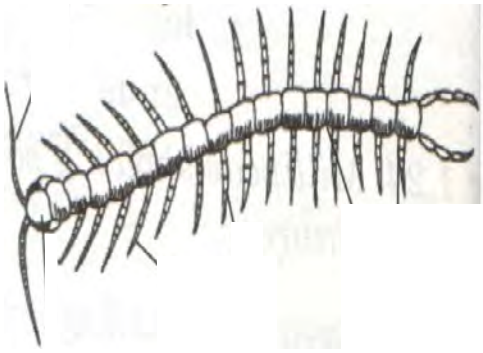
4. Students collected the following organisms for study. Their teacher said that the organisms belonged to two different classes.





a) With a reason identify the class for each. (3 marks)

A

Class

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Reason

……

B

Class

……

Reason

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b) State two similarities between the two organisms. (2 marks)

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c) Why is it necessary to classify organisms. (3 marks)

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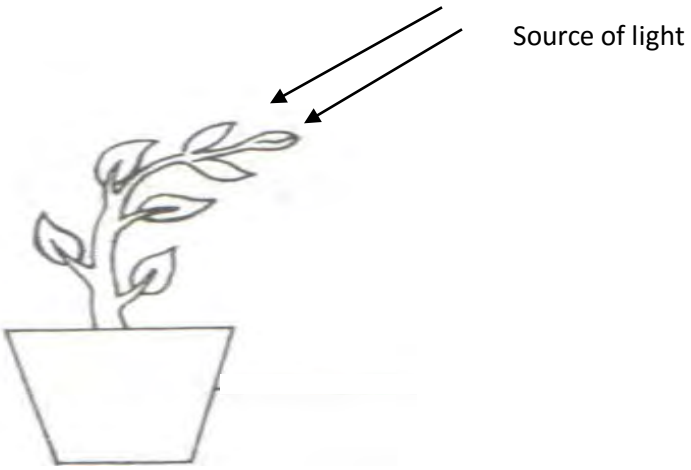
5. The diagram below represents a potted plant transferred to a dark room with an open window for two days



a) (i) Name the type of response shown by the plant above. (1 mark)

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(ii) What is the survival value of the above response to the plant. (1 mark)

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(iii) Explain what led to the above curvature (3 marks)

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b) Tom was reading a newspaper from outside where there was a lot of light. Briefly explain what changes occurred in his eyes when he entered into a dark room. (3 marks)

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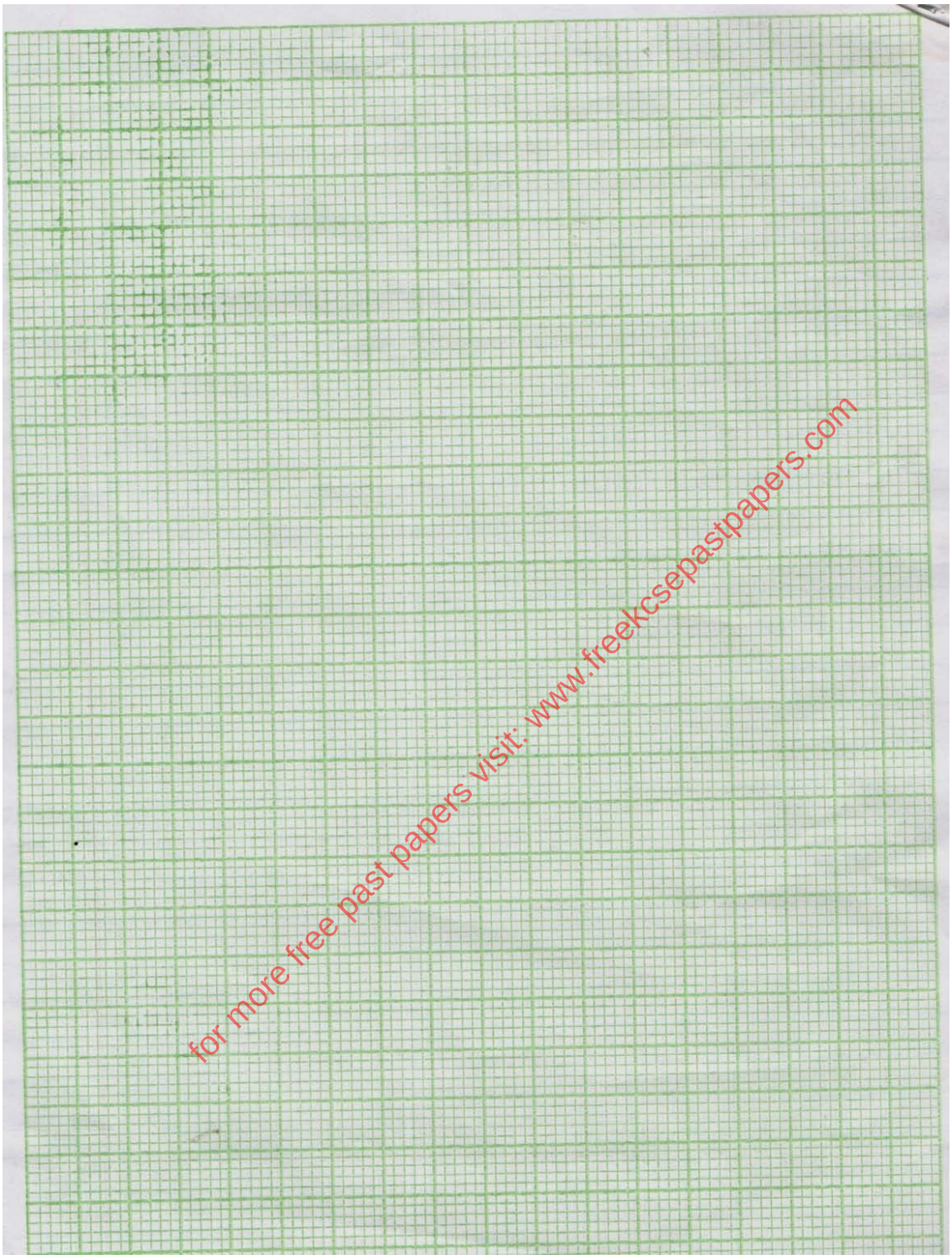
SECTION B (40 MARKS)

*Answer question 6 (**compulsory**) and **either** question 7 or 8 in the spaces provided.*

6. In a school invaded by mosquitoes and cockroaches, students collected a data on the population of each species for a period of two weeks. The results were tabulated in the table below.

DAY	1	3	6	9	12	15
No. OF MOSQUITOES	35	60	130	210	260	250
NO. OF COACKROACHES	20	40	56	70	75	80

a) On the same axes plot the graphs of the two populations against time. (7 marks)



b) State the most suitable equipment to collect each of the species (2 marks)

Cockroaches ……..

Mosquitoes ……

c) Account for the shape of the curve for the mosquitoes between (4 marks)

(i) 1^{st} and 3^{rd} day

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(ii) 12^{th} and 15^{th} day

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d) Calculate population growth rate of the cockroaches between the 3^{rd} and the 9^{th} day (2 marks)

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e) Explain why

(i) The cockroach is better adapted in the environment than the mosquito. (1 mark)

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(ii) The population growth of the mosquitoes is not affected by the population of the cockroaches. (2 mark)

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f) State three adaptations of the submerged hydrophytes to their photosynthetic function. (3 marks)

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7. a) (i) In evolution of man give three features associated with the *Homo erectus*. (3 marks)

(ii) State three limitations of fossils as an evidence of evolution. (3 marks)

b)(i) Giving an example in each case, explain the meaning of the following terms as used in Evolution (6 marks)

Homologous structures.

Analogous structures.

Vestigial features.

(ii) Give three examples of natural selection in action. (3 marks)

c) Briefly explain Charles Darwin's idea of evolution. (5 marks)

8. Discuss the menstrual cycle in man. (20 marks)