THE KENYA NATIONAL EXAMINATIONS COUNCIL
Kenya Certificate of Secondary Education

231/2 – BIOLOGY – Paper 2
(THEORY)
Nov. 2018 – 2 hours

Name ..... Index Number .....

Candidate's Signature ..... Date .....

Instructions to candidates

(a) *Write your name and index 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 the 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.***

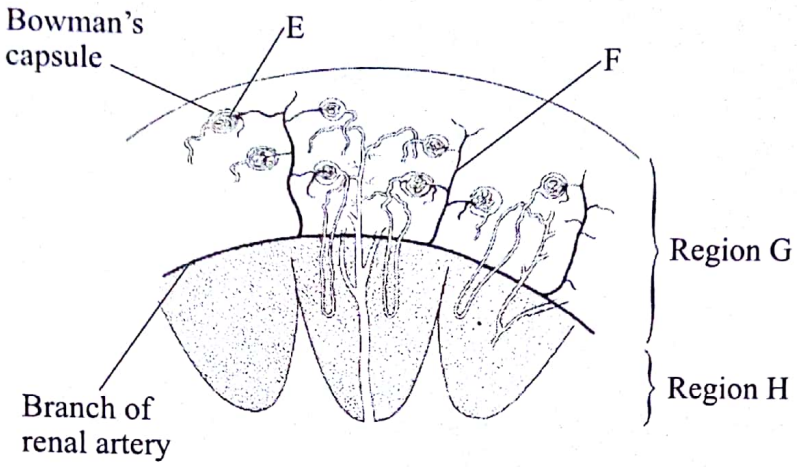
For Examiner's Use Only

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

SECTION A (40 marks)

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

1. The diagram below illustrates a section of the mammalian kidney.



(a) Name the structures labelled E and F.

E ..... (1 mark)

F ..... (1 mark)

(b) Explain the processes that take place in the regions labelled G and H.

Region G (3 marks)

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Region H (3 marks)

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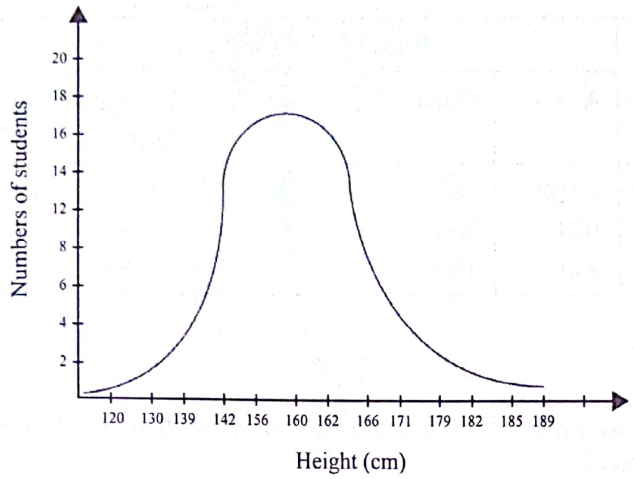
2. Below is a graphical representation of students' height in a classroom.



(a) Name the type of curve illustrated. (1 mark)

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(b) (i) State the type of variation represented by the curve. (1 mark)

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(ii) State **two** meiotic processes that lead to variation among organisms. (2 marks)

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(iii) Explain the role of variation in organisms. (2 marks)

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(c) Explain the need for genetic counselling in present day health facilities. (2 mark)

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3. The amount of blood flowing through certain parts in the mammalian body at different activity levels was measured and results tabulated as shown in the table below.

Parts of the body	Blood flow (cm^3/minute)		
	At rest	During light exercises	During strenuous exercise
Alimentary canal	1,100	780	350
Cardiac muscles	100	200	1,300
Skeletal muscles	900	4600	15,000

(a) Account for:

(i) the high blood-flow through the cardiac and skeletal muscles during strenuous exercises. (4 marks)

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(ii) the results obtained for the alimentary canal at rest. (2 marks)

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(b) Name **two** waste materials excreted by both the skin and the kidneys. (2 marks)

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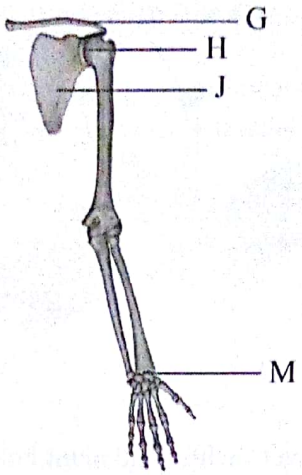
4. The diagram below illustrates the arrangement of bones in a human arm.



(a) Name:

(i) the type of joints formed at points H and M.

H ..... (1 mark)

M ..... (1 mark)

(ii) bone G ..... (1 mark)

(b) Name bone J and state how it is adapted to its functions.

Name: ..... (1 mark)

Adaptation (3 marks)

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(c) State **one** functional difference between a tendon and a ligament. (1 mark)

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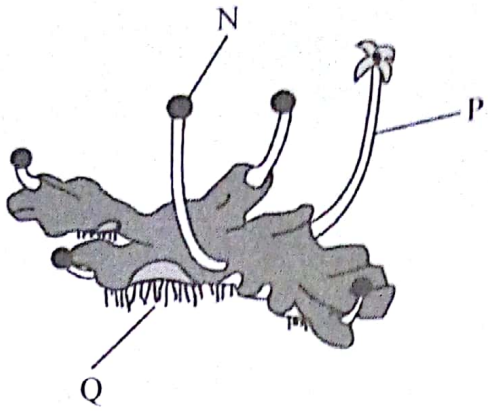
5. The photograph below represents a plant in a certain Division.



(a) (i) Name the Division to which the plant belongs. (1 mark)

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(ii) With reference to the photograph, state **three** observable features of the Division named in a(i) above. (3 marks)

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(b) Name the parts labelled N and P.

N ..... (1 mark)

P ..... (1 mark)

(c) Explain how the part labelled Q is adapted to its functions. (2 marks)

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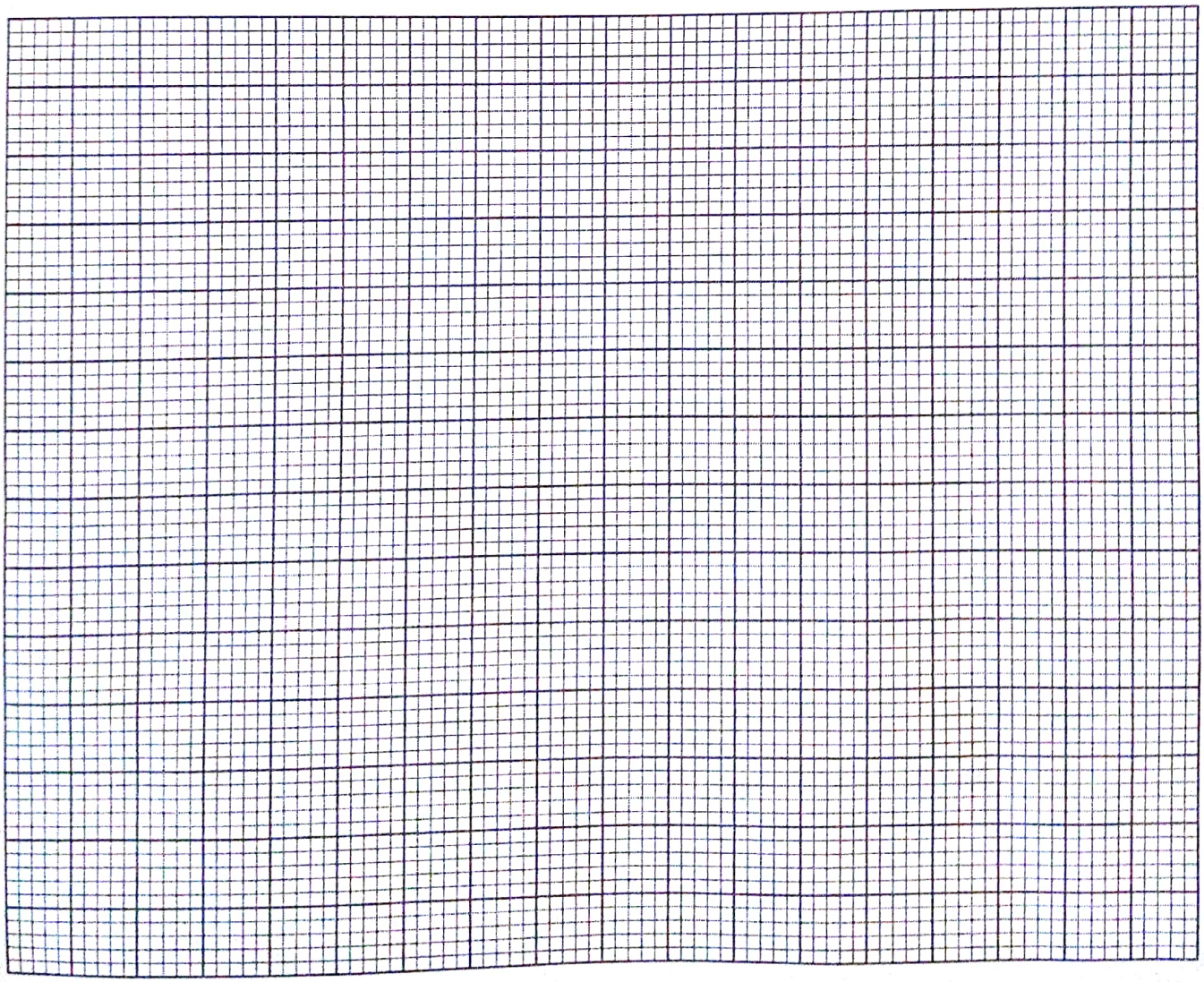
SECTION B (40 marks)

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

6. The effect of auxin concentration on growth response of two parts of a plant, X and Y was investigated over a period of time. The results were tabulated as shown in the table below.

Concentration of Auxin (in parts per million)	10^{-6}	10^{-5}	10^{-4}	10^{-3}	10^{-2}	10^{-1}	1	10^{1}	10^{2}
Percentage inhibition /stimulation on part X	0	40	55	40	0	−45	−90	0	0
Percentage inhibition /stimulation on part Y	0	0	0	25	65	155	210	125	−25

(a) On the same axis, draw line graphs of the effect on growth of the two parts, X and Y (percentage inhibition or stimulation) against the concentration. (8 marks)



(b) With reasons, name the two parts of the plant, X and Y.

X ..... (1 mark)

Reason ..... (1 mark)

Y ..... (1 mark)

Reason ..... (1 mark)

(c) From the graph identify:

(i) the point at which the percentage stimulation was the same for both X and Y. (1 mark)

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(ii) the optimum concentration of auxins required for part Y (1 mark)

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(d) State **three** ways in which the effects of auxins on plants is applied in flower farming. (3 marks)

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(e) Distinguish between simple and conditioned reflex action (3 marks)

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7. (a) Describe the mode of reproduction in a named fungus. (5 marks)

(b) Describe the role of hormones in the human menstrual cycle. (15 marks)

8. Describe what happens to a meal rich in proteins along the alimentary canal from ingestion to egestion. (20 marks)