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The Sign of Knowledge

NAME: …….. **INDEX NO: ……**

SCHOOL: ……..…… **DATE : ……..**

STUDENT'S SIGNATURE:…….

FORM 3 , 2020

231/2

BIOLOGY

PAPER 2

2 HOURS

Instructions

1. Write your name and admission number and school in the spaces provided above.
2. Answer ALL questions in Section A in the spaces provided.
3. In Section B answer Question 6 (Compulsory) and either question 7 or 8 in the spaces provided after question 8.

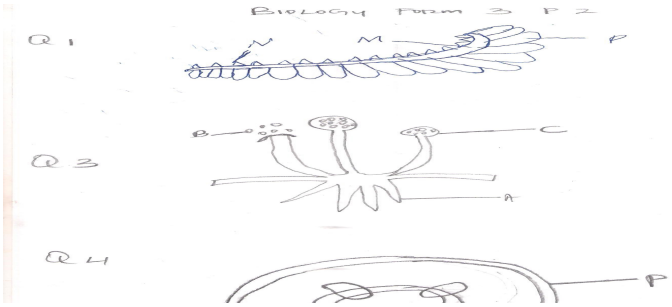
For Examiner's Use Only

Sections	Question	Max. Score	Candidate's Score
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
B	6	20	
	7	20	
	8	20	
Total Score		**80**	

SECTION A (40 Marks)

Answer ALL the Questions in this section in the spaces provided.

1. The diagram below represents an organ from a bony fish. Study it and answer the questions that follow:



a) Identify the organ. (1 Mark)

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b) Name the parts labeled M, N and P. (3 Marks)

M - ……..

N - ……..

P - ……..

c) How are the structures labeled P adapted to its function? (4 Marks)

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2. During an ecological study, students collected and marked 120 grasshoppers and released them. After 48 hours, the students captured another 90 grasshoppers, 20 of which had been marked previously.

a) Suggest a suitable equipment that might have been used to capture the grasshoppers.

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(1 Mark)

b) Estimate the size of the population of grasshoppers in the habitat. Show your workings.

(2 Marks)

c) What are the assumptions that are made when using the method? (3 Marks)

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d) State two other methods used in estimate population size of organisms in a habitat. (2 Marks)

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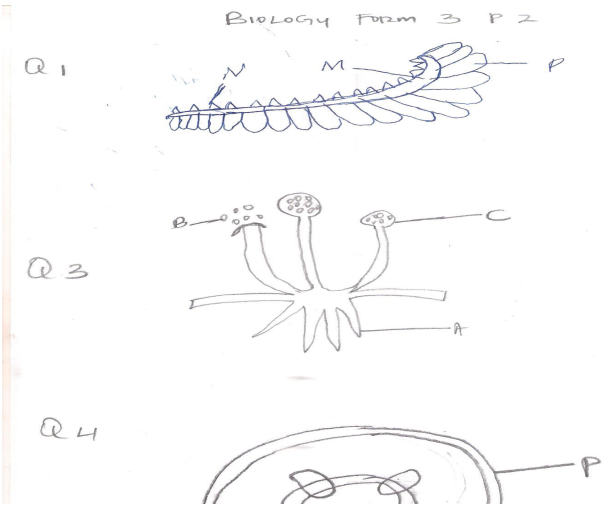
3. Study the diagram of the organism below and answer the question that follow.



a) Name the parts of the organism labeled A, B and C. (3 Marks)

A - ……..

B - ……..

C - ……..

b) State the kingdom to which this organism belong and give a reason. (2 Marks)

Kingdom : …….

Reason: …….

c) Name the mode of feeding displayed by the organism. (1 Mark)

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d) What roles does this organism play in its environment as regards its mode of feeding?
(2 Marks)

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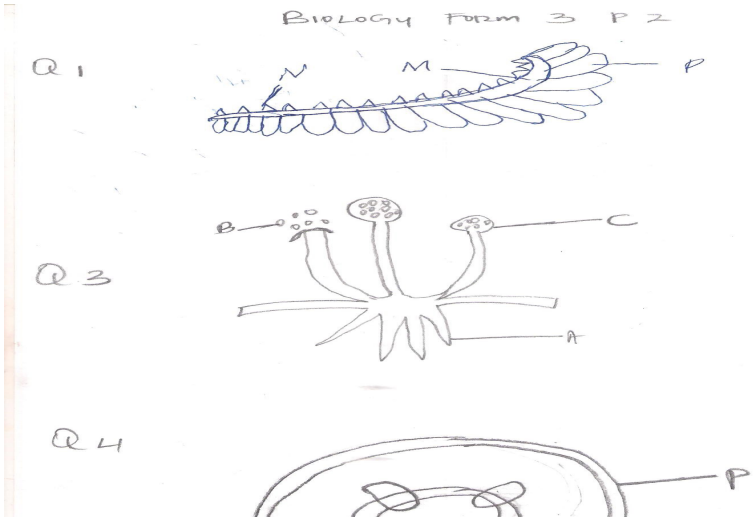
4. The diagram below represents a transverse section of a plant organ.



a) Name the part of plant from which the given section was obtained. (1 Mark)

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b) Give two reasons for your answer in (a) above. (2 Marks)

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c) Name the parts labeled P, Q and S. (3 Marks)

P - ……..

Q - ……..

S - ……..

d) State two functions of the part labeled R. (2 Marks)

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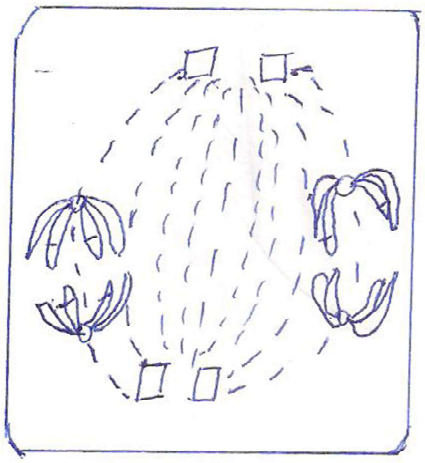
5. The diagram below represents a certain stage of a cell division.



a) Name the type of cell division shown by the diagram. (1 Mark)

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b) i) Name the stage of cell division that the diagram represents. Give a reason. (2 Marks)

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ii) In which organ in the animal body does the type of cell division occur? (1 Mark)

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iii) What is the significance of the type of cell division named in (a) above? (1 Mark)

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c) Write down three differences between the two types of cell division that occurs in organisms. (3 Marks)

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SECTION B (40 Marks)

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

6. An experiment was carried out to study the growth pattern of an insect. The mass of the insect was determined and recorded over a period of 14 weeks. The average mass of the insect was determined at regular interval since the first nymph appeared. The results obtained are as shown in the table below:

Table of Results

Time in Weeks	Mass in grams
0	6.5
1	9.0
2	11.5
3	11.5
4	18.0
5	25.0
6	25.0
7	25.0
8	31.5
9	37.0
10	37.0
11	37.0
12	40.5
13	45.0
14	45.0

a) Draw a graph of mass against time on the graph paper provided. (6 Marks)

b) What is the average mass of the insect in the 8 ½ week? (1 Mark)

c) i) Calculate the percentage growth rate between. (3 Marks)

(I) Week 3 and 5

(II) Week 7 and 9.

(III) Week 11 and 13.

ii) Account for the difference in growth rates observed in c(i) above. (2 Marks)

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d) Name the growth pattern exhibited by the insect. (1 Mark)

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e) What limits growth during or between week 2 and 3, 5 and 7 and as such? (1 Mark)

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f) i) Name the hormone that caused the changes observed after weeks 3, 8 and 12.

……(1 Mark)

ii) Which gland produces the hormone you named in f(i) above in insects. (1 Mark)

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g) Explain the type of metamorphosis that the insect in the study exhibits. (2 Marks)

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h) State why the pupal stage in insects is important. (2 Marks)

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i) State one importance of the larval stage in the life cycle of a butterfly. (1 Mark)

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7. Discuss the adaptations of the mammalian small intestines to its functions. (20 Marks)

8. Discuss how water and mineral salts move from the soil until they reach the leaves in a tall plant. (20 Marks)