Name ……. Index No ……..

Signature…….....Date……..……...

231/2
Biology Theory
Paper 2
January 2019
Time: 2 Hours

NABISTA JET 1

Biology Examinations

Kenya Certificate of Secondary Education (K.C.S.E) - 2019

Instructions to candidates

- Answer all questions in section A in the spaces after each question.
- In Section B answer questions 6 **(Compulsory)** and either question **7** or **8** in the spaces provided after question 8.
- Answer all the questions in the spaces provided.
- Candidates should answer all the questions in English.

For Examiners' 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	
	TOTAL SCORE	80	

This paper consists of 10 printed pages. Candidates should check the question paper to ensure that all the pages are printed as indicates and no questions are missing.

Section A: Answer all questions

1. Bile and pancreatic juice are important secretions in animal nutrition

a) In which part of the digestive system do they exert their influence? (1 mark)

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b) i). For efficient digestion, which of the two secretions should be mixed with chyme first?

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ii). Explain your answer above (2 marks)

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c) Explain why:

i). It is not necessary to eat too much protein in the diet (2 marks)

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ii). Liver is recommended in the diet of anaemic persons (2 marks)

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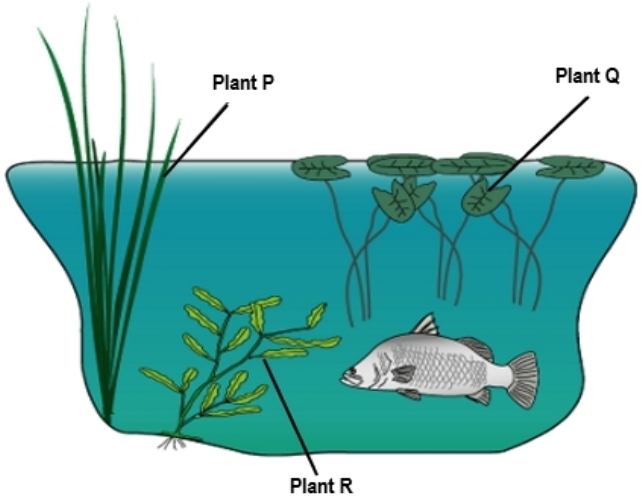
2. Below is a representation of an independent unit of the biosphere. Use it to answer the questions that follow



a) Identify the unit represented above (1 mark)

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b) i). Compare the primary productivity of the plants R and Q (1 mark)

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ii). Account for your answer above (2 marks)

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c) Give two differences between the chloroplasts of plants Q and R (2 marks)

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d) Name

i). The instrument that you can use to measure light penetration in the unit above (1 mark)

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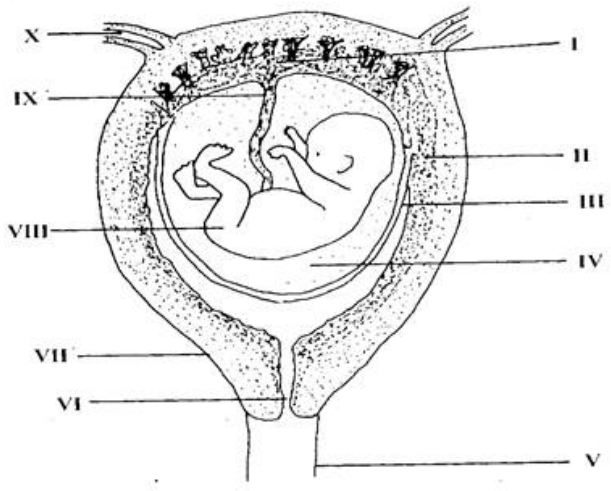
ii). The class to which the animal in the illustration belongs (1 mark)

……..

3. Study the diagram below and use it to answer the questions that follow



a) Name I, V and VII (3 marks)

I …….

V ……

VII …….

b) Briefly explain the role of:

VI (1 mark)

……

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VII in parturition (2 marks)

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c) Explain how dizygotic twins result (2 marks)

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4. Some aspects of the circulatory system were measured during a 50 minute period for an observed mammal. The table below show the recorded data. Study the data carefully and use it to answer the questions that follow.

Time (min)	**0**	**10**	**20**	**30**	**40**	**50**
Oxygen supply (arbitrary units)	12.3	12.3	16.1	16.1	16.0	12.3
Blood pH	6.9	6.9	6.5	6.4	6.7	6.9
Heart stroke volume (ml)	110	110	160	171	143	118

a) Comment on the state of the mammal at:

10 minutes (1 mark)

……..

20 minutes (1 mark)

……..

b) Account for;

i. The change in blood pH between 30 and 50 minutes (2 marks)

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ii. Change in heart stroke volume between 10 and 30 minutes (2 marks)

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iii. High oxygen supply at 40 minutes (2 marks)

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5. a). Define biodiversity (1 mark)

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b). During an ecological trip along the coastal strip, students of Marereni secondary School collected an organism that had two body parts and two body parts and two pairs of antennae.

i. Name the class to which this organism belonged (1 mark)

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ii. Predict the number of legs the organism most likely had (1 mark)

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iii. All the observed members of this species were found to hide under rocks and leaves. Suggest the benefits that this behavior confers to the organisms. (2 marks)

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c). Declining population of insects world wide should be a great concern to the human population. Explain (3 marks)

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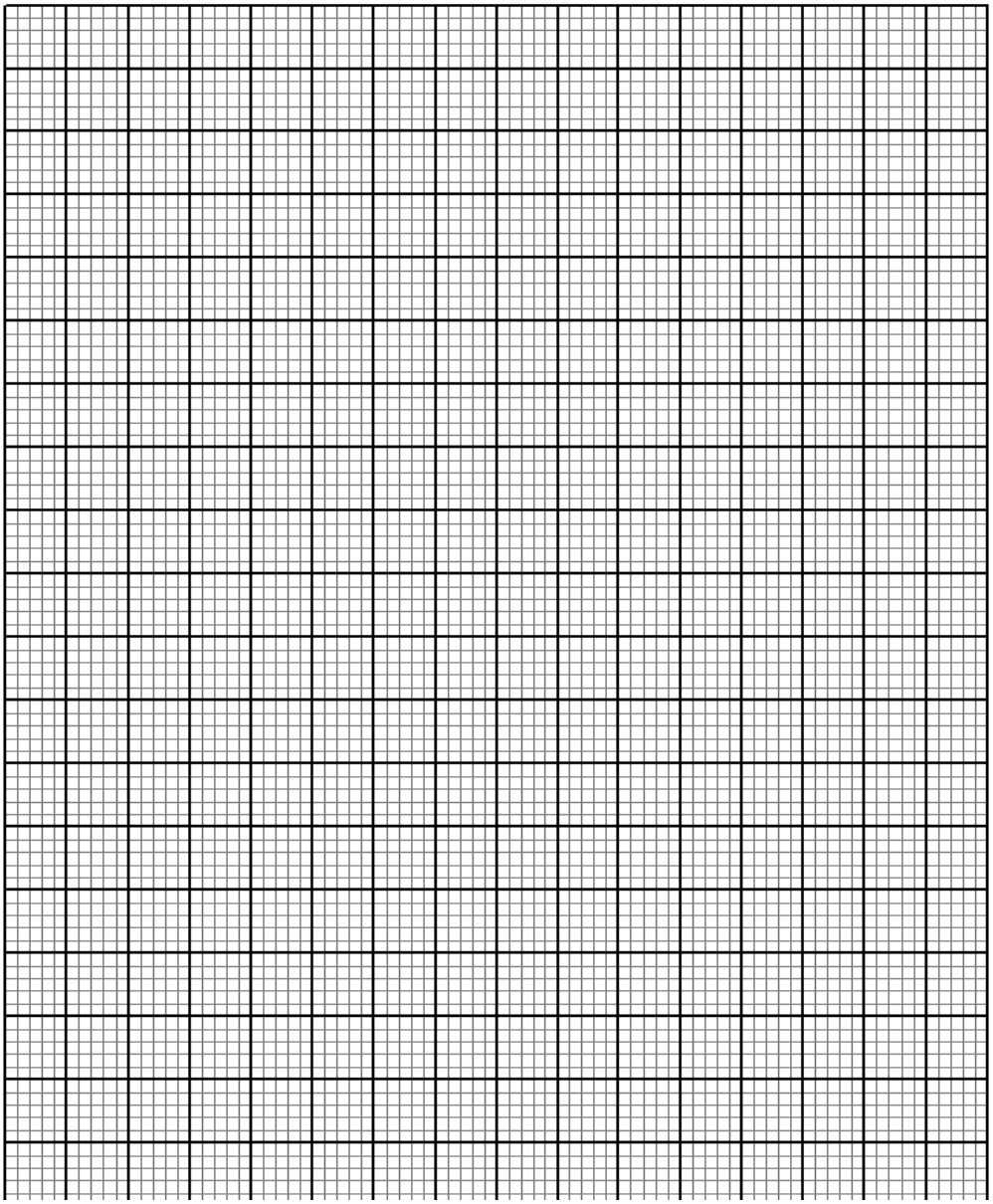
SECTION B: Answer question 6 and any other ONE question

6. Form one students of St. Josephine carried out an experiment to determine the percentage change in weight of two tender stems of two different plants when placed in two different sucrose solutions of different concentrations.

Sucrose concentration (mg/ml)	0	5	10	15	20	25	30	35
Percentage change in weight for plant N	7.0	6.6	5.0	3.6	1.6	-0.8	-2.3	-2.8
Percentage change in weight for plant D	3.2	2.2	0.8	-0.6	-1.4	-2.2	-2.8	-3.4

a) On the same axes, in the graph provided below, plot a graph of percentage weight change of the plant stem tissues against sucrose concentration (8 marks)



b) Account for the results obtained for the plant tissues at 15 mg/ml sucrose concentration (2 marks)

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c) From the graph, determine the concentrations of the cells saps of the two plants

Plant N (1 mark)

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Plant D (1 mark)

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d) i). Identify the plant that was most likely obtained from a more saline environment?

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ii). Explain your answer above (2 marks)

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e) Describe the effect of high osmotic pressure of body fluids on urine formation (5 marks)

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7. a). Discuss the practical applications of auxins and gibberellins in agriculture (10 marks)

b). Discuss the role of living organisms in the nitrogen cycle (10 marks)

8. Describe the structural adaptations of the mammalian heart (20 marks)