Name……..……... **Index. No**……

Signature……..... **Date**……

231/2
Biology Theory
Paper 2
May/June 2019
Time: 2 Hours

NABISTA JET 5

Biology Examinations
Kenya Certificate of Secondary Education (K.C.S.E) – 2019

Instructions To Candidates

1. Answer **all** the questions in section **A** in the spaces provided after each question.
2. In section **B** answer question **6 (compulsory)** and either question **7** or **8** in the spaces provided after question 8.
3. Candidates should answer the questions in correct 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	
	7	20	
	8	20	
Total Score	**80**		

SECTION A (40 marks)

1. (a) Study the organisms below and answer the questions that follow.



Organism A



Organism B

Giving a reason in each case, identify classes in which each of the organisms belong.

Organism A ..... (1 mark)

Reason (1 mark)

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Organism B ..... (1 mark)

Reason (1 mark)

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b) State **three** properties of a cell membrane. (3 marks)

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(iii) State **one** function of a cell sap in a cell. (1 mark)

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2. Study the table below and answer the questions that follow. Organisms A and B are of the same size.

Food substrate	Organism A	Organism B
	Amount of Energy produced in KJ/Mole	Amount of Energy produced in KJ/Mole
Carbohydrates	2898	211
Fats	6478	375
Proteins	3750	222

a) Name the process that is responsible for the energy production in organism A. (1mark)

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b) Account for the energy production in organisms A and B. (2 marks)

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c) State **two** reasons why fats are not the main food substrate in organism A. (2 marks)

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d) Explain how age affects energy production in organism **A**. (2 marks)

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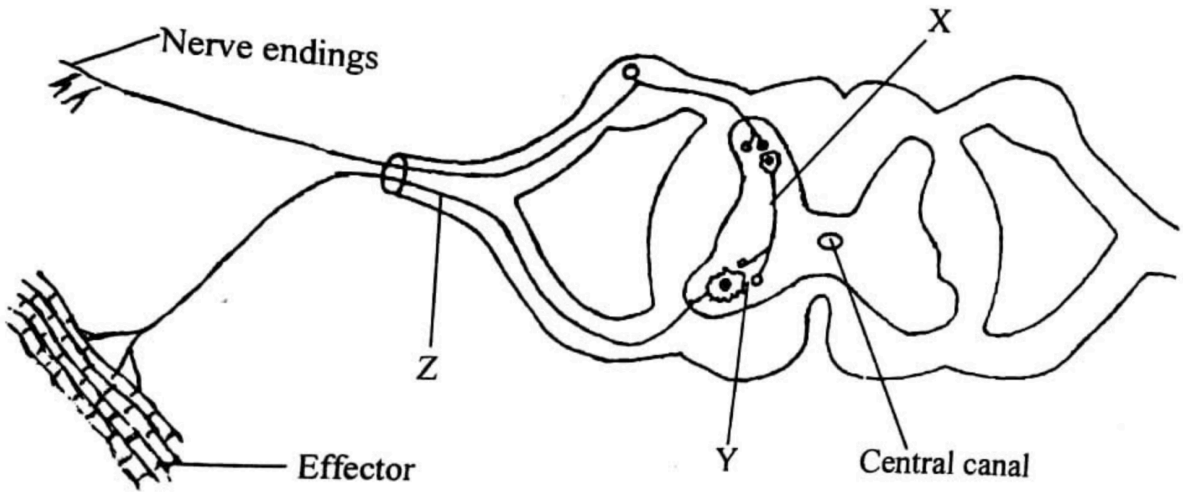
e) State **one** economic importance of the process that occurs in organism B (1 mark)

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3. a) The diagram below represents a simple reflex arc in human.



(i) Name the neurone labeled X. (1 mark)

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(ii) Explain how a nerve impulse is bridged across the gap Y (3 marks)

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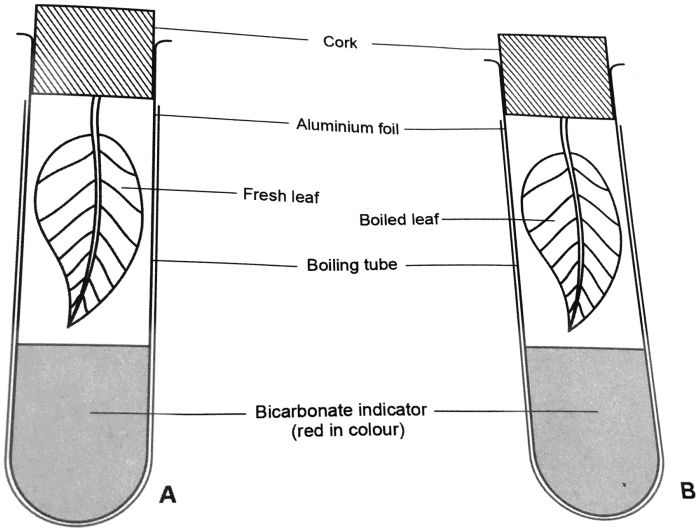
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b) Fill the table below with a tick where there is blood type compatibility and an X where there is lack of blood type compatibility during a transfusion. (4 marks)

	Recipient		
Donor		**O**	**B**
	A		
	AB		

4. The below set ups were used to investigate gaseous exchange. Study them and answer the questions that follow.



a) State the expected result in boiling tube B. (1 mark)

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b) State and account for the result obtained in boiling tube A. (3 marks)

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c) Describe the mechanism of inhalation in human being. (4 marks)

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5. A red cow was mated with a white bull. All F1 offsprings were neither red nor white.

Such individuals are said to be roan.

(a) Using letter R to represent the gene for red colour and W for the gene for white colour. Work out the genotypes of the F1 offsprings. (4 marks)

(b) If the F1 offspring were selfed, state the phenotypic and genotypic ratios of the F2 offsprings. (2 marks)

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(c) State **two** structural differences between DNA and RNA. (2 marks)

DNA	RNA

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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. In an experiment to determine the effect of food quality on growth, a group of ten young rats kept at 28^0C were weighed weekly for seven weeks. The results were as shown in the table below. The average weights are expressed in grams.

Food used	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Milk powder	26	32.9	36.4	40.2	43.4	45.5	47.7
Wheat bran	26	31.7	34.6	36.0	37.0	39.1	40.5
Cassava chips	26	27.5	28.3	29.0	29.5	30.0	30.2
Milk powder and wheat bran	26	43.5	50.1	63.4	70.8	78.2	84.0
Milk powder and cassava chips	26	38.1	46.2	53.8	58.6	62.6	66.1

a) Which food and between which two weeks did the greatest increase in weight occur.

Food ..... (1 mark)

Weeks ..... (1 mark)

b) (i) Which of the five foods gave the lowest growth rate? (1 mark)

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

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c) Between week 6 and 7, the average increase in weight in rats was low. Explain this observation. (2 marks)

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c) With a reason, suggest how the change in average weight in rats would have been at week nine if the experiment were continued. (3 marks)

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d) Why were ten rats used in each group instead of one rat? (2 marks)

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e) What difference would be expected between the data above and data that would be obtained if the rats were kept at 10^0C? Give a reason for your answer. (3 marks)

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f) Describe how the average weight of rats was determined. (3 marks)

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g) Apart from food, state two other factors that could have led to increase in growth rate in the rats. (2 marks)

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7. (a) How are the flowers adapted to the following agents of pollination

i) Wind. (5 marks)

ii) Insects (5 marks)

b) Discuss the mechanisms developed by plants that encourage

i) Self-pollination (4 marks)

ii) Cross pollination. (6 marks)

8. a) State two functions of the mammalian ear. (2 marks)

b) Describe the process of hearing in man. (14 marks)

c) Explain the effect of temperature on the rate of photosynthesis. (4 marks)

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