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ADM No.....

School.....

Candidate signature.....

Date.....

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

### SCHOOLBASED FORM IV JULY/AUGUST 2017 EXAMINATION

#### INSTRUCTIONS TO CANDIDATES:-

- Write your **name** and **adnumber** in the spaces provided above.
- This paper consists of **two** sections; **A** and **B**.
- Answer **all** the questions in Section **A** in the spaces provided.
- 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:

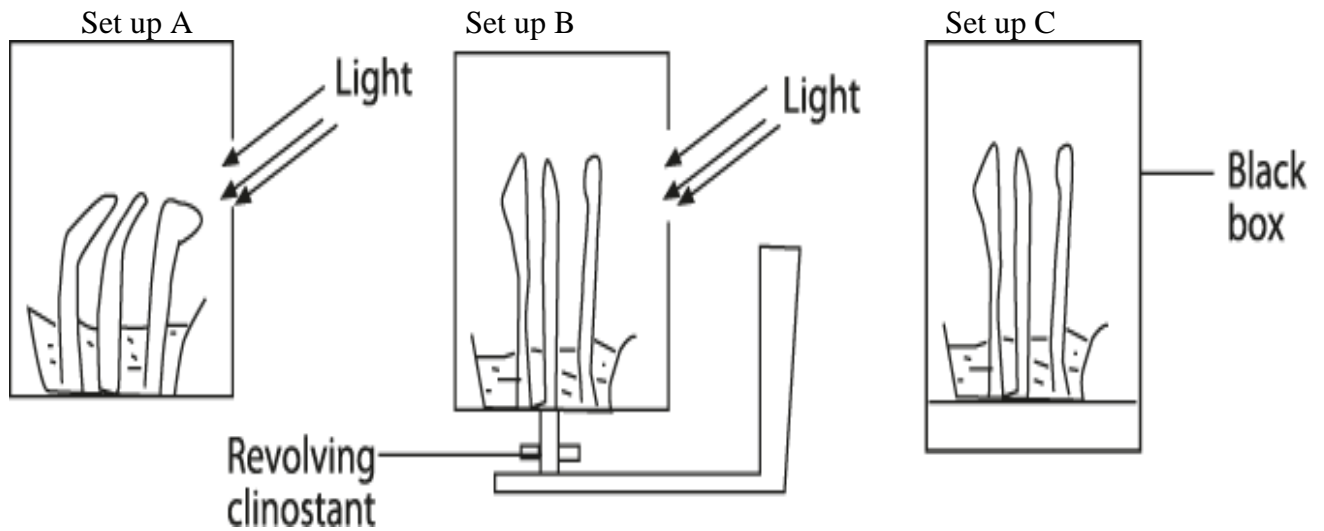
Section	Question	Maximum score	Candidates score
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
B	6	20	
	7 or	20	
	8	20	
<b>TOTAL SCORE</b>		<b>80</b>	

*This paper consists of 10 printed pages. Candidates should check to ascertain that all the pages are printed as indicated and that no questions are missing.*

**SECTION A (40 Marks)**

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

1. A form 4 class set up an experiment as shown in the diagram below. All the three set ups had growing maize seedlings in a box. Study the set up and answer the question that follows;



(a) Suggest the aim of the experiment. (1mk)

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b) i) Account for the result shown in the set up A. (2mks)

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ii) What was the purpose of the revolving clinostat in set up B. (1mk)

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c) i) Name the phenomenon exhibited by set up C results. (1mk)

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ii) What is the significance of the phenomenon named in C (i) above. (1mk)

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d) Differentiate between conditioned and simple reflex action. (2mks)

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2. a) What are the multiple alleles? (1mk)

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b) A pure black male mouse was mated with a pure breeding brown female mouse. All the offspring had black coat colour.

i) Explain the appearance of black coat colour in the offsprings. (1mk)

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ii) If the black parent mouse was mated with a mouse that is heterozygous for coat colour, work out the genotypic ratio of offspring. Show your working. (4mks)

iii) State two disorders in human being that are as a result of chromosomal mutation. (2mks)

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3 In an attempt to estimate the number of weaver birds in a small woodland 435 were captured marked and released. Three days later 620 were captured 95 of which were marked.

a) What is the name of the sampling method described above? (1mk)

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b) Calculate the approximate size of the weaver bird population in the woodland. (2mks)

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c) What two assumptions must be made during this investigation. (2mks)

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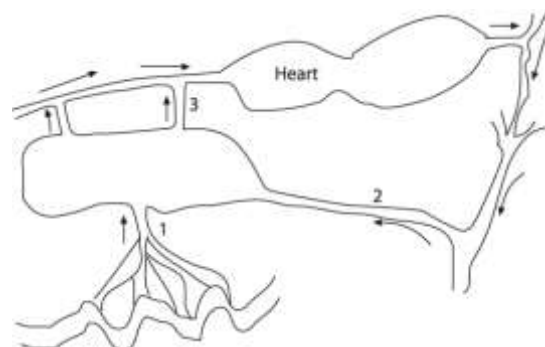
d) List three other methods that can be used to estimate the number of organisms in a given habitat. (3mks)

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4. The figure below is a simplified diagram of a mammalian circulatory system. Study it and answer the question that follows;



a) Explain why the level of blood sugar in vessel 3 would be higher than that in vessel 1 during fasting (2mks)

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b) Name the vessel that has the highest concentration of urea among vessels labeled 1, 2, and 3 (1mk)

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c) In what way does blood vessel 1 differ from most of the other blood vessel in the body? (1mk)

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d) Name three nutrients that are only transported in vessels 1 following absorption. (3mks)

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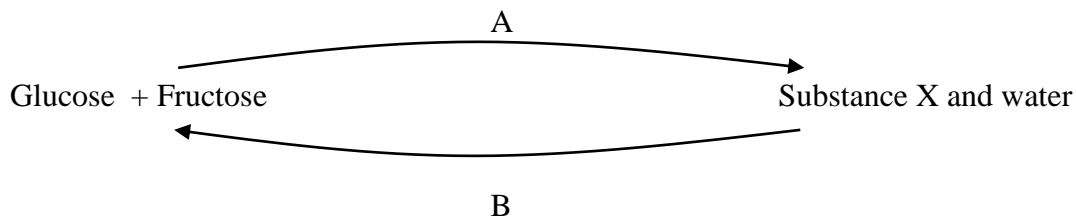
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e) Why is it necessary that blood from digestive tract pass through the liver before entering the general circulation? (1mk)

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5 a) Study the diagram below and answer the questions that follows;



i) Name the identity of process B (1mk)

ii) Which part of the mammalian body does process B occur? (1mk)

iii) Give the identity of substance X (1mk)

iv) Name the enzyme involved in process B (1mk)

b) Briefly describe the light stage of photosynthesis. (4mks)

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**SECTION B (40marks)**

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

6. A man carried out an experiment to find out the effect of water and 0.9% salt solution on urine production. On the first day, he drunk one litre of water (x). On the second day, he repeated the experiment, but instead of water, he drunk one litre of 0.9% salt solution (Y).

The experimental results are shown in the table below.

Time in (hrs)		0.0	1.0	1.5	2.5	4.5	5.5	6.5	7.5
Amount of Urine produced In cm <sup>3</sup> per hour	x	80	60	360	520	60	100	40	60
	Y	40	40	40	45	100	60	80	100

- a) Using a suitable scale draw graphs of urine produced in cm<sup>3</sup> per hour against time. (8mks)
- b) From the graph determine the;
  - i) Amount of urine produced in the second hour when the man had drunk solution X. (1mk)

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- ii) The rate of urine production between the first and second hour after the man had drunk one litre of water. Show your working. (2mks)

- c) What does the shape of the curve representing column X tell us about the rate of urine production? (2mks)

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- d) Explain the differences between the rate of production in graph X and Y. (2mks)

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- e) Why do you think drinking one litre (0.9%) of sodium chloride solution made little difference to the output? (1 mk)

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- f) Name two hormones involved in regulation of osmotic pressure in kidney. (2mks)

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