Name: ……. Index no: ……

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Date: …….....

231/2
BIOLOGY
PAPER 2 (THEORY)
FORM 4
TIME: 2 HOURS

Kenya Certificate of Secondary Education
END OF TERM EXAMINATION

SECTION A (40 MARKS)
Answer all questions in this section in the spaces provided.

1. (a) Name **two** disorders in human caused by gene mutation. (2 marks)

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(b) Describe the following chromosomal mutations:

(i) Inversion (1 marks)

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(ii) Translocation (1 marks)

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(c) In mice the allele for **black fur** is **dominant** to the allele for **brown fur**. What Percentage of offspring would have brown fur from a cross between heterozygous black mice? Show working. Use letter **B** to represent the allele for **black colour**. (4 marks)

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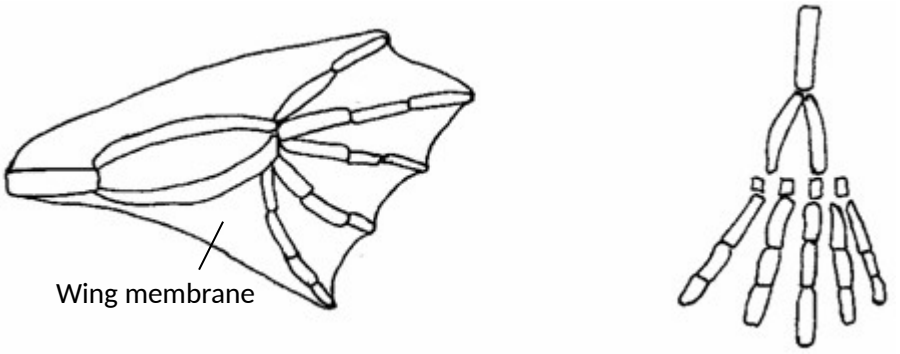
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2. The diagram **below** shows structures of the bat wing and human arm.



(a)These structures are thought to have same ancestral origin. State **one** structural similarity and **one** adaptational difference between the two.

(i) Structural similarity. (1mk)

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(ii) Adaptation difference. (2mks)

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(b)Give **two** other examples of structures in nature that show the type of evolution as in (a) above. (2mks)

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(c)Distinguish between the terms 'chemical evolution' and 'organic evolution'. (2mks)

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(d) What is the study of fossils called? (1mk)

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3 a) Name the causative agents for the following respiratory diseases.

i) Whooping cough…… (1 mark)

ii) Pneumonia…….(1 mark)

b) Describe how carbon (IV) oxide in the tissues reaches the lungs (4 marks)

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c) How are guard cells adapted to their functions? 2mks

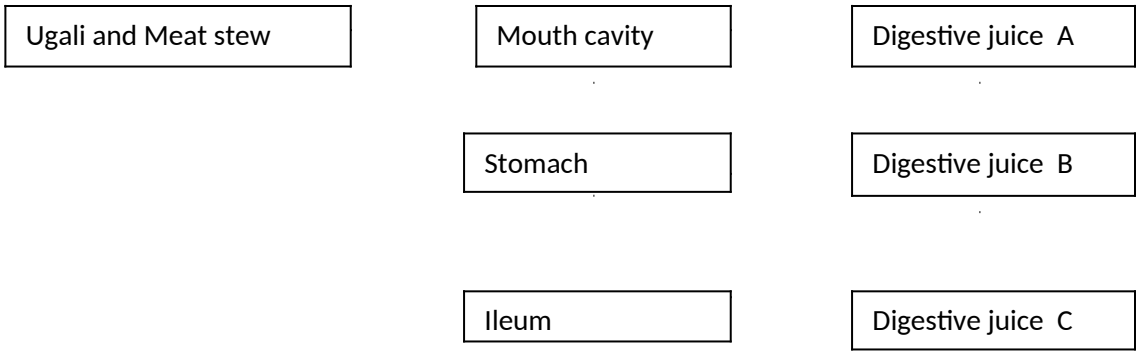
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4.The flow diagram below represents passage of a meal through the human digestive system. Study the diagram and answer the questions that follow.



(a) Name the physical process that will occur in mouth cavity *(1mark)*

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(b) Name the digestive juices **B** and **C** *(2 marks)*

B……

C……

(c) Explain **two** ways in which the digestive system is protected from corrosive effects of digestive juices. *(2 marks)*

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(d) Name the hormone that stimulate secretion of juice **B**. *(1mark)*

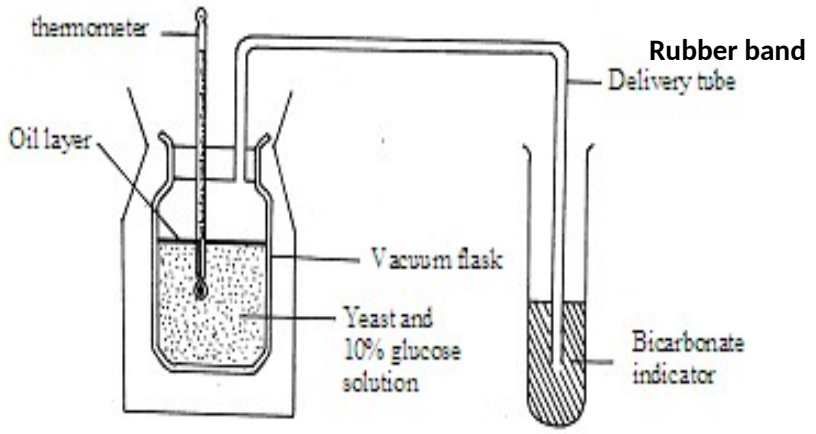
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(e) Identify **two** contents of digestive juice **A** *(2 marks)*

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5. The experiment below was set-up to investigate some physiological processes. The glucose solution was first boiled then cooled. The set-up was left for 24hrs.



(a) Suggest two aims of the experiment. (2mks)

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(b)(i) State the expected observations after 24 hours. (2mks)

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(ii) Explain your observations in a (i) above. (2mk)

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(iii) Why was glucose solution boiled then cooled? (1mk)

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(iii) Suggest a control for the above experiment (1mk)

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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. In an experiment, a man drank one litre of water and the volume of urine produced was measured and recorded at an interval of one hour after drinking the water. On the second day, the man repeated the experiment but this time he drank one litre of 1.2% sodium chloride solution. The results are as shown in the table below:

Time (hours)	Volume of urine produced (cm^3) on drinking	
	Water	1.2 % sodium chloride solution
0	80	30
1	50	30
2	350	40
3	540	35
4	30	60
5	100	40
6	50	80
7	70	100

(a) On the same axes, plot graphs of urine produced on drinking water and 1.2%sodium chloride solution against time. (8 marks)

(b) From the graph, determine the volume of urine produced by the man two and a half hours after drinking water. (1 mark)

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(c) Account for the production of urine produced by the man when he drank the litre of

(i) 1.2% sodium chloride solution. (3 marks)

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(ii) Water (3marks)

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(d) What is diabetes insipidus? (2 marks)

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(e) Explain why treatment of diabetes mellitus is via injection and not through taking insulin tablets orally. (2 marks)

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7. . Explain how abiotic factors affect plants in their habitat. (20 marks)

8.Describe the structure and function of various parts of the heart *(20 marks)*

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