

NAME ..... INDEX NO .....

SCHOOL ..... DATE .....

CANDIDATE'S SIGNATURE .....

231/2

**BIOLOGY**

**PAPER 2**

**FORM 4**

**JULY 2017**

**TIME: 2 HOURS**

**Kenya Certificate of Secondary Education**

## **END OF TERM II EXAMINATION QUESTIONS**

1. In human beings, baldness is controlled by a dominant gene N located on the Y chromosome

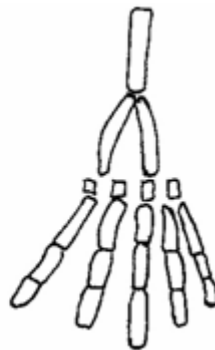
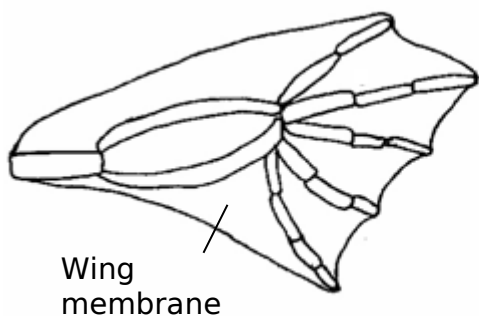
a) Work out a cross between a bald headed man and his wife (4mks)

b) i) What is the probability of the couple getting girls who would develop baldness (1mrk)

i) Give a reason for your answer in b i) above. (1mk)

c.) Apart from the above trait name **two** other sex linked traits in human beings associated with Y chromosome. (2mks)

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)

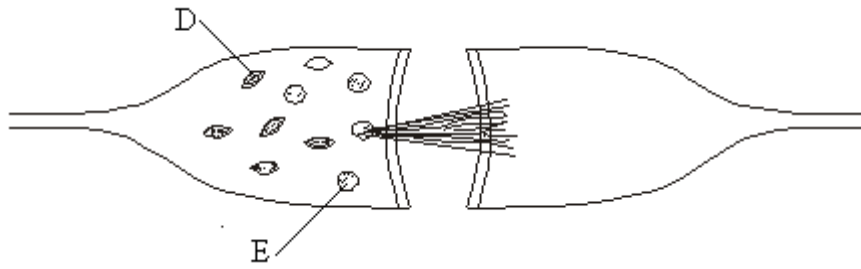
(ii) Adaptation difference. (2mks)

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

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

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

3. The diagram below shows a synapse.



a) Indicate the direction of the impulse on the diagram. (1 mark)

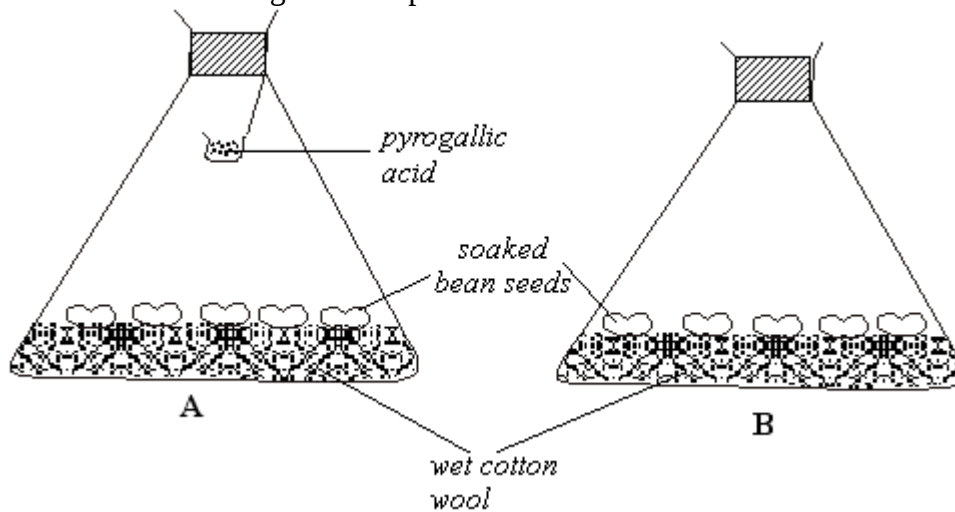
b) Label D and E (2 marks)

c) Compare a simple reflex action with a conditioned reflex action. (3 marks)

Simple reflex	Conditioned reflex

d) State two functions of hormones in animals. (2 marks)

4. Science club members designed an experiment as shown below. Examine it.



The set up was kept at room temperature for one week.

(a) What was the aim of the experiment? (1mark)

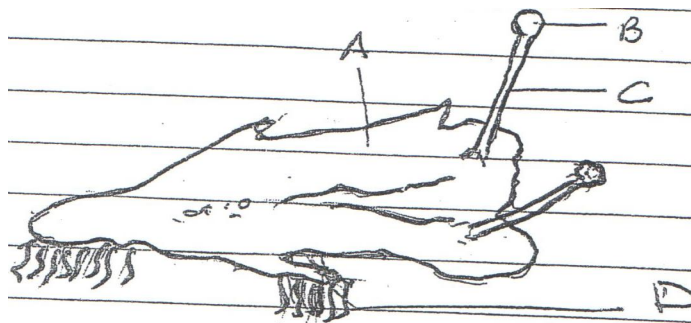
(b) What observation was made after one week.in A and B (2marks)

(c) (i) Explain the role of water in seed germination. (3marks)

d.) What was the role of pyrogallic acid in the above set up? (1mk)

e.) Name one internal factor necessary for seed germination (1mk)

5. The diagram below represents a certain organism observed by a student in an ecological tour.



a) Name the parts labeled A and C (2mks)

b) Name the division to which the organism belongs (1mk)

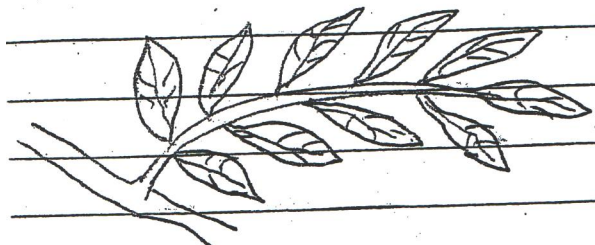
c) Give two observable reasons for your answer in (b) above (2mks)

d) Define the following terms (1mk)

i) Taxa

ii) Binomial nomenclature (1mk)

e) Give the name of the following leaf form observed in plants (1mk)



**SECTION B.**

6. An experiment was carried out to investigate the effect of temperature on the rate of reaction catalyzed by an enzyme. The results are shown in the table below

Temperature ( $^{\circ}\text{C}$ )	Rate of reaction in mg of products per unit time
5	0.2
10	0.5
15	0.8
20	1.1
25	1.5
30	2.1
35	3.0
40	3.7
45	3.4
50	2.8
55	2.1

60	1.1
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a). On the grid provided draw a graph of rate of reaction against temperature ( 6 mks)  
b). When was the rate of reaction 2.6 mg of product per unit time? ( 2 mks)

(c) Account for the shape of the graph between

(i) 5<sup>o</sup> C and 40<sup>o</sup> C ( 2 mks)

(ii) 45<sup>o</sup> C and 60<sup>o</sup>C ( 3 mks)

(d) Other than temperature name two ways in which the rate of reaction between 5<sup>o</sup>C and 40<sup>o</sup>C could be increased ( 2 mks)

(e) (i) Name one digestive enzymes in the human body which works best in acidic condition

( 1 mk)

(ii) How is the acidic condition for the enzyme named in (e) (i) above attained? ( 2 mks)

(f) The acidic conditions in (e) (ii) above is later neutralized

(i) Where does the neutralization take place?

(1mk)

ii) Name the substance responsible for neutralization

( 1 mk)

7. Explain the role of human skin in:

a) Thermo- regulation.

(14mks)

b) Protection

(6mks)

8. (a) State the structural adaptation of the insects tracheal system

(10 marks)