**Name ……..…… Class ……. Index No. ……/……..**

**231/2** **Candidate's Signature ……..……..……..……...**
**BIOLOGY**
**Paper 2** **Date ……...……..**
**(Theory)**
**June/ July, 2014**
**2 hours**

# Kenya Certificate of Secondary Education
# SUBUKIA SUB-COUNTY JOINT EXAMINATIONS-2014

***Instructions to candidates***

***(a)*** *Write your name, class and index number in the spaces provided above.*
***(b)*** *Sign and write the date of examination in the spaces provided above.*
***(c)*** *This paper consists of* ***two*** *sections:* ***A*** *and* ***B****.*
***(d)*** *Answer* ***ALL*** *the questions in section* ***A*** *in the spaces provided.*
***(e)*** *In section* ***B*** *answer* ***question 7 (compulsory)*** *and* ***either question 8 OR question 9*** *in the spaces provided after question* ***9***

**For Examiner's Use Only**

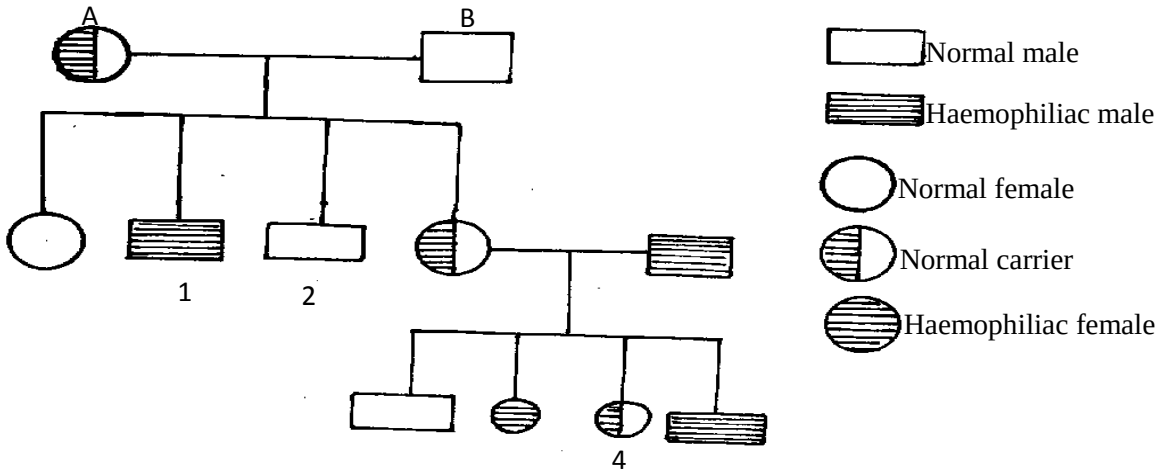
| Section | Question | Maximum Score | Candidate's Score |
|---|---|---|---|
| A | 1 | 8 | |
| | 2 | 8 | |
| | 3 | 8 | |
| | 4 | 8 | |
| | 5 | 8 | |
| B | 6 | 20 | |
| | 7/8 | 20 | |
| Total Score | | 80 | |

**This paper consists of 11printed pages.**
**Candidates should check the question paper to ascertain that**
all the pages are printed as indicated and no questions are missing

**Section A (40 Marks)**

***Answer all questions in this section.***

1. The hemophilia is an X- linked recessive condition. The following pedigree shows a portion of a family in which members have hemophilia. Use H for non-hemophilia h for hemophilia.




(a) Identify the genotypes of parents A and B.

A……. (1mk)

B……. (1mk)

(b) What is the genotype of offspring number 1 (1mk)

……

……

(b) A carrier woman marries a hemophiliac man. What is the probability that the couple will have a son who is hemophiliac show your working. (4mks)

……
……
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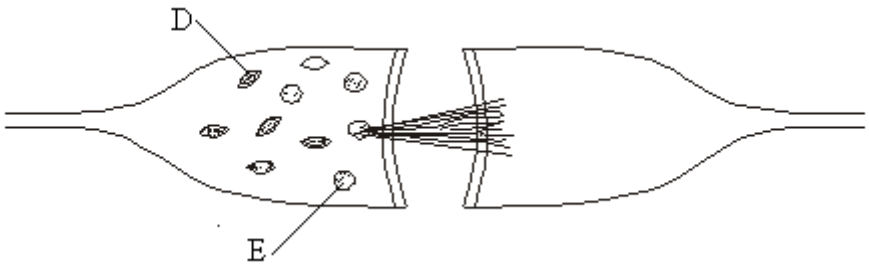
……

(c) Name one defect of non-disjunction chromosomal mutation (1mk)

……

2. 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)

**D**

……...

E

……

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

……

……

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

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3. The results in the table below show the effect of some conditions on seed germination. In each experiment, all the other environmental conditions were kept constant except the one being investigated.

| Experiment | Treatment | Percentage germination |
|---|---|---|
| 1 | Seeds placed in tightly closed container with pyrogallic acid | 0 |
| II | i)Seeds kept on saucer in light<br>ii)Seeds kept on saucer in darkness | 96<br>97 |
| III | i)Seeds kept in a refrigerator at $40^0$C<br>ii)Seeds kept in an oven at $60^o$C<br>iii)Seeds kept at 35oC | 0.5<br>0<br>92 |
| IV | i)Dry Seeds in closed container<br>ii)Moist seeds in closed container | 0<br>87 |

a) (i) What was the role of pyrogallic acid in experiment **I** (1mark)

……

……

ii) State the aim of experiment **II** (Imark)

……

……

b) (i) Account for the results obtained in experiment set up **III** (3mks)

……

……

(c) Name the conditions necessary for germination being investigated by experiment **I, III** and **IV** (3mks)

**I**

……

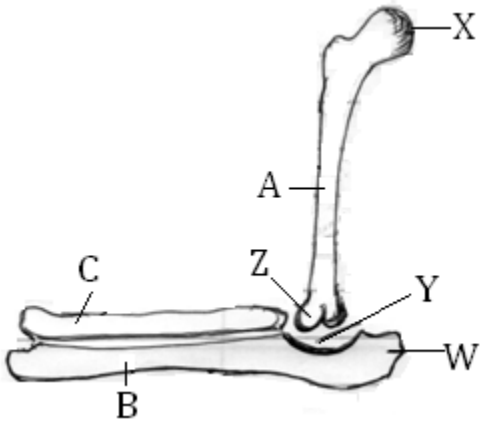
**III**

……

**IV**

……

4. The figure below represents the fore limb of a mammal.




(a) Name bone **A, B** and **C** (3marks)

**A**

……

**B**

……

**C**

……..

(b) i) Name the Bone with which part **X** articulates. (2marks)

……

……...

ii) Name the joint formed by bone **A at** point **X** and the bone mentioned in **(b) (i)** above .(1 Mk)

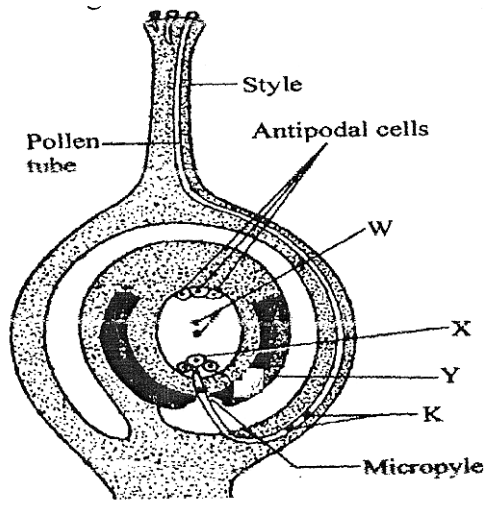
(c) Name the type of joint that is formed by bone **A** and **B** (1mark)

……

(v) State the structure formed by fused caudal vertebrae in a human. (1mark)

……

5. The diagram below shows a cross section through the female part of a flower.




a.) Name the structures labeled W, X and Y. (3mks)

X:……

Y:……

Z:……

b.) State ***one*** function of the pollen tube. (1mk)

……

……..

c).What happens to antipodal cells after fertilization? (1mk)

……

……

d.)What does semi-permeable membrane represent in an animal cell (1mk)

……

……

e). (i) Name the structure labeled **K**. (1mk)

……

(ii) State the role played by the structure named in **e (i)** above. (1 mk)

……

## *SECTIION B (40Marks)*

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

6. In an ecological study, a glass hopper population and that of a crows was estimated in a certain grassland area over a period of one year. The results are as shown in the table below.

| Month | J | F | M | A | M | J | J | A | S | O | N | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number of adult grasshoppers × $10^2$ | 90 | 20 | 11 | 25 | 2500 | 1652 | 120 | 15 | 10 | 35 | 195 | 456 |
| Number of crows | 4 | 2 | 1 | 1 | 8 | 22 | 7 | 2 | 1 | 1 | 5 | 15 |
| Amount of rainfall | 20 | 0 | 320 | 350 | 520 | 350 | 12 | 10 | 25 | 190 | 256 | 350 |

(a) (i) What is the relationship between the rainfall and grasshopper population? (1mk)

……

……

(ii) Account for the relationship stated in a **(i)** above. (3mks)

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(b) Explain the relationship between the grasshopper population and that of the crows. (3 mks)

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……....

(c) If the data was used in the construction of pyramid of numbers, what would be the trophic level of; (3mks)

1. **Grasshopper**

   ……..

2. **Crows**

   ……..

3. **The grass in the study area**

   ……..

(d) If the area studied was one square kilometer, state;

(i) One method that could have been used to estimate the crow population. (1 mk)

……..

(ii) One method that could have been used to estimate the grasshopper population. (1 mk)

……

(e) Suggest what would happen if a predator for grasshoppers entered the study area. (2 mks)

……

……

(f) What is meant by the term carrying capacity? (1mk)

……

……

(g) Why would the carrying capacity of wild animals in woodland grassland be higher than that of cattle? (2mks)

……

……

(h) What is an ecosystem? (3mks)

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7.(a).Describe how the mammalian heart is adapted to its function (10marks)

(b)Describe how gaseous exchange takes place in terrestrial plants. (10marks)

8. (a) Explain why plants lack elaborate excretory organs like those found in animals. (3mks)

(b) Name five methods of excretion in plants. (5mks)

(c) State any six excretory products in plants and give economic uses. (12mks)

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**ANSWERS:**

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