

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

CANDIDATE'S SIGN..... DATE.....

**LAIKIPIA EAST TERM 2 2022 FORM 4 EVALUATION EXAM  
Kenya Certificate of Secondary Education (K.C.S.E)**

231/2

**BIOLOGY**

**PAPER 2**

**THEORY**

**TIME: 2 HOURS**

**INSTRUCTIONS TO CANDIDATES.**

- 1) Write **your name** and **index number** in the spaces provided above.
- 2) Sign and write the date of examination in the spaces provided above.
- 3) This paper consists of section **A** and **B**.
- 4) Answer **ALL** questions in section A in the spaces provided.
- 5) In section **B** answer questions 6 (compulsory) and either question 7 or 8 in the spaces provided after question 8.

**FOR EXAMINERS' USE ONLY.**

SECTION	QUESTIONS	MAXIMUM SCORE	CANDIDATES SCORE
<b>A</b>	<b>1</b>	<b>8</b>	
	<b>2</b>	<b>8</b>	
	<b>3</b>	<b>8</b>	
	<b>4</b>	<b>8</b>	
	<b>5</b>	<b>8</b>	
<b>B</b>	<b>6</b>	<b>20</b>	
	<b>7</b>	<b>20</b>	
	<b>8</b>	<b>20</b>	
	<b>TOTAL</b>	<b>80</b>	

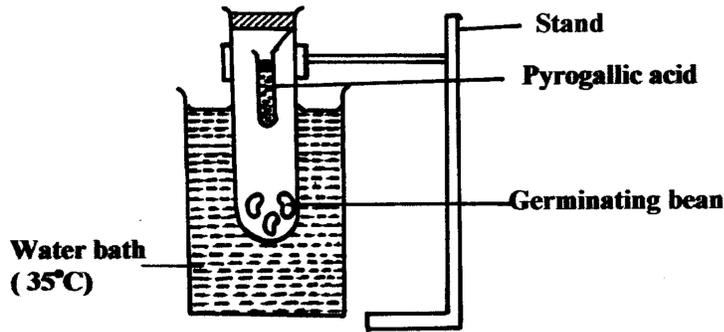
*This paper consists of 9 printed pages.*

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

**SECTION A (40MARKS)**

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

1 The diagram below shows a set up to investigate a factor necessary for germination.



a) Name the factor under investigation. (1mk)

.....  
.....

b) State the role of pyrogallic acid in the set up. (1mk)

.....  
.....

c) Which type of respiration is taking place in the beans? (1mk)

.....  
.....

d) Write a word equation for the process named in (c) above. (1mk)

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.....

e) Explain why plants can only carry out the above respiration process for a short while. (1mk)

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.....

f) State other **three** factors necessary for germination. (3mks)

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.....  
.....

2. Study photographs shown below then answer the questions.



**Q1**



**R1**

**R**



**S1**

**S**

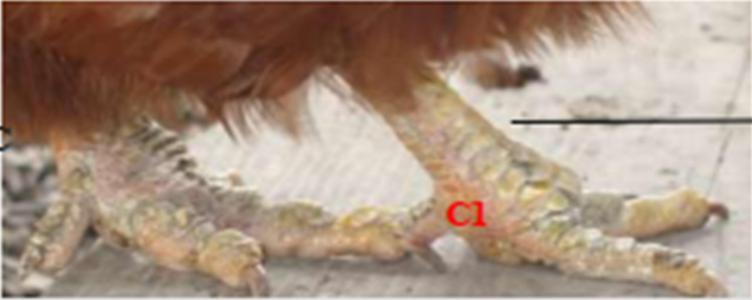


**A1**



**B1**

**B**



**M**

**C1**

a) State the type of evolution represented by structures **O1**, **R1** and **S1**. (1mk)

.....  
b) Explain the type of evolution identified in (a) above. (1mk)

.....  
(c) Give the evolution term used to describe structures;  
(i) **Q1, R1 and S1.** (1mk)

.....  
(ii) **A1, B1 and C1.** (1mk)

.....  
d). What type of evolution is illustrated by the limbs (**A1, B1 and C1**)? (1mk)

.....  
e). (i) Name classes for organisms labeled **Q, R and S.** (3mks)

.....  
f) (i) Suggest the diet of animal **R.**

**R.**..... (1mk)

g) Give a reason for placing **S** in the class named in e (i) above. (1mk)

.....  
.....  
3 a) What is internal fertilization? (1mk)

.....  
.....  
b) Suggest two disadvantages of internal fertilization in most mammals. (2mks)

.....  
.....  
c) State two roles of placenta in mammals. (2mks)

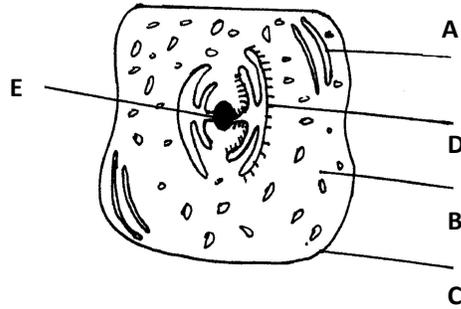
.....  
.....  
d) Mention one role played by each of the following hormones in human menstrual cycle. (3mks)

i) Oestrogen

.....  
ii) Luteinizing hormone

.....  
iii) Follicle stimulating hormone

4. Below is a cell obtained from living organisms. Study it and answer the questions that follow



(a) From which kingdom of organism was the cell obtained? (1mk)

.....

(b) Give **two** reasons for your answer in 4 (a) above: (2mks)

(i).....

(ii).....

(c) On the diagram identify parts **A, B** and **C**. (3mks)

.....  
 .....  
 .....

(d) State the role of parts **D** and **E**. (2mks)

**D**:.....

**E**:.....

5 a) What are alleles? (1mk)

.....  
 .....

b). Haemophilia is a genetic condition transmitted through a recessive gene linked to **X** chromosome. The normal gene may be represented by **X<sup>H</sup>**.

i) What is the genotype of a haemophilic female? (1mk)

.....  
 .....

ii) A woman who is a carrier for the haemophilia gene marries a normal man. Work out the phenotypic ratio for their offspring. (4mk)

iii) Haemophilia is more common in males than in females. Explain this phenomenon. (2mks)

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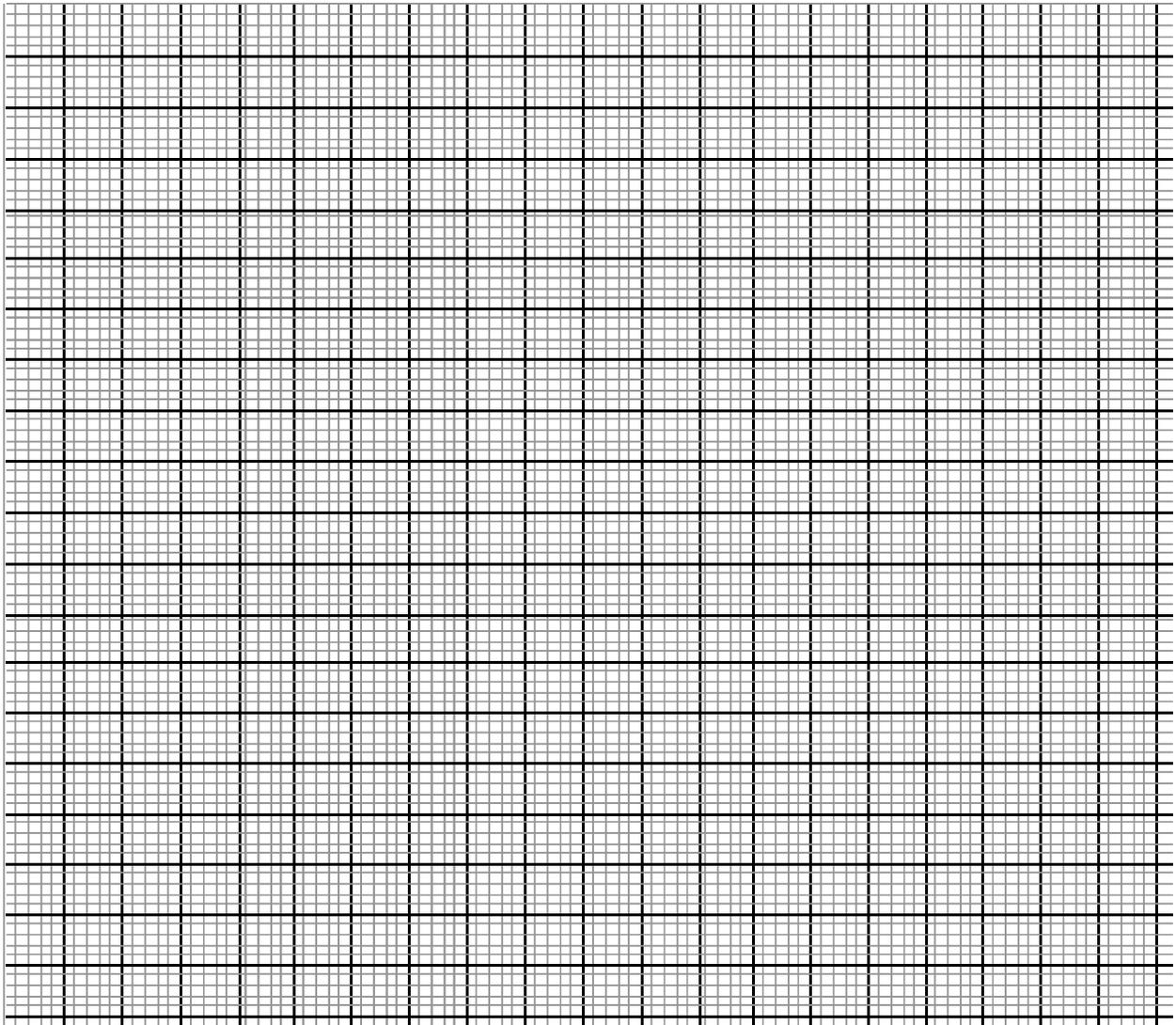
**SECTION B (40 MARKS)**

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

6. The table below shows how the quantities of sweat and urine vary with external temperature.

External temperature	Urine cm <sup>3</sup> /hr	Sweat cm <sup>3</sup> /hr
0	100	5
5	90	6
10	80	10
15	70	20
20	60	30
25	50	60
30	40	120
35	30	200

(a) On the same axis plot graphs of the quantities of urine and sweat produced against the external temperature. (7mks)



(b) At what temperatures are the amounts of sweat and urine produced equal? (1mk)

.....  
.....

(c) What happens to the amount of sweat produced as the temperature rises? Explain the observation. (3Mks)

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.....  
.....

(d) Account for the observation made on the amount of urine produced as the temperature increases (3Mks)

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(e) (i) How is the kidney adapted to its function (4mks)

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(ii) Differentiate between excretion and egestion. (2mks)

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.....  
.....  
.....

7. Explain how the following organisms are adapted to their mode of feeding

(a) Herbivores. (10mks)

(b) Carnivores. (10mks)

8. Describe how hormones regulate the mensural cycle in human beings. (20mks)



