FORM FOUR CLUSTER KCSE MODEL1

BIOLOGY PAPER 2 QUESTIONS

SECTION A (40 Marks)

Answer all the questions in this section

1. Study the equation below and answer the following questions

$$6CO_2 + 6H_2O \xrightarrow{LIGHT} C_6H_{12}O_6 + 6O_2$$

a) Name the kingdom whose organisms exhibit the above process. (1mark)

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b) What is significance of the light in the above process? (1mark)

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c) i) Name the organelle in which the process takes place. (1mark)

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ii) State two ways the above named organelle is adapted to its function. (2marks)

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d) What happens to the end- products of the process above? (2marks)

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2. When a pure breeding white flowered rose plant was crossed with a pure breeding red flowered rose plant, the F1 offspring had pink flowers.
a) Using letter W to represent the gene for white colour and letter R for red colour work out the genotypic ratio of the F2 generation. (5marks)

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b) What is meant by the term Hybrid vigour? (1mark)

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c) Write two advantages of Hybrid vigour. (2marks)

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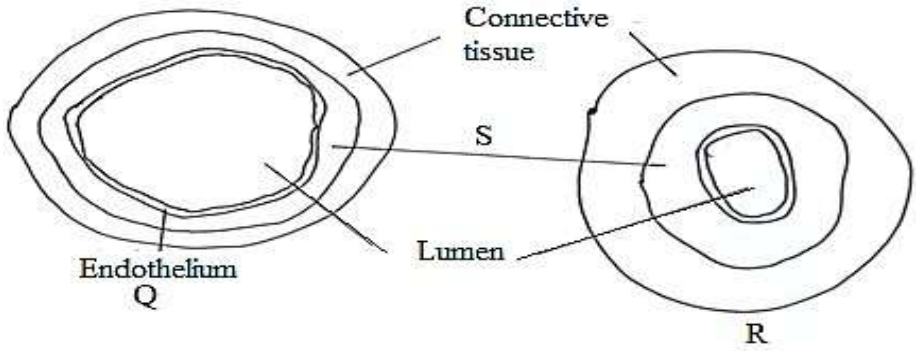
3. The diagrams below shows the transverse sections of two different blood vessels.



a) Identify the type of blood vessel presented by Q
…… (1mark)

R… ……(1mark)

b) If Q and R represent blood vessels that are not found in the heart, write down one structural difference between them,other than what is presented in the diagrams. (1mark)

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c) Name the type of muscles found in S. (1mark)

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d) Describe the condition known as coronary thrombosis. (2marks)

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e) Distinguish between single and double circulatory systems. (2marks)
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4. a) What is the role of the following hormones in the human body?
i) Follicle Stimulating Hormone. (1mark)

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ii) Testosterone. (1mark)
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b) List down two mechanisms exhibited by flowering plants to hinder pollination and self-fertilization. (2marks) ……
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c) Explain briefly the advantages of sexual reproduction in organisms. (2marks)
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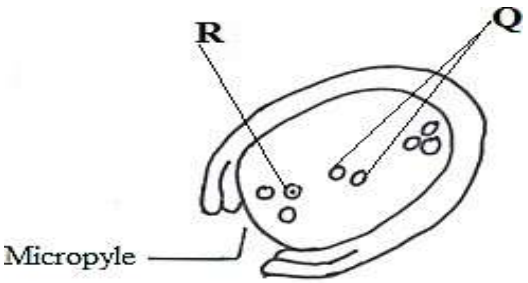
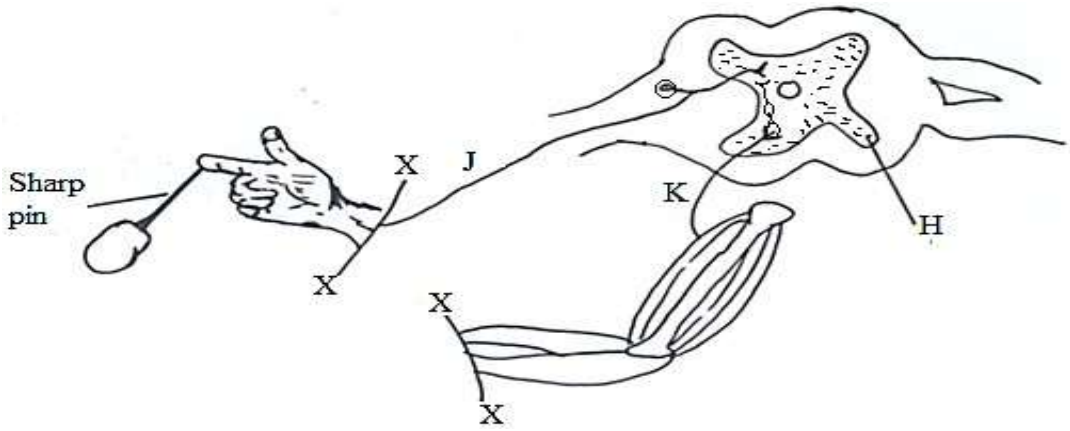
d) The diagram below illustrates an embryo sac



i) Name the structures labelled Q…… (1mark)
ii) Name the structure that is formed by R immediately after fertilization

…… (1mark)

5. The diagram below shows the relationship between a stimulus and a response in the body.



a) Name the type of response represented in the diagram (1mark)
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b) Name the neurones represented by J and K. (2marks)

J……

K……
c) Draw an arrow inside the organ H to show the direction of impulse transmission. (1mark)
d) Explain briefly how the muscles of the upper arm and the bones of the lower arm

work together to bring about the response. (2marks)

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e) Write two differences between tactic and tropic responses. (2marks)

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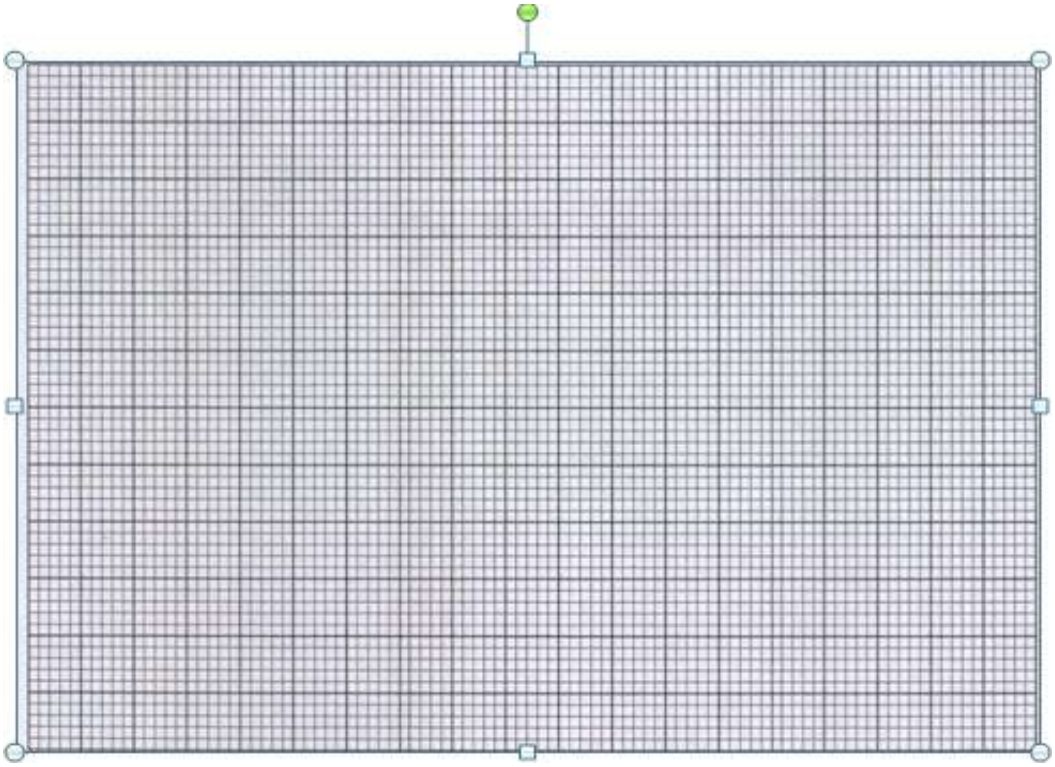
SECTION B (40 Marks)

Answer question 6 (compulsory) and either question 7 or 8

6. In a natural ecosystem the relative number of wolves and hares were determined over a period of 16 years as shown below.

Time in years	Population in Relative numbers	
	Population of Hares	Population of wolves
0	240	120
1	270	160
3	340	230
4	350	260
5	335	285
6	300	315
7	260	335
8	220	300
10	120	185
11	95	140
12	105	95
13	130	80
14	165	120
16	260	180

a) Using the same axes draw graphs of the relative populations of both animals against time. (8marks)



b) Account for the populations of wolves and hares between the 1st and the 6th years.

i) Wolves (2marks)

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ii) Hares (3marks)

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c) When were the two populations equal? (2marks)

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d) What would be the effect of introducing wild dogs in this ecosystem? (2marks)
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e) Write two other biotic factors that would regulate the populations of both animals in the ecosystem. (2marks) ……
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f) State one characteristic of a population. (1mark)

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7. a) Describe how environmental factors increase the rate of transpiration in terrestrial plants. (10marks)

   b) Describe the process of secondary thickening in flowering plants. (10marks)

8. a) Describe the homeostatic functions of the mammalian skin. (16marks)

   b) Explain what happens in humans when the concentration of glucose decreases below the normal level. (4marks)