

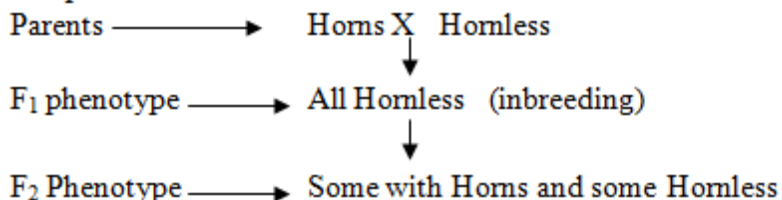
FORM FOUR CLUSTER KCSE MODEL10

BIOLOGY PAPER 2 QUESTIONS

SECTION A (40 Marks)

Answer all questions in this section in the spaces provided.

1. The presence or absence of horns in cattle is an inherited characteristic as shown in the chart below.

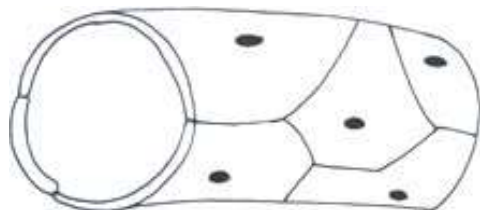


a) State the recessive allele with respect to horns in the above cattle. (1 mark)

b)(i) Using letters H and h, workout the F₂ genotypic ratio from the above cross. (5 marks)

(ii) A farm produced 72 hornless calves from the cross in b(i) above. Calculate the percentage of the calves which had horns. (2 marks)

2. The diagram below shows a portion of capillary blood vessel.



a)(i) Describe the wall of the capillary. (1 mark)

.....

.....

(ii) What is the significance of the structure of the wall in (a) (i) above to the function of the blood capillary? (1 mark)

.....

.....

b) Name: i. Two substances that move from the capillary into tissue fluid. (2 marks)

.....

.....

ii. Move from tissue fluid into the capillary. (2 marks)

.....

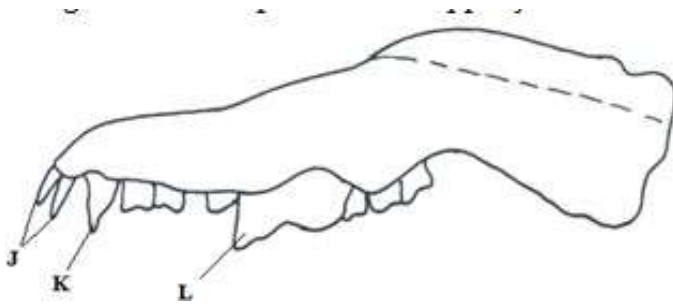
.....

c) State two structural adaptations of arteries to their functions. (2 marks)

.....

.....

3. The diagram below represents the upper jaw of a mammal.



a) Name the mode of nutrition of the mammal whose jaw is shown. (1 mark)

b)(i) Identify the teeth J and L. (2 marks)

J.....
L.....

ii) State one adaptation of tooth L to its function. (1 mark)

c) State two components of the pulp cavity. (2 marks)

d)(i) Name the hardest part of the tooth. (1 mark)

(ii) What substance is responsible for the hardening of the part in (d) (i) above. (1 mark)

4. a) An investigation was carried out to study the effects of the concentration of sucrose solutions on pieces of tulip stem 45 mm in length. The pieces were placed in different concentrations of sucrose solutions and measured after two hours immersion.

The table below shows the results of the experiment.

Sucrose conc (moles per litre)	0.2	0.3	0.4	0.5	0.6	0.7	0.8
Length after 2 hours (mm)	50	48	46	44	42	42	42

(i) Explain the effects of 0.2 per litre sucrose solution on the length of the pieces of the tulip stem. (3 marks)

(ii) From the above table, predict the concentration of sucrose solution that was isotonic to tulip cells. (2 marks)

(iii) Which term can be used to describe sucrose solution whose concentration was 0.7 moles per litre in this experiment? (1 mark)

b) Differentiate between haemolysis and crenation. (2 marks)

5. a) How are the following parts of a leaf adapted to their functions?

i. Palisade mesophyll layer (2 marks)

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

ii. Cuticle (2 marks)

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

(ii) Give two differences between leaves of monocots and those of dicots other than venation. (2 marks)

.....
.....

SECTION B (40 Marks)

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

6. In a certain farm in Nigeria, the number of brown ear ticks per cattle before and after spraying with a constant concentration of a specific acaricide was determined for a period of 20 years when the spraying was done once per month. The results are shown in the table below.

Time (yrs)	0	1	3	4	6	10	13	16	18	20
No. of ticks per cattle	100	60	20	12	10	18	26	36	44	50

a) Plot number of ticks per cattle against time in years on the provided grid. (6 marks)

b) What was the number of ticks per cattle after 8 years. (1 mark)

.....

c) Account for the number of ticks per cattle between:-

i. 0-6 years (2 marks)

ii. 6-20 years (4 marks)

d) Give two disadvantages of using acaricides in tick control. (2 marks)

.....
.....

e) Name the appropriate method used to estimate the number of ticks per cattle. (1 mark)

.....

f) How would Larmack explain why all ducks have webbed feet? (4 marks)

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

7. How is the gaseous exchange system of a man adapted to its functions?

8. How are leaves of mesophytes suited to the role of photosynthesis. (20 marks)