



MANYAM FRANCHISE
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23.4 BIOLOGY (231)

23.4.1 Biology Paper 1 (231/1)

Name Index No.

231/1
BIOLOGY
Paper 1
(Theory)
Oct./Nov. 2006
2 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL
Kenya Certificate of Secondary Education
BIOLOGY
Paper 1
(Theory)
2 hours

*Write your name and index number in the spaces provided above.
Answer ALL the questions in the spaces provided.*

For Examiner's Use Only

Question	Maximum Score	Candidate's Score
1-27	80	

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

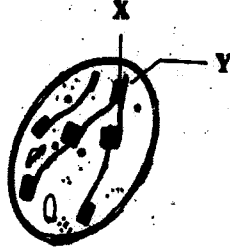
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Turn over

1 (a) State the function of cristae in mitochondria. (1 mark)

(b) The diagram below represents a cell organelle.



(i) Name the part labelled Y. (1 mark)

(ii) State the function of the part labelled X. (1 mark)

2 Name the part of a flower that develops into

(a) seed (1 mark)

(b) fruit. (1 mark)

3 (a) Name two tissues in plants which are thickened with lignin. (2 marks)

(b) How is support attained in herbaceous plants? (1 mark)

4 (a) Name the fluid that is produced by sebaceous glands. (1 mark)

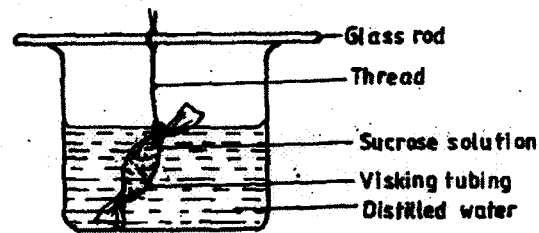
(b) What is the role of sweat on the human skin? (2 marks)

5 State two ways in which floating leaves of aquatic plants are adapted to gaseous exchange. (2 marks)

6 (a) State three characteristics of Monera that are not found in other kingdoms. (3 marks)

(b) Name the class to which a termite belongs. (1 mark)

- 7 (a) Name one defect of the circulatory system in humans. (1 mark)
- (b) State three functions of blood other than transport. (3 marks)
- 8 State the role of vitamin C in humans. (2 marks)
- 9 (a) State two processes which occur during anaphase of mitosis. (2 marks)
- (b) What is the significance of meiosis? (2 marks)
- 10 State the importance of tactic response among some members of kingdom Protista. (1 mark)
- 11 State the role of insulin in the human body. (1 mark)
- 12 An experiment was set up as shown in the diagram below.

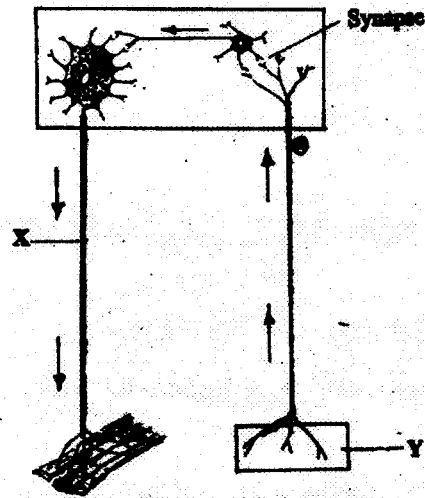


The set up was left for 30 minutes.

- (a) State the expected results. (1 mark)
- (b) Explain your answer in (a) above. (3 marks)
- 13 (a) In what form is energy stored in muscles? (1 mark)
- (b) State the economic importance of anaerobic respiration in plants. (2 marks)
- 14 (a) Distinguish between epigeal and hypogeal germination. (1 mark)

- (b) Why is oxygen necessary in the germination of seeds? (2 marks)
- 15 Explain continental drift as an evidence of evolution. (3 marks)
- 16 What is the importance of the following in an ecosystem? (2 marks)
- (a) Decomposers.
- (b) Predation.
- 17 (a) Distinguish between the terms homodont and heterodont. (1 mark)
- (b) What is the function of carnassial teeth? (1 mark)
- (c) A certain animal has no incisors, no canines, 6 premolars and 6 molars in its upper jaw. In the lower jaw there are 6 incisors, 2 canines, 6 premolars and 6 molars. Write its dental formula. (1 mark)
- 18 (a) State two functions of bile juice in the digestion of food. (2 marks)
- (b) How does substrate concentration affect the rate of enzyme action? (1 mark)
- 19 (a) Explain how the following prevent self-pollination:
- (i) protoandry (1 mark)
- (ii) self-sterility. (1 mark)
- (b) Give three advantages of cross-pollination. (3 marks)
- 20 (a) What name is given to response to contact with surface exhibited by tendrils and climbing stems in plants? (1 mark)
- (b) State three biological importance of tropisms to plants. (3 marks)

21 The diagram below represents a reflex arc in human.



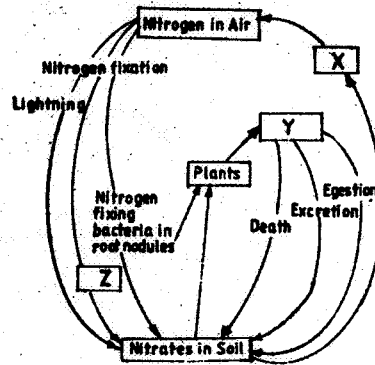
- (a) Name the parts labelled X and Y. (2 marks)
- (b) Name the substance that is responsible for the transmission of an impulse across the synapse. (1 mark)
- 22 (a) State the function of the ciliary muscles in the human eye. (1 mark)
- (b) State two functional differences between the rods and cones in the human eye. (2 marks)
- 23 State the function of each of the following parts of human ear. (4 marks)
- (a) Ear ossicles.
- (b) Cochlea.
- (c) Semi-circular canals.
- (d) Eustachian tube.

24 State four ways in which respiratory surfaces are suited to their function. (4 marks)

25 (a) A dog weighing 15.2 kg requires 216 kJ while a mouse weighing 50 g requires 2736 kJ per day. Explain. (2 marks)

(b) What is the end-product of respiration in animals when there is insufficient oxygen supply? (1 mark)

26 The chart below represents a simplified nitrogen cycle.



What is represented by X, Y and Z? (3 marks)

27 Name the end-products of the light stage in photosynthesis. (2 marks)

23.4.2 Biology Paper 2 (231/2)

Name Index No.

231/2
BIOLOGY
Paper 2
Oct./Nov. 2006
2 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL
Kenya Certificate of Secondary Education
BIOLOGY
Paper 2
2 hours

*Write your name and Index Number in the spaces provided above.
This paper consists 2 sections; A and B.
Answer ALL the questions in section A in the spaces provided.
In section B answer question 6 (compulsory) and either question 7 or 8 in the spaces provided after question 8.*

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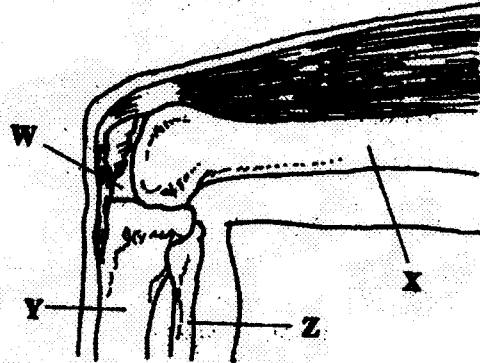
Section	Question	Maximum Score	Candidate's Score
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
B	6	20	
	7	20	
	8	20	
Total Score		80	

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

SECTION A (40 marks)

Answer ALL the questions in this section in the spaces provided.

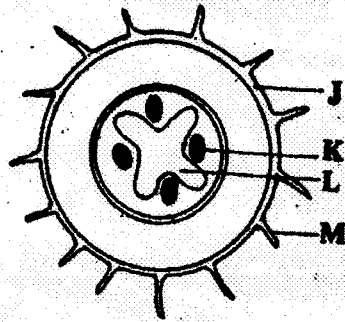
- 1** The diagram below represents bones at a joint found in the hind limb of a mammal.



- (a) Name the bones labelled X, Y and Z. (3 marks)
- (b) (i) Name the substance found in the place labelled W. (1 mark)
- (ii) State the function of the substance named in (b) (i) above. (1 mark)
- (c) Name the structure that joins the bones together at the joint. (1 mark)
- (d) State the difference between ball and socket joint and the one illustrated in the diagram above. (1 mark)
- (e) Name the structure at the elbow that performs the same function as the patella. (1 mark)
- 2** (a) Name two disorders in humans caused by gene mutation. (2 marks)
- (b) Describe the following chromosomal mutations: (2 marks)
- (i) inversion
- (ii) translocation.
- (c) In mice the allele for black fur is dominant to the allele for brown fur. What percentage offspring would have brown fur from a cross between heterozygous black mice and brown mice? Show your working. (4 marks)
- Use letter B to represent the allele for black colour.

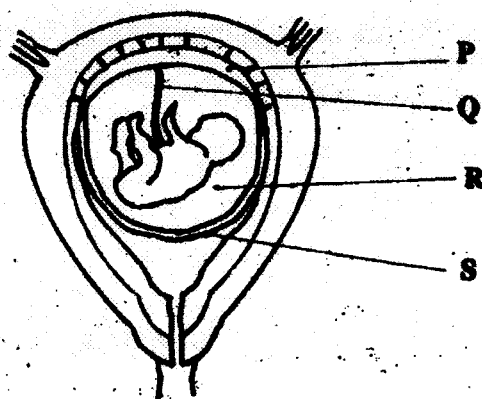
- 3 (a) Distinguish between pyramid of numbers and pyramid of biomass. (2 marks)
- (b) Give three reasons for loss of energy from one trophic level to another in a food chain. (3 marks)
- (c) Describe how the belt transect can be used in estimating the population of a shrub in a grassland. (3 marks)

4 The diagram below represents a transverse section through a plant organ.



- (a) From which plant organ was the section obtained? (1 mark)
- (b) Give two reasons for your answer in (a) above. (2 marks)
- (c) Name the parts labelled J, K and L. (3 marks)
- (d) State two functions of the part labelled M. (2 marks)

5 The diagram below represents a human foetus in a uterus.



- (a) Name the part labelled S. (1 mark)

- (b) (i) Name the types of blood vessels found in the structure labelled Q. (2 marks)
- (ii) State the difference in composition of blood found in the vessels named in (b) (i) above. (2 marks)
- (c) Name two features that enable the structure labelled P carry out its function. (2 marks)
- (d) State the role of the part labelled R. (1 mark)

SECTION B (40 marks)

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

- 6 An experiment was carried out to investigate the effect of hormones on growth of lateral buds of three pea plants.

The shoots were treated as follows:

Shoot A - Apical bud was removed.

Shoot B - Apical bud was removed and gibberellic acid placed on the cut shoot.

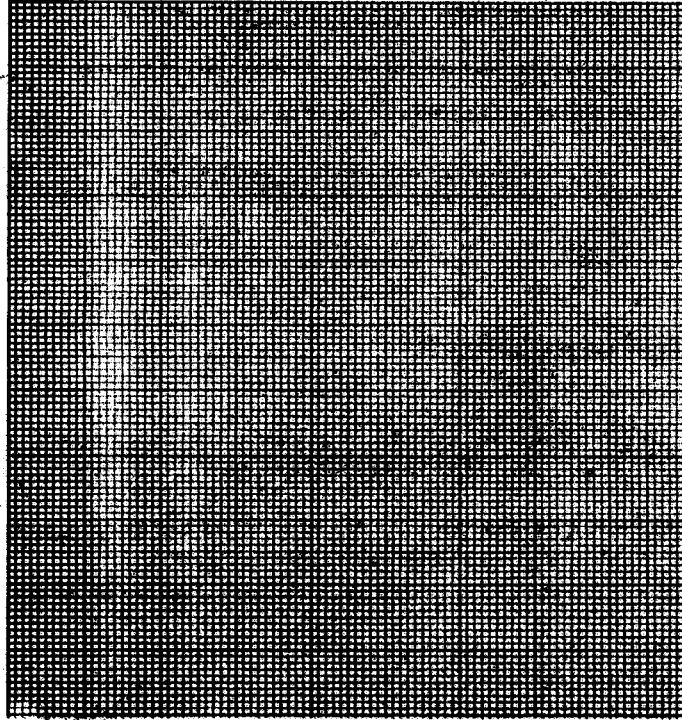
Shoot C - Apical bud was left intact.

The lengths of the branches developing from the lateral buds were determined at regular intervals.

The results obtained are shown in the table below.

Time in days	Length of branches in millimetres		
	Shoot A	Shoot B	Shoot C
0	3	3	3
2	10	12	3
4	28	48	8
6	50	90	14
8	80	120	20
10	118	152	26

- (a) Using the same axes, draw graphs to show the lengths of branches against time. (8 marks)



- (b) (i) What was the length of the branch in shoot B on the 7th day? (1 mark)
- (ii) What would be the expected length of the branch developing from shoot A on the 11th day? (1 mark)
- (c) Account for the results obtained in the experiment. (6 marks)
- (d) Why was shoot C included in the experiment? (1 mark)
- (e) What is the importance of gibberellic acid in agriculture? (1 mark)
- (f) State two physiological processes that are brought about by the application of gibberellic acid on plants. (2 marks)
7. Describe how the human kidneys function. (20 marks)
8. Describe how water moves from the soil to the leaves in a tree. (20 marks)

23.4.3 Biology Paper 3 (231/3)

Name Index No.

231/3
BIOLOGY
Paper 3
(PRACTICAL)
Oct/Nov.2006
1³/₄ hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL
Kenya Certificate of Secondary Education
BIOLOGY
Paper 3
(PRACTICAL)
1³/₄ hours

INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided at the top of this page.
Answer all the questions.
You are required to spend the first 15 minutes of the 1³/₄ hours allowed for this paper reading the whole paper carefully before commencing your work.
Answers must be written in the spaces provided in the question paper.
Additional pages must not be inserted.

For Examiner's Use Only

Question	Maximum Score	Candidate's Score
1	15	
2	12	
3	13	
Total Score	40	

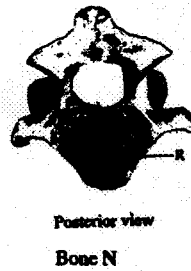
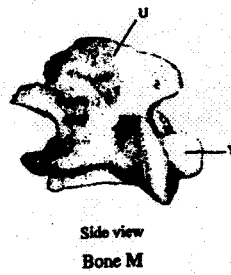
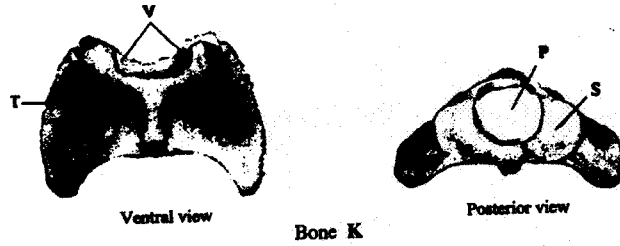
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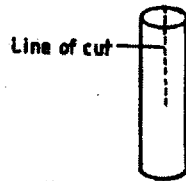
1. The photographs below are of bones obtained from the same region of a mammalian body. Photographs labelled K are different views of the same bone while M and N are views of different bones.



- (a) Name the region from which the bones were obtained. (1 mark)
- (b) Identify the bones. (3 marks)
- K
- M
- N
- (c) State three characteristic features of the bone in photographs labelled K. (3 marks)
- (d) Name the structures that fit in the opening labelled P in the photographs of bone K. (2 marks)
- (e) State the functions of the parts labelled S and T in photographs of bone K. (2 marks)
- (f) Name the structures that articulate with the parts labelled V in the photographs of bone K. (1 mark)

(g) Name the parts labelled U and V in the photograph of bone M and R in the photograph of bone N. (3 marks)

2. You are provided with two pieces of plant material labelled specimen D. Using a scalpel cut a slit halfway through the middle of each piece as shown in the diagram below.



Place one piece in the solution labelled L₁ and the other in solution labelled L₂. Allow the set up to stand for 30 minutes.

(a) After 30 minutes remove the pieces and press each gently between the fingers.

(i) Record your observations.

L₁ (1 mark)

L₂ (1 mark)

(b) Examining the pieces.

(i) Record other observations beside those made in (a) (i) above. (3 marks)

(ii) Account for the observations in (a) (i) above. (5 marks)

(ii) Account for the observations in (b) (i) above. (2 marks)

3. You are provided with three sets of seedlings labelled A, B and C. Examine them.

(a) State the conditions under which each set was grown. (3 marks)

(b) State four differences between the seedlings in set A and B. (4 marks)

(c) (i) Name the phenomenon exhibited by seedlings in set B. (1 mark)

(ii) Give a reason why plants exhibit the phenomenon named in (c)(i) above. (1 mark)

(d) Name the response exhibited by the seedlings in set C. (1 mark)

(e) Explain how the response named in (d) above occurred. (3 marks)