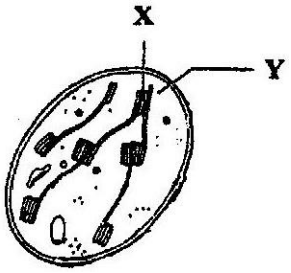
BIOLOGY PAPER 231/1 K.C.SE 2006
QUESTIONS.

1. a) State the functions of cristae in mitochondria.
b) The diagram below represents a cell organelle.



(i) Name the part labeled Y. (1mk)
(ii) State the functions of the part labeled X. (1mk)

2. Name the part of the flower that develops into
a) Seed
b) Fruit (1mk)

3. a) Name two tissues in plants which are thickened with lignin. (2mks)
b) How is support attained herbaceous plants? (1mks)

4. a) Name the fluid that is produced by sebaceous glands. (1mk)
b) What is the role of sweat in human skin? (2mks)

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

6. a) State three characteristics of Monera that are not found in other kingdoms. (3mks)
b) Name the class to which a termite belongs (1mk)

7. a) Name one defect of circulatory system in humans. (1mk)
b) state three functions of blood other than transport. (3mks)

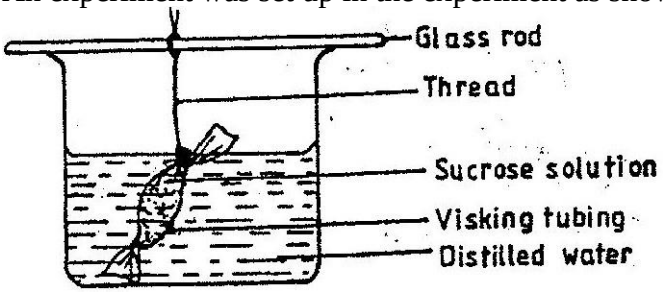
8. State the role of vitamin C in humans. (2mks)

9. a) State two processes which occur during anaphase of mitosis. (2mks)
b) What is significance of meiosis? (2mks)

10. State the important of tactic response among some members of kingdom protista. (1mks)

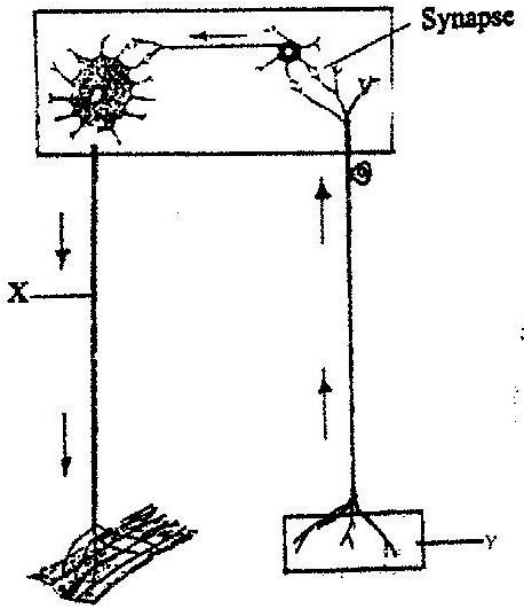
11. State the role of insulin in human body. (1mks)

12. An experiment was set up in the experiment as show below.



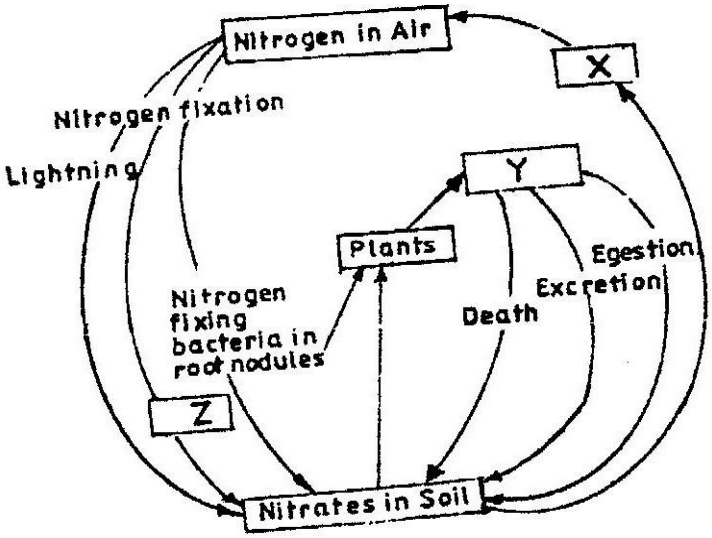
The set up was left for 30 minutes.
a) State the expected results. (1mk)
b) Explain your answer in (a) above (3mks)

13. a) In what form is energy stored in muscles (1mk)
    b) State the economic important of anaerobic respiration in plants.(2mks)
14. a) Distinguish between epigeal and hypogeal germination. (1,mk)
    b) Why is oxygen necessary in the germination of seeds? (2mks)
15. Explain continental drift as an evidence of evolution. (3mks)
16. What is the importance of the following in an ecosystem? (2mks)
    a) Decomposers
    b) Predation
17. a) Distinguish between the terms homodont and heterodont. (1mk)
    b) What is the function of carnassials teeth? (1mk)
    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 six molars.
    Write its dental formula.
18. a) State two functions of bile juice in the digestion of food. (2mks)
    b) How does substrate concentration affect the rate of enzyme action?(1mk)
19 a) Explain how the following prevent self pollination. (1mk)
        (i) Protoadry
        (ii) Self – sterility.
    b) Give three advantages of cross pollination. (3mks)
20 a) What name is given to response to contact with surface exhibited by tendrils and climbing stems in plants?
    b) State three biological importance of tropisms plants.
21. The diagram below represents a reflex are in human.



    a) Name the parts labeled X and Y
    b) Name the substance that is responsible for the transmission of an impulse across the synapse. (1mks)
22. a) State the function of ciliary muscles in the human eye. (1mk)
    b) State two functional differences between the rods and cones in the human eye. (2mks)

23. State the function of each of the following parts of human ear. (4mks)
    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. (4mks)
25. a)A dog weighing 15.2kg requires 216kj while a mouse weighing 50g requires 2736kj per day. Explain. (2mks)
26. The chart below represents a simplified nitrogen cycle.

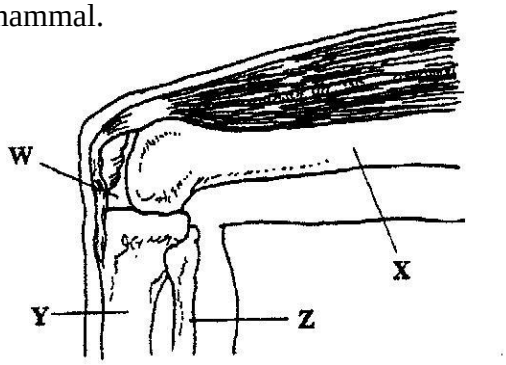


What is represented by X,Y, and Z?

27. Name the end products of the light stage in photosynthesis.

BIOLOGY PAPER 231/2 K.C.S.E 2006
QUESTIONS

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

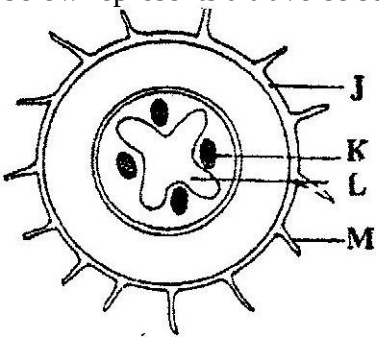


a) Name the bones labeled XY and Z (3mks)
b) i) Name the substance found in the place labeled W. (1mk)
ii) State the function of the substance named in (b) (i) above. (1mk)
c) Name the structure that joins the bones together at the joint.(1mk)
d) State the differences between ball and socket joint and the one illustrated in the diagram above. (1mk)
e) Name the structure at the elbow that performs the same function as the same function as the patella.(1mk)

2. a) Name two disorder in human caused by gene mutation. (2mks)
b) Describe the following chromosomal mutations. (2mks)
a. Inversion
b. Translocation.
c) In mice the allele for black fur is dominant to the allele for brown fur. What percentage offspring would have brown fur form across between heterozygous black mice? Show your working.
Use letter B to represent the allele for black colour. (4mks)

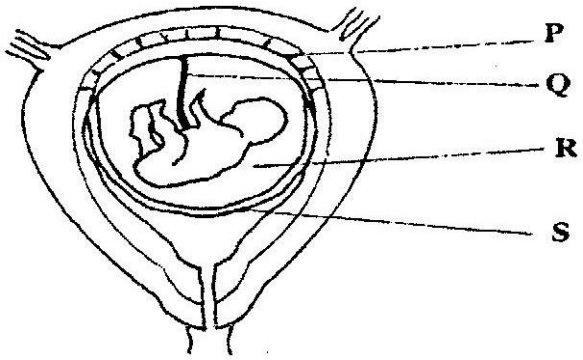
3. a) Distinguish between pyramid of numbers and pyramid of biomass. (2mks)
b) Give three reasons for loss of energy from one trophic level to another in the food chain. (3mks)

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



A. From which plant organ was the section obtained? (1 mk)
B. Give two reasons for your answer in (a) above. (2mks)
C. Name the parts labeled J,K and L. (3mks)
D. State two functions of the part labeled M. (2mks)

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



a) Name the part labeled S. (1mk)
b) i) Name the types of blood vessels found in the structure labeled Q. (2mks)
ii) State the differences in composition of blood found in the vessels named in (b)(i) above. (2mks)
c) Name two features that enable the structure labeled P carry out its function. (2mks)
d) State the role of the part labeled R (1mk)

SECTION B

Answer question 6 (compulsory) in the spaces provided and either question 7 or 8 in the spaces provided and either 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 length of the branches developing from lateral buds were determined at regular intervals.

The results obtained are as shown in the table below.

Time in days	Length of branches in millimeters		
	Shoot A	Shoot B	Shoot C
0	3	3	3
2	10	12	3
4	28	48	8
6	50	9	14
8	80	120	20
10	118	152	26

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

b)i) What was the length of the branch in shoot B on the 7^{th} day? (1mk)

ii) What would be the expected length of the branch developing from shoot A on the 11^{th} day? (1mk)

c) Account for the results Obtained in the experiment (6mks)

d) Why was shoot C included in the Experiment? (1mk)

e) What is the importance of gibberellic acid in agriculture? (1mk)

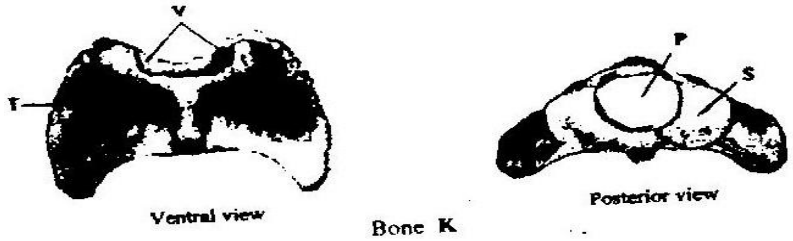
f) State two physiological processes that are brought about by the application of gibberellic acid on plants. (2mks)

7. Describe how human kidney functions (20mks)

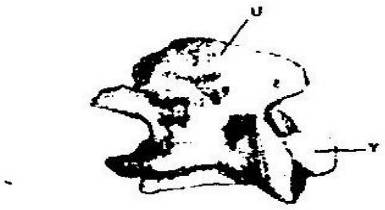
8. Describe how water moves from the soil to the leaves in a tree. (20mks)

BIOLOGY PAPER 3 (231/3) 2006
PRACTICAL QUESTIONS

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



Bone K



Bone M

Bone N

(a) Name the region from which the bones were obtained (1 mark)

(b) Identify the bones (3 marks)
K……..
M……
N…….

(c) State three characteristics feature of the bone in photographs labeled K (3 marks)

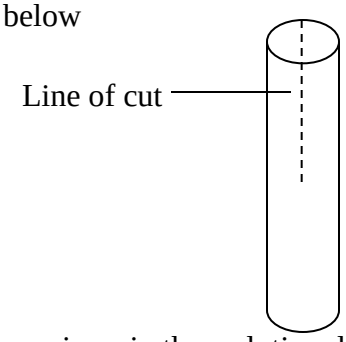
(d) Name the structure that fit in the opening labeled P in the photograph of bone K (2 marks)

(e) State the functions of the parts labeled S and T in photographs of bone K (2 marks)

(f) Name the structures that articulate with the parts labeled V in the photographs of bone K (1 mark)

(g) Name the parts labeled U and Y 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 labeled specimen D. Using a scalpel cut a slit halfway through the middle of each piece shown in the diagram below



Place one piece in the solution labeled L_1 and the other in solution labeled L_2 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

L_1…… (1 mark)

L_2…… (1 mark)

(b) Examine 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)

iii) Account for the observation in (b) (i) above (2 marks)

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

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

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

(c) (i) Name the phenomenon exhibited by seedling 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 seedling in set C (1 mark)

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

K.C.S.E 2007 BIOLOGY PAPER 1
QUESTIONS

1. (a) What is meant by the term binomial nomenclature (1 mark)
   (b) Give two reasons why classification is important (2 marks)

2. (a) What is the formula for calculating linear magnification of a specimen when using a hand lens? (1 mark)
   (b) Give a reason why staining is necessary when preparing specimens for observation under the microscope (1 mark)

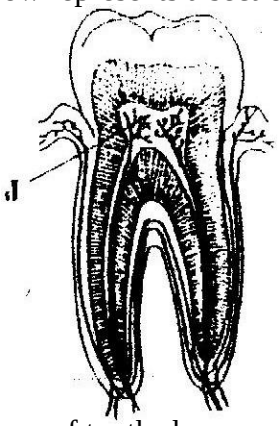
3. Plant cells do not burst when immersed in distilled water. Explain (2 marks)

4. State three functions of Golgi apparatus (3 marks)

5. Distinguish between diffusion and osmosis (2 marks)

6. Describe what happens during the light stage of photosynthesis (3 marks)

7. The diagram below represents a section though a human tooth



(a) (i) Name the type of tooth shown (1 mark)

(ii) Give a reason for your answer in (a) (i) above (1 mark)

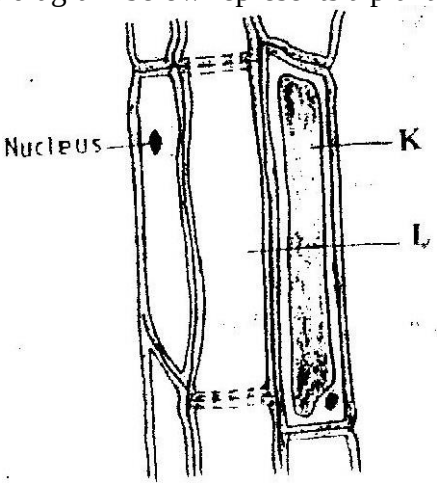
(b) State the functions of the structures found in part labeled J (2 marks)

8. (a) Name a fat soluble vitamin manufactured by the human body (1 mark)

   (b) State two functions of potassium in the human body (2 marks)

9. State two ways in which the root hairs are adapted to their function (2 marks)

10. The diagram below represents a plant tissue



(a) Name the tissue (1 mark)

(b) Name the cells labeled K and L. (2 marks)

K……
L……

(c) What is the function of the companion cell? (1 mark)

11. (a) What prevents blood in veins from flowing backwards? (1 mark)

(b) State tow ways in which the blood cells are adapted to their function (2 marks)

12. (a) Name two structures for gaseous exchange in aquatic plants (2 marks)

(b) What is the effect of contraction of the diaphragm muscles during breathing in mammals? (3 marks)

13. (a) Name the products of anaerobic respiration in
(i) Plants (1 mark)
(ii) Animals (1 mark)

(b) What is oxygen debt? (1 mark)

14 (a) What is the meaning of the terms
(i) Homeostatic (1 mark)
(ii) Osmoregulation? (1 mark)

(b) Name the hormones involved in regulating glucose level in blood (2 marks)

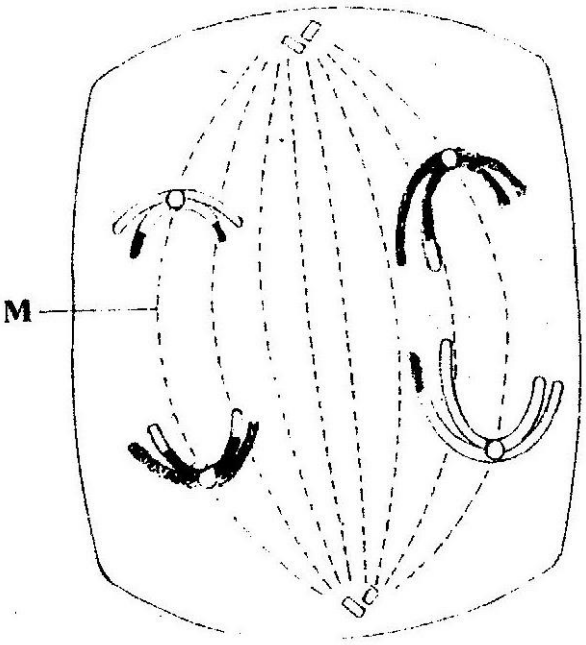
15 (a) Distinguish between population and community (2 marks)

(b) Name a method that could be used to estimate the population size of the following organisms
(i) Fish in a pond (1 mark)

(ii) Black jack in a garden (1mark)

16 State two ways in which schritosoma species is adapted to parasitic mode of life (2 marks)

17 The diagram below represents a stage during cell division



(a) (i) Identify the stage of cell division (1 mark)
(ii) Give three reasons for your answer in (a) (i) above (2 marks)

(b) Name the structures labeled M (1 mark)

18. State two disadvantages of sexual reproduction in animals (2 marks)

19 (a) State two environmental conditions that can cause seed dormancy (2 marks)

(b) Name the part of a bean that elongates to bring about epigeal germination (1 mark)

20 (a) What is meant by the term allele? (1 mark)

(b) Explain how the following occur during gene mutation:
(i) Deletion (1 mark)
(ii) Inversion (1 mark)

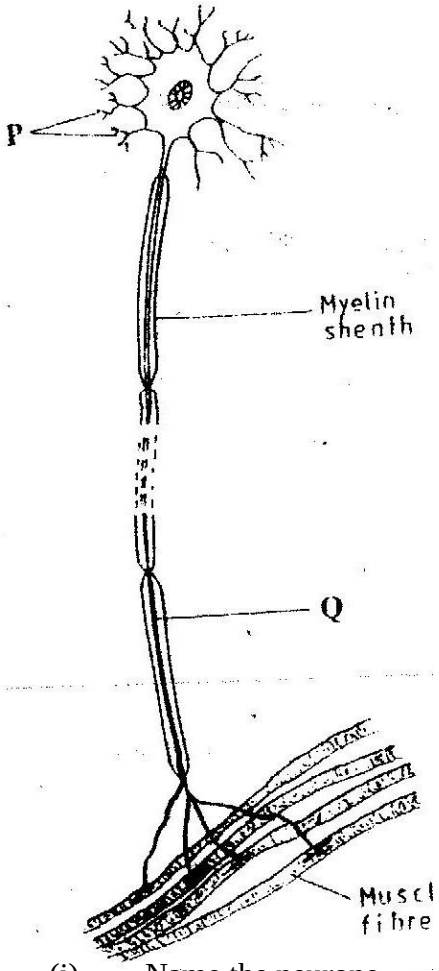
(c) What is a test- cross? (1 mark)

21. (a) What is adaptive radiation (2 marks)

(b) Give a reason why organisms become resistant to drugs (1 mark)

22. (a) Where in the human body are relay neurons found (1 mark)

(b) The diagram below represents a neurone (1 mark)



(i) Name the neurone (1 mark)

(ii) Name the parts labeled P and Q (2 marks)

P……..

Q…….

(c) State a function of myelin sheath (1 mark)

23 (a) Name the hormone that is responsible for apical dominance (1 mark)

(b) What is thigmotropism? (1 mark)

24. (a) state a characteristics that is common to all cervical vertebrae (1 mark)

(b) Name two tissues in plants that provide mechanical support (2 marks)

25. (a) The action of ptyalin stops at the stomach. Explain (1 mark)

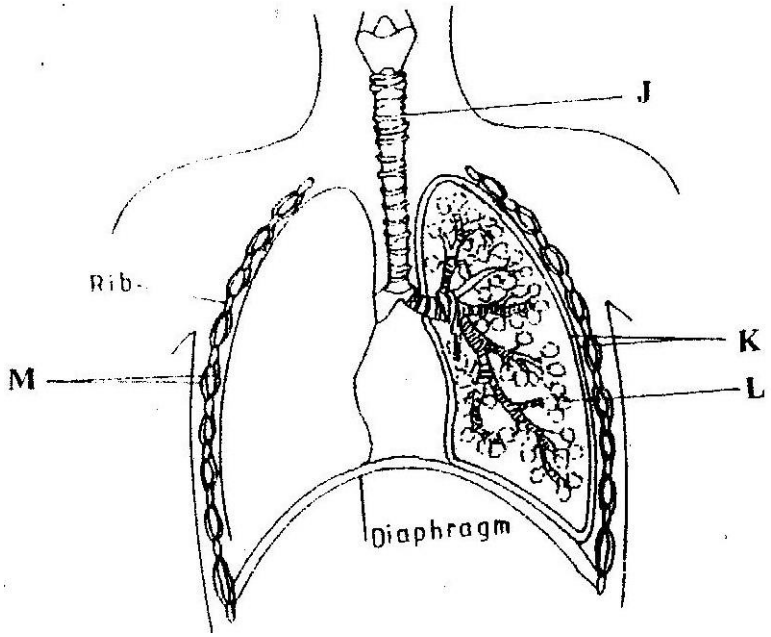
(b) State a factor that denatures enzymes (1 mark)

(c) Name the features that increase the surface area of small intestines (2 marks)

26. State one way by which HIV/AIDS is transmitted from mother to child (1 mark)

K.C.S.E 2007 BIOLOGY PAPER 2
SECTION A (40 marks)
Answer all questions in this section in the spaces provided

1. The diagram below represents some gaseous exchange structures in humans



(a) Name the structures labeled K, L, and M (3 marks)
K……
L……
M……

(b) How is the structure labeled J suited to its function? (3 marks)

(c) Name the process by which inhaled air moves from the structure labeled L into blood capillaries (1 mark)

(d) Give the scientific name of the organism that causes tuberculosis in humans (1 mark)

2 (a) Explain what happens to excess amino- acids in the liver of humans (3 marks)

(b) Which portion of the human nephron are only found in the cortex? (3 marks)

(c) (i) What would happen if a person produced less antidiuretic hormone? (1 mark)

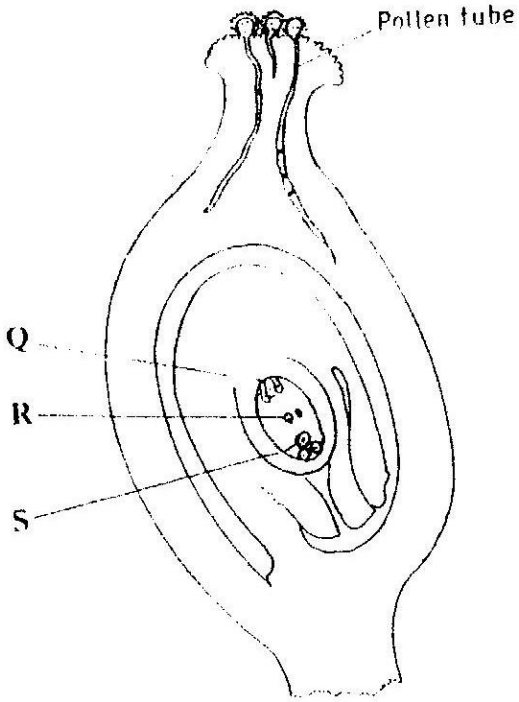
(ii) What term is given to the condition described in (c) (i) above (1 mark)

3 (a) What is meant by the following terms

(i) Protandry (1 mark)

(ii) Self sterility? (1 mark)

(b) The diagram below shows a stage during fertilization in a plant



(i) Name the parts labeled Q, R, and S (3 marks)

Q
R
S

(ii) State two functions of the pollen tube (2 marks)

(c) On the diagram label the micropyle (1 mark)

4 (a) Name the three type of muscles found in mammals and give an example of where each of them is found (3 marks)

Type of muscle	**Where found**
(i)	
(ii)	
(iii)	

(b) State the difference between ball and socket and hinge joint (1 mark)

(c) State the functions of synovial fluid (2 marks)

(d) State two advantages of having an exoskeleton (2 marks)

5. In maize the gene for purple colour is dominant to the gene for white colour. A pure breeding maize plant with purple grains was crossed with a heterozygous plant.

(a) (i) Using letter G to represent the gene for purple colour, work out the genotype ratio of the offspring (5 marks)

(ii) State the phenotype of the offspring (1 mark)

(b) What is genetic engineering? (1 mark)

(c) What is meant by hybrid vigour? (1 mark)

SECTION B (40 MARKS)

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

6. In the experiment to determine the effect of ringing on the concentration of sugar in phloem a ring of bark from the stem of a tree was cut and removed. The amount of sugar in grammes per $16cm^3$ piece of bark above the ring was measured over a 24 hour period. Sugar was also measured in the bark of a similar stem of a tree which was not ringed. The results are shown in the table below.

Time of the day	Amount of sugar in grammes per $16cm^3$ piece of bark	
	Normal stem	Ringed stem
06 45	0.78	0.78
09.45	0.80	0.91
12.45	0.81	0.01
15 45	0.80	1.04
18.45	0.77	1.00
21 45	0.73	0.95
00 45	0.65	0.88

(a) Using the same axes, plot a graph of the amount of sugar against time (6 marks)

(b) At what time was the amount of sugar highest in the
- (i) Ringed stem (1 mark)
- (ii) Normal stem? (1 mark)

(c) How much sugar would be in the ringed stem if it was measured at 0345 hours? (1 mark)

(d) Give reasons why there was sugar in the stems of both trees at 06 45 hours (2 marks)

(e) Account for the shape of the graph for the tree with ringed stem between:
- (i) 06 45 hours and 15 45 hours (3 marks)
- (ii) 15 45 hours and 00 45 hours (2 marks)

(f) Name the structures in phloem that are involved in the translocation of sugars (2 marks)

(g) Other than sugars name two compounds that are translocated in phloem (2 marks)

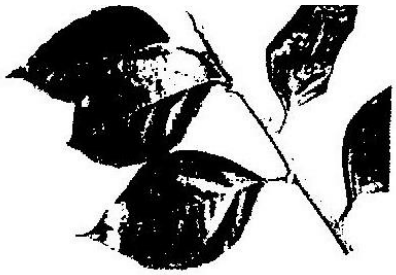
7. Describe the structure and functions of the various parts of the human ear (20 marks)

8. Describe causes and methods of controlling water pollution (20 marks)

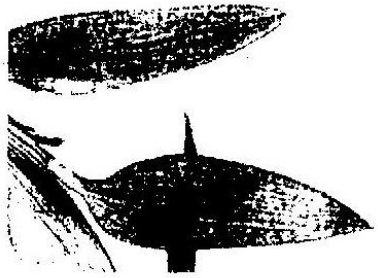
K.C.S.E 2007 BIOLOGY PAPER 3
PRACTICAL QUESTIONS

1. Below are photographs labeled P,Q,R,S,T,U and V of twigs obtained from plants examine them.

P

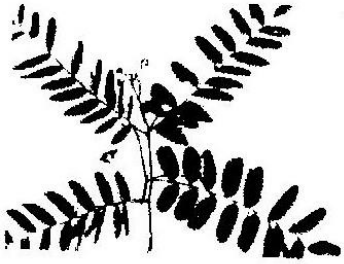


Q

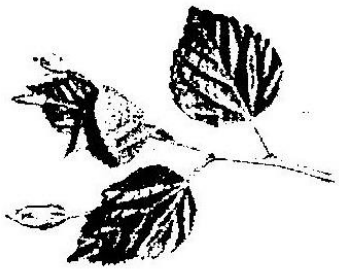


R

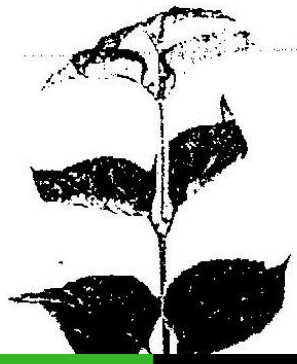
S



T



U



(a) Using observable features in the photographs. Complete the dichotomous key given below

1	a Simple leaves	go to 2
	b Compound leaves	go to 5
2	a Leaves net veined	go to 3
	b leaves parallel- veined	commerlinaceae
3	a……..	go to 4
	b leaves with smooth margin	Nyctsginaceae
4	a Leaves alternate	Malvaceae
	b ……	Verbenaceae
5	a…….	go to 6
	b leaves bipinnate	Bignoniaceae
6	a leaflet with serrated margin	Compositae
	b leaflets with smooth margin	Papilioceae

(b) Use the completed dichotomous key to identify the family tow hich each plant belongs
In each case show the steps you followed to arrive at the identity. (12 marks)

Identity	**Steps Followed**
P	
Q	
R	
S	
T	
U	
V	

2. You are provided with solutions labeled P,Q,S and a filter paper. The solution labeled P will be used in parts (a), (b) and (c).
Solution **Q** is iodine solution.

(a) Use the iodine solution to test for the presence of food substance in solution P.
Food substance (1 mark)

Procedure (1 mark)

Observation (1 mark)

Conclusion (1 mark)

Solutions **S** is Benedict's solution

(b) Use the benedict's solution to test for the presence of the food substance is solution P.

Food substance (1mark)

Procedure (2 marks)

Observation (1mark)

Conclusion (1 mark)

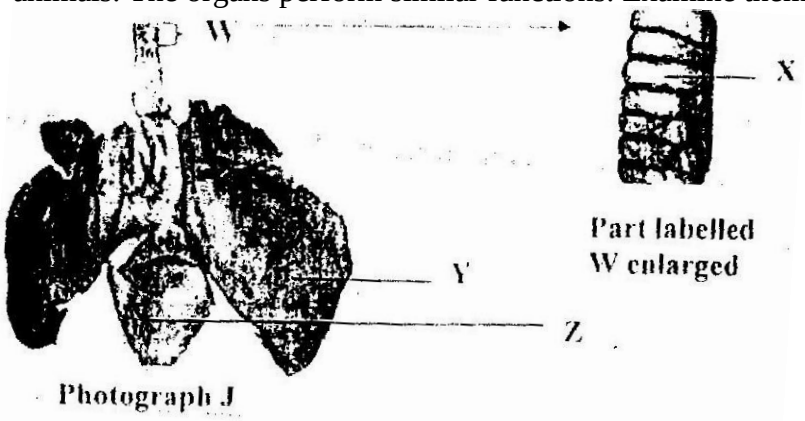
(c) Using the filter paper provided. Test for the presence of liquids in solutions P.

Procedure (2 marks)

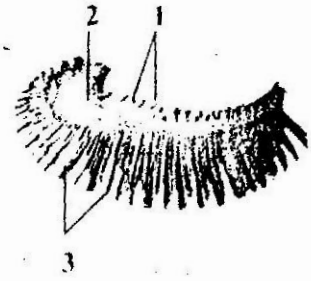
Observation (1mark)

Conclusion (1 mark)

3. Below are photographs labeled J and K of organs obtained from different animals. The organs perform similar functions. Examine them.



Photograph J



Photograph K

(a) Identify the organs (2 marks)

J

K

(b) State the functions performed by the organs (1 mark)

(c) Name the parts labeled X. Y and Z in photographs (3 marks)

X

Y

Z

(d) (i) Identify the parts labeled 1, 2 and 3 in photographs K (3 marks)

1.

2.

3.

(ii) Using observable features. State how the parts labeled 1 and 3 you identified in (d)(i) above are adapted to their function (4 mark)

1

2.

3

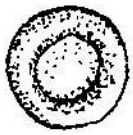
KCSE 2008 BIOLOGY PAPER 1
QUESTIONS

1. Name the tissues in plants responsible for:
   (a) Transport of water and mineral salts
   (b) Transport of carbohydrates
   (c) Primary growth (3 mks)

2. State the importance of the following processes that take place in the nephrons of a human kidney
   (a) Ultra filtration (1 mk)
   (b) Selective reabsorption (1 mk)

3. (a) Name a disease of the liver whose symptom is jaundice (1 mk)
   (b) State the causative agent of:
      (i) Cholera (1 mk)
      (ii) Candidiasis (1 mk)

4. The diagrams below show a red blood cell that was subjected to a certain Treatment



At start At the end of experiment
   (a) Account for shape of the cell at the end of the experiment (2 mks)
   (b) Draw a diagram to illustrate how a plant cell would appear if subjected to the same treatment (1 mk)

5. (a) State two factors that affect enzymatic activities (2 mks)
   (b) Explain how one of the factors stated in (a) above affects enzymatic Activities (1 mk)
6. (a) What is meant by non- disjunction? (1 mk)
   (b) Give two examples of continuous variation in humans (2 mks)
7. (a) what is fossil (1 mk)
   (b) How does convergent evolution occur (3 mks)

8. The diagram below shows a stage in mitosis in a plant cell

   (a) Name the stage of mitosis (1mk)
   (b) Give two reasons for your answer in (a) above (2 mks)
   (c) Name the part of the plant from which the cell used in preparation was Obtained (1 mk)
9. Give three factors that determine the amount of energy a human being require in a day (3 mks)

10. (a) Name the antigens that determine human blood groups (2 mks)

(b) State the adaptation that enables the red blood cells to move in blood Capillaries (1 mk)

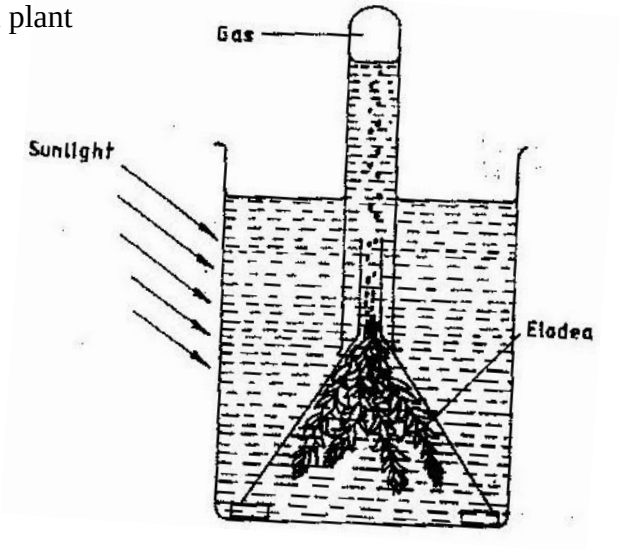
11. (a) What is homeostasis? (1 mk)
(b) Name three processes in the human body in which homeostasis is Involved (3 mks)

12. State two functions of the endoplasmic reticulum (2 mks)
13. (a) Name the part of retina where image is formed (1mk)
(b) State two characteristics of the image formed on the retina (2 mks)

14. Describe the three characteristics of a population (3 mks)

15. Explain what happens when there is oxygen debt in human muscles(2 mk)

16. The diagram below represents a set up that was used to investigate certain process in a plant



(a) State the process that was being investigated (1 mk)
(b) State a factor that would affect the process (1 mk)

17. Account for the following phases of a sigmoid curve of a growth of an organism
(a) Lag phase (1 mk)
(b) Plateau phase (1 mk)
18. How is the epidermis of a leaf of a green plant adapted to its function (2 mks)

19. The diagram below represents a tissue obtained from an animal

(a) Identify the tissue (1 mk)
(b) State the functions of the tissue named (a) above (1mk)

20. (a) what is a single circulatory system (1 mk)
(b) Name an organism which has single circulatory system (1 mk)
(c) Name the opening to the chamber of the heart of an insect (1 mk)

21. (a) What is seed dormancy (1 mk)
(b) Name a growth inhibitor in seeds (1 mk)

22. State two characteristics of aerenchyma tissue (1 mk)

23. The diagram below shows a human tooth (2 mks)

(a) Identify the tooth (1 mk)

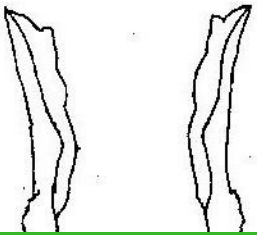
(b) How is the tooth adapted to its function (1 mk)

(c) State the role of the following vitamins in the human body
(i) C (1 mk)
(ii) K (1 mk)

24. Name the sites where light and dark reactions of photosynthesis take place (2 mks)
Light reaction
Dark reaction

25. Giving a reason in each case, name the class to w which each of the following organisms (4 mks)
Bean plant
Reason
Bat
Reason

30. The diagram below shows two fused bones of a mammal



(a) Identify the fused bone (1 mk)

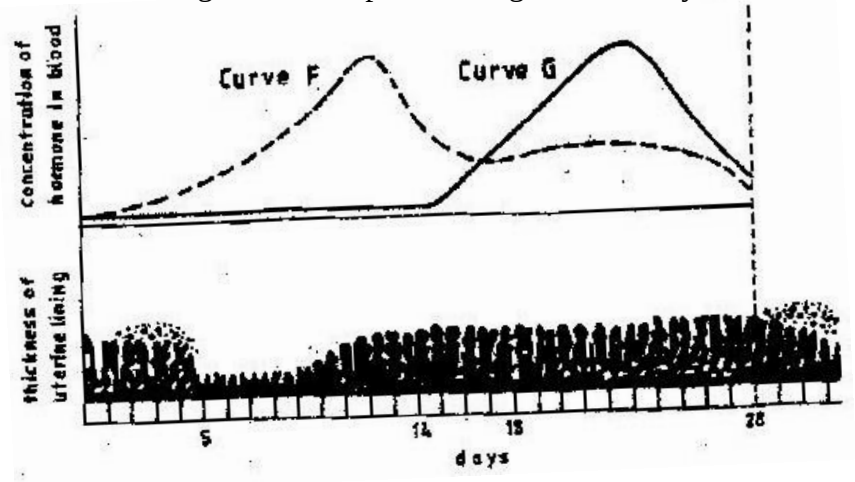
(b) Name the

(i) Bone that articulates at the point labelled F (1 mk)

(ii) The hole labelled G (1 mk)

KCSE 2008 PAPER 2
SECTION A (40 MKS)
Answer all the questions in this section in the spaces provided

1. The figure shows changes that take place during menstrual cycle in human



(a) Name the hormone whose concentrations are represented by curves F and G (2 mks)

(b) State the effects of the hormones named in (a) above on the lining of the uterus (2 mks)

(c) (i) Name the hormone which is released by the pituitary gland in high concentration on the 14^{th} day of the menstrual cycle (1 mk)

(ii) State two functions of the hormone named in (c) (I) above (2 mks)

(d) State the fertile period during the menstrual cycle (1 mk)

2 A pea plant with round seeds was crossed with a pea plant that had Wrinkled seeds
the gene for round seeds is dominant over that for wrinkled seeds

Using letter R to represent the dominant gene state:

(a) The genotype of parents if plant with round seed was heterozygous (2 mks)

(b) The gametes produced by the round and wrinkled seed parents
Round seed parent

Wrinkled seed parent

(c) The genotype and phenotype of F_1 generation. Show your working (3 mks)

(d) What is a test – cross? (1 mk)

3. The equation below represents a process that takes place in plants
$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

(a) Name the process (1 mk)

(b) State two conditions necessary for the process to take place (2 mks)

(c) State what happens to the end- products of the process (5 mks)

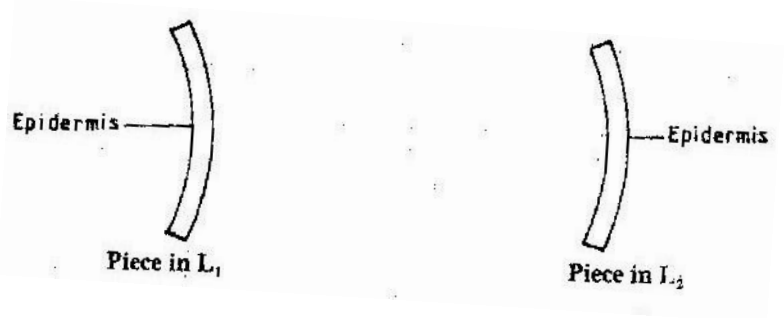
4. (a) Give three reasons in each case why support is necessary in
(i) Plants (3 mks)
(ii) animals (3 mks)

(b) Why is movement necessary in animals (2 mks)

5. A freshly obtained dandelion stem measuring 5 cm long was split lengthwise to obtain two similar pieces

The pieces were placed in solutions of different concentrations in Petri dishes for 20 minutes.

The appearance after 20 minutes is as shown



(a) Account for the appearance of the pieces in solutions L_1 and L_2(6 mks)
(b) State the significance of the biological process involved in the experiment (2 mks)

SECTION B (40 Marks)

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

6. an experiment was carried out to investigate transpiration and absorption of water in sunflower plants in their natural environment with adequate supply of water. The account of water was determined in two hour intervals. The results are as shown in the table below

Time of day	Amounts of water in grammes	
	Transpiration	Absorption
11 00 - 13 00	33	20
13 00 - 15 00	45	30
15 00 - 17 00	52	42
17 00 - 19 00	46	46
19 00 - 21 00	25	32
21 00 - 23 00	16	20
23 00 - 01 00	08	15
01 00 - 03 00	04	11

(a) Using the same axes, plot graphs to show transpiration and absorption of water in grammes against time of the day (7 mks)

(b) At what time of the day was the amount of water the same for transpiration and absorption? (1 mk)

(c) Account for the shape of graph of:

(i) Transpiration (3 mks)

(ii) Absorption (3 mks)

(d) What would happen to transpiration and absorption of water if the experiment was continued till 05 00 hours? (2 mks)

(e) Name two factors that may affect transpiration and absorption at any given time (2 mks)

(f) Explain how the factors you named in (e) above affect transpiration (2 mks)

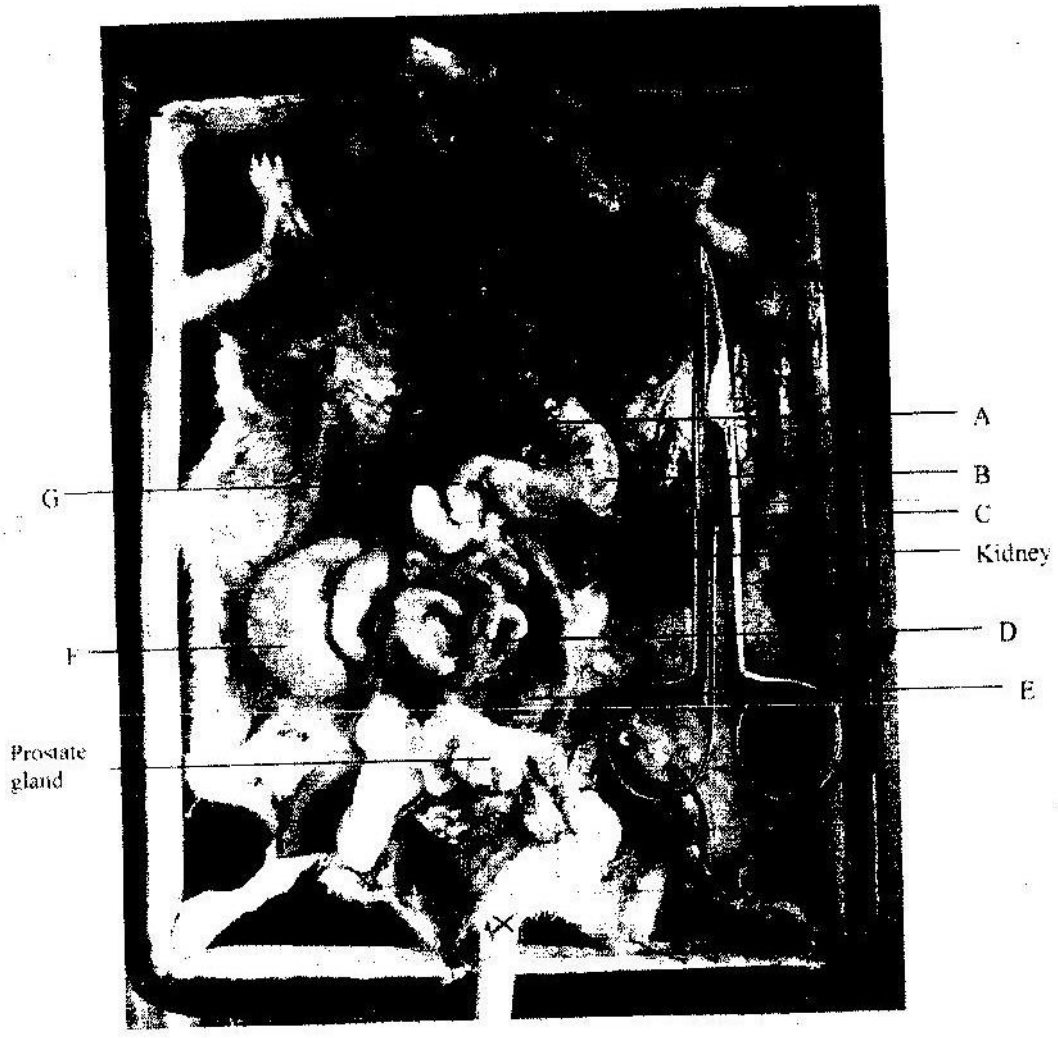
7. Describe the nitrogen cycle (20 mks)

8. (a) State four characteristics of gaseous exchange surfaces (4 mks)

(b) Describe the mechanism of gaseous exchange in a mammal (16 mks)

KCSE BIOLOGY 2008 PAPER 3 QUESTIONS
PRACTICAL

Below is a photograph of a dissected mammal. Examine the photograph



(a) Name the parts labeled A, B, C D and G (5 mks)

(b) State the function of the structures labeled E and F (1 mk)

(c) In the photograph label the structure where vitamin K is produced (1 mk)

(d) (i) Name the sex of the mammal in the photograph (1 mk)
(ii) Give a reason for your answer in (d) (i) above (1 mk)

(e) (i) The actual length of the dissecting scissors in the photographs is 15 cm
Calculate the magnification of the photograph (2 mks)

(ii) Calculate the actual length of the mammal from the tip of the nose to point X on the tail (2 mks)

2. You are provided with substance labeled S,T,U X and Y. S, T and U are food substance. While X is 10% sodium hydroxide solution and Y is 1% copper sulphate solution. Carry out tests to determine the food substance (s) in S. T and U. (9 mks)

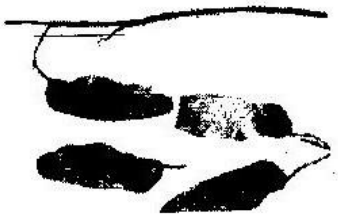
Substance	Food substance being tested for	Procedure	Observations	Conclusion
S				
T				
U				

3. Below are photographs of specimens obtained from plants. Examine the photographs

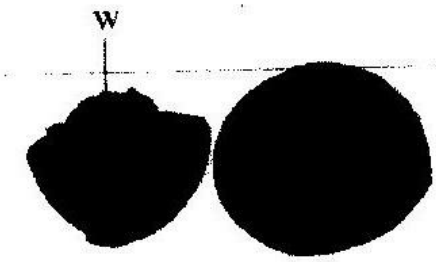
SPECIMEN K

SPECIMEN L

SPECIMEN M



SPECIMEN N



SPECIMEN P

SPECIMEN Q

In the table below name the mode of dispersal and the features that adapt the specimen (s) to that mode of dispersal. (12 mks)

Specimen	Mode of dispersal	Adaptive features
K		
L		
M		
N		
P		
Q		

(a) (i) Label any two parts on specimen L (2 mks)

(ii) State the type of placentaion in specimen L (1 mk)

(b) Name the structure labeled W on specimen P (1 mk)

BIOLOGY PAPER 1 YEAR 2009

1. (a) Name the external feature which is common in birds, fish and reptiles (1 mk)

(b) State two characteristics of fungi (2 mks)

2. Name two befits that a parasite derives from the host (2 mks)

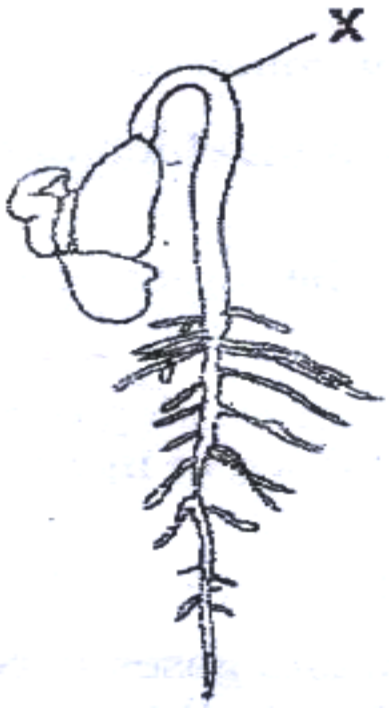
3. State the functions of the following parts of a light microscope (2 mks)

   (a) Objective lens

   (b) Diaphragm

4. (a) The state during which a seed cannot germinate even when conditions for Germination are suitable is called (1 mk)

   (b) The diagram below represents a stage during germination of a seed



   (i) Name the type of germination illustrated in the diagram (1mk)

   (ii) State the role of the part labeled x during germination of the seed (2 mks)

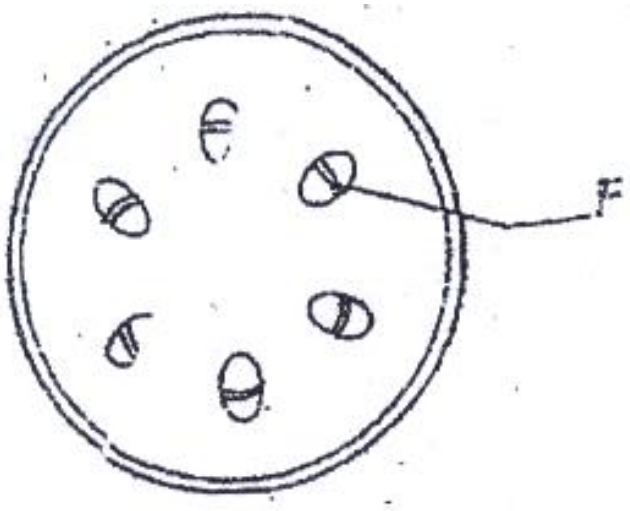
5. (a) What is meant by the following terms

(i) Hybrid vigour (1 mk)

(ii) Polyploidy? (1 mk)

(b) State two causes of chromosomal mutations (2 mks)

6. The diagram below shows a section through a plant organ



(a) (i) Name the class of the plant which the section was obtained (1 mk)

(ii) Give a reason for your answer in (a) (i) above

(b) State the functions of the part labeled F (1 mk)

7. State the function of the following cell organelles

(a) Ribosome (1 mk)

(b) Lysosomes (1 mk)

8. (a) Pregnancies continues if the ovary of an expectant mother is removed after 4 months explain (2 mks)

(b) What is the role of the testes in the mammalian reproductive systems? (2 mks)

9. (a) Name the causative agents of the following diseases in humans (2 mks)

(i) Typhoid

(ii) Amoebic dysentery

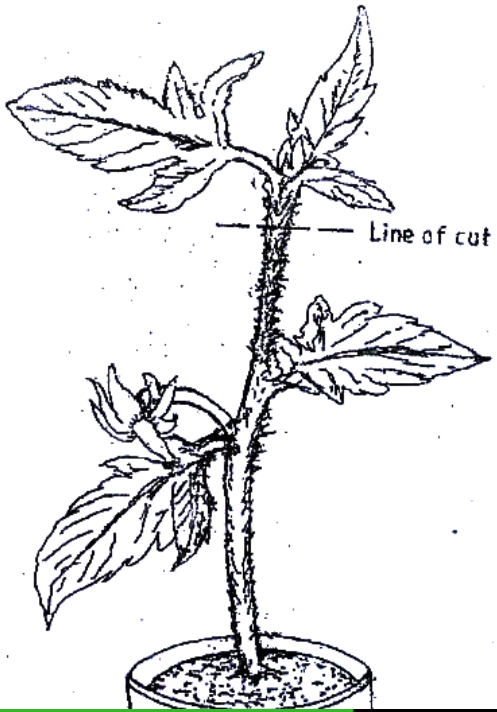
(b) Name the disease in humans caused by plasmodium falciparum (1 mk)

10. (a) (i) What is meant by vestigial structures ? (1 mk)

(ii) Give an example of a vestigial structure in human (1 mk)

(b) Explain why certain drugs become ineffective in curing a disease after many years of use. (2 mks)

11. In an experiment the shoot tip of a young tomato plant was decapitated as

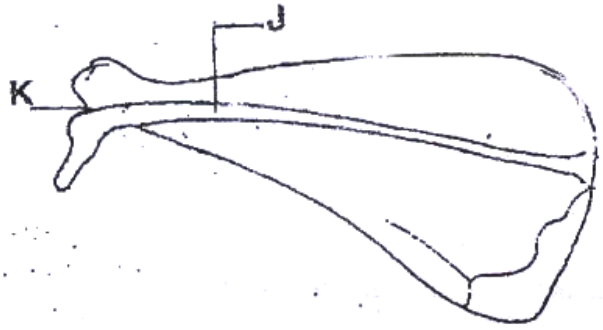


shown in the diagram below

(a) State the expected results after 2 weeks (1 mk)

(b) Give a reason for your answer in (a) above (2 mks)

12. The diagram below represents a bone obtained from a mammal



(a) Name the bone (1 mk)

(b) Name the:

(i) Bone which articulate with the bone named in (a) above at the cavity labeled K; (1 mk)

(ii) Joint formed by the two bones (1 mk)

(c) State the function of the part labeled J (1 mk)

13. (a) Distinguish between diffusion and active transport (2 mks)

(b) State one role that is played by osmosis in (1 mk)

(i) Plants

(ii) Animals

14. Name a support tissue in plants that is not thickened with lignin (1 mk)

15. Name the type of movement that occurs within a plant cell (1 mk)

16. (a) Name the gaseous exchange surface in insects (1 mk)

(b) How is the surface named in (a) above suited to its function (2 mks)

17. Explain why plants do not require specialized excretory organs (4 mks)

18. Explain how the following factors affect the rate of photosynthesis:

(a) Concentration of carbon (iv) oxide (1 mk)

(b) Light intensity (1mk)

19. (a) State three effects of dumping untreated sewage into a river (3 mks)

(b) Name one process that is responsible for loss of energy from one trophic level to the next (1mk)

20. Other than using the quadratic, give two methods of estimating population of grass (2 mks)

21. Explain what happens in humans when concentration of glucose in the blood decreases below the normal level (4 mks)

22. Explain how the carnassials teeth of a dog are adapted to their function (2 mks)

23. state the function of iron in the human body (1 mk)

24. Explain how the following factors determine the daily energy requirement in human:

(a) Age (1 mk)

(b) Occupation (1 mk)

(c) Sex (1 mk)

25. State two ways in which aerenchyma tissues in aquatic plants are adapted to their function (2 mks)

26. How are the mitochondria adapted to their functions? (2 mks)

27. State two ways in which anaerobic respiration is applied in industries (2 mks)

28. (a) State three structural differences between arteries and veins in mammals (3 mks)

(b) Name a disease that causes thickening and hardening of arteries (1 mk)

29. Explain why the rate of transpiration is reduced when humidity is high

BIOLOGY PAPER 2

SECTION A (40 MARKS)

Answer all the questions in this section in the spaces provided

1. When the offspring of purple and white flowered pea plants were crossed, they produced purple and white flowered plants in the ratio of 3: 1

Using letter H to represent the gene for purple colour

(a) State the genotype of:

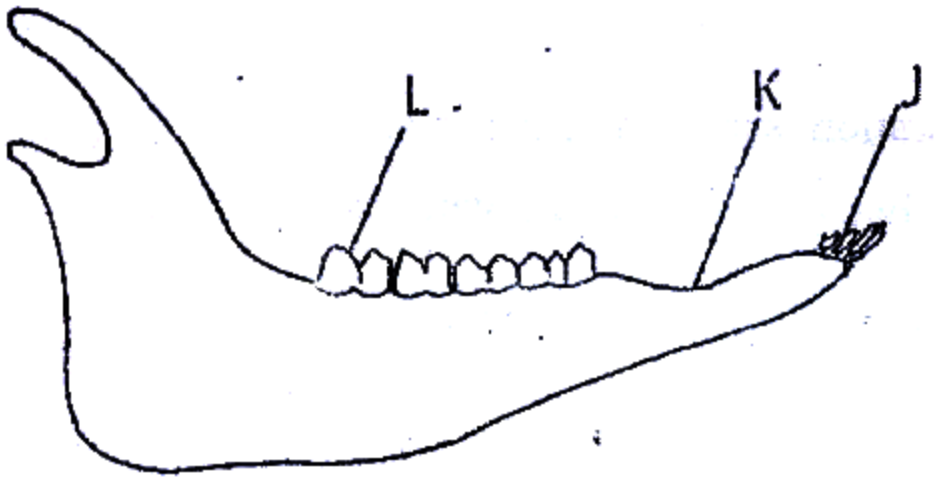
(i) Parents (2 mks)

(ii) F_1 Generation (1 mk)

(b) Work out the cross between plants in the F_1 generation (4 mks)

(c) Account for the colour the flowers in plants of the F_1 generation (1 mk)

2. The diagram below represents the lower jaw of a mammal



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

(b) State one structural and one functional difference between the teeth labeled J and L

Structural (1 mk)

Functional (1 mk)

(c) (i) name the toothless gap labeled K. (1 mk)

(d) Name the substance that is responsible for hardening of teeth (1 mk)

3. (a) what is meant by the term biological control (1 mk)

(i) Give an example of biological control (1 mk)

(b) (i) What is eutrophication? (3 mks)

(ii) What are the effects of eutrophication (3 mks)

(c) Name a substance that is responsible for acid rain (1 mk)

4. (a) (i) Explain the changes that take place in the pupil and iris of a human eye when a person moves from a dark room to a room with bright light (3 mks)

(ii) What is the significance of the changes explained in (a) above (1 mk)

(b) How does the human eye obtain nutrients? (3 mks)

(c) Explain why images that form on the blind spot are not perceived (2 mks)

5. (a) what happens when a wilting young plants is well watered (3 mks)

(b) Name a support tissue in plants thickened with

(i) Cellulose (1 mk)

(ii) Lignin (1 mk)

(c) Give three functions of pectoral and pelvic fins in a fish (3 mks)

SECTION B (40 MARKS)

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

6. An experiment was carried out to investigate the effect of temperature on the rate of reaction catalyzed by an enzyme. The results are shown in the table below

Temperature (^{0}C)	Rate of reaction in mg of products per unit time
5	0.2
10	0.5
15	0.8
20	1.1
25	1.5
30	2.1
35	3.0
40	3.7
45	3.4
50	2.8
55	2.1
60	1.1

On the grid provided draw a graph of rate of reaction against temperature

(6 mks)

(b) When was the rate of reaction 2.6 mg of product per unit time? (2 mks)

(c) Account for the shape of the graph between

(i) 5^0 C and 40^0 C (2 mks)

(ii) 45^0 C and 60^0C (3 mks)

(d) Other than temperature name two ways in which the rate of reaction between 5^0C and 40^0C could be increased (2 mks)

(e) (i) Name one digestive enzymes in the human body which works best in acidic condition (1 mk)

(ii) How is the acidic condition for the enzyme named in (e) (i) above attained?

(2 mks)

(f) The acidic conditions in (e) (ii) above is later neutralized

(i) Where does the neutralization take place?

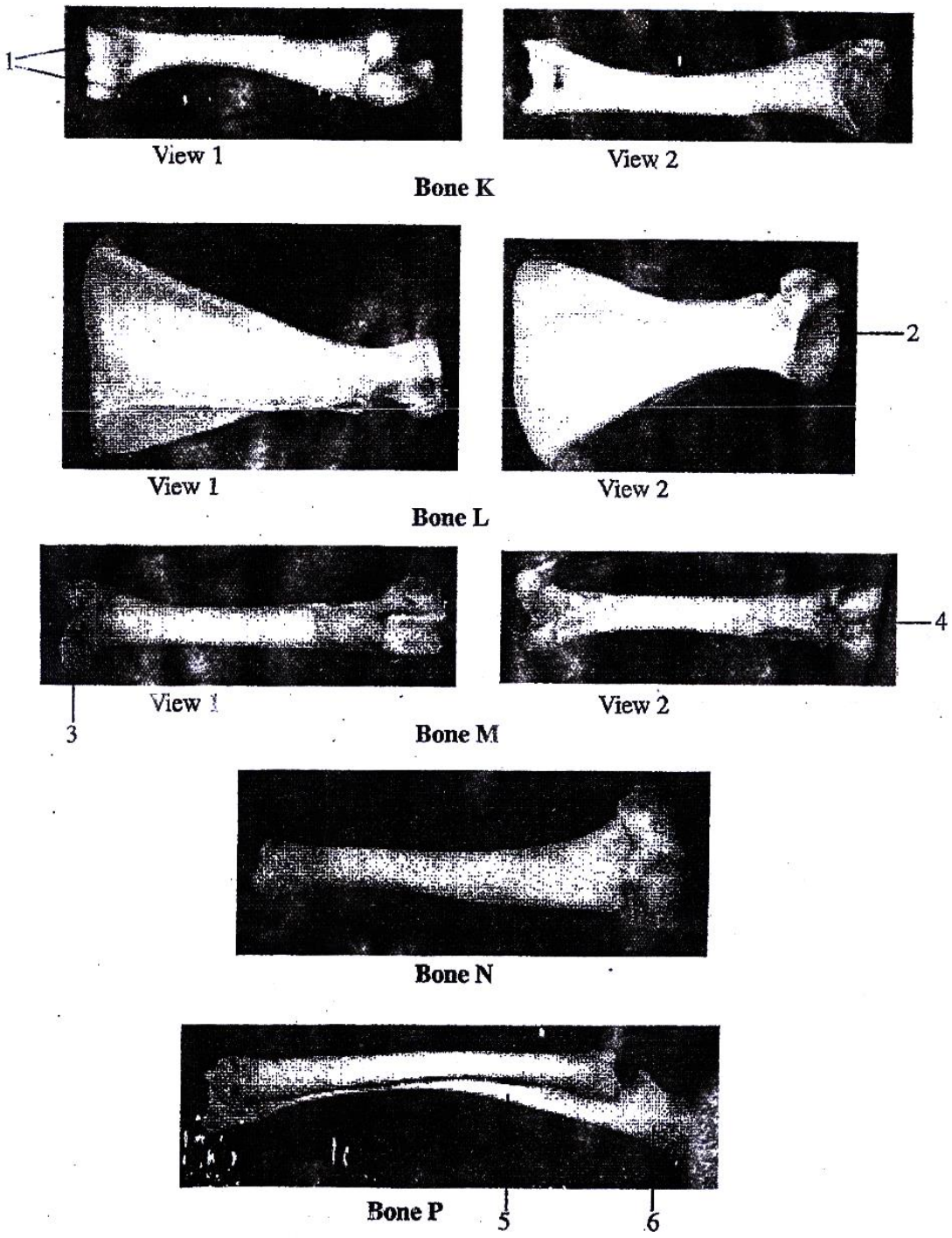
(ii) Name the substance responsible for neutralization (1 mk)

7. How are flowers adapted to wind and insect pollination? (20 mks)

8. Describe the role of the liver in homeostasis in the human body (20 mks)

BIOLOGY PAPER 3

The photographs labeled K L, M, N and P below are of bones obtained from a mammal for each of the bones K, L and M two views are shown



Identify the bones and name the part of the mammalian body from which each was obtained

Body	Identity of the bone	where found
K	……	……..
L	……	……..
M	……	……..
N	……	……..
P	……	……..

Name the parts labeled 1,2,3,4 and 5 (5 mks)

1. ……
2. ……
3. ……
4. ……
5. ……

Name the bones that form a joint with bone K at its anterior and posterior and in each case name the type of joint they form (4 mks)

(i) Bone(s) ……

(ii) Type of joint ……...

Posterior end

(i) Bone (s) ……..

(ii) Type of joint ……..

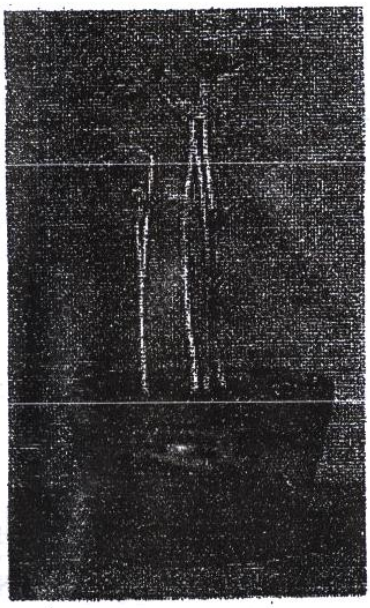
State the function of the structure labeled 6 in bone P (1 mks)

2. You are provided with substances labeled P,Q,X,Y and Z. P and Q are food substances, while X is dilute hydrochloric acid, Y is dilute sodium hydrogen carbonate and Z is Benedict's solution. Carry outs tests to determine the food substance (s) in P and Q. (12 mks)

Substance	Food substances being tested for	Procedure	Observations	Conclusions
P				

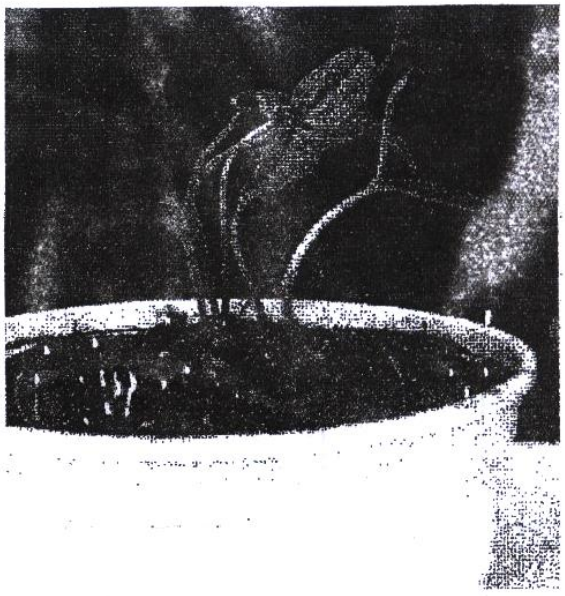
Q				

3. The photographs labeled W, X, Y and Z show seedlings that were grown under different conditions. Examine them



W

X



Using observable features only state three differences between the seedling in photographs W and X (3 mks)

……

……

……

Seedlings in photographs Y and Z were planted at the same time but under different conditions. Explain how the response exhibited by the seedlings in photographs Z occurred. (2 mks)