CHAMPIONS REVISION PUBLISHERS

BIOLOGY SUPER MODELS

MOCKS 2016

Service Beyond expectation

TEL: 0725 733 640 (For this Marking Schemes available separately)

EMAIL:Cger89@gmail.com

FORM 1-4 CONTENT

CHAMPIONS BIOLOGY SUPER MODELS

COMPILED BY CHAMPIONS REVISION PUBLISHERS

TEL: 0725 733 640 FOR MORE MATERIALS AND UPDATED E-MATERIALS AND HARD COPY MATERIALS OF ALL LEVELS

BARINGO COUNTY EDUCATIONAL IMPROVEMENT EXAMINATIONS 2016

(Kenya Certificate of Secondary Education)

BIOLOGY THEORY

Instructions

- Write your name, class and admission number in the space provided above.
- Write the date of the examination and sign in the space provided above.
- Answer ***all*** the questions in the spaces provided.
- You **WILL** be ***penalized*** for wrong spelling especially technical terms.
- Write your answers in **English Language.**

For Examiner's Use Only

Question	Maximum Score	Candidate's Score
1-30	80	

This paper consists of 12 printed pages. Candidates should check the question paper to ascertain that all the pages are printed as indicated and no questions are missing.

1. (a) List **two** professional occupations that require the study of biology. (2mks)

(b). Other than observation, name **one** other scientific skill developed by studying biology. (1mk)

2.(a)Give an example of a sex linked trait in human beings that is linked to the; (2mks)

Y chromosome. ……

X chromosome…….

(b) Write the types of gene mutation represented by the following analogues.

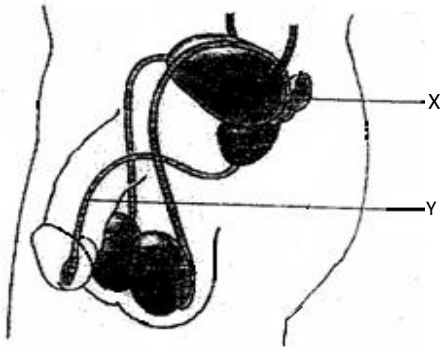
(i) Intended message **BRING THERMOS ON OUTING**
Actual message **BRING MOTHERS ON OUTING**

Type …… (1mk)

(ii) Intended message **PLEASE SAY WHERE YOU ARE**
Actual message **PLEASE STAY WHERE YOU ARE**

Type …… (1mk)

3. The diagram shown below represents a male reproductive system.



(a) Name the structure labelled **X**. (1mk)

(b)Name **one** substances that pass through structure labelled **Y**. (1mk)

4.(a)State the circulatory system found in members of the class Insecta. (1mk)

(b) Name the blood vessels that transport blood from: (2mks)

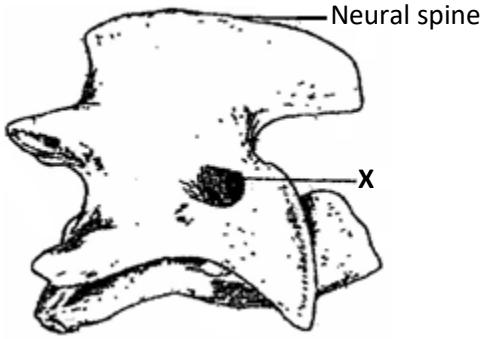
(i)Small intestine to the liver.

(ii)Lungs to the heart.

5.Name **one** enzyme that is secreted in its precursor form. (1mk)

---

6. The diagram below represents a type of bone in the mammalian skeleton.



(a)Identify the bone illustrated in the diagram. (1mk)

(b)Give a reason for your answer in (a) above. (1mk)

---

7. (a)The diameter of the field of view of a light microscopic is 6.5mm. Plant cells lying across the diameter are 12.

(i)Determine the size of one cell in micrometers. (1mk)

(ii) Explain how drooping of leaves on a hot sunny day is advantageous to a plant. (1mk)

(b). A strip of peeled potato whose cell sap concentration was 30 % was placed in a petridish containing 10 % sugar solution.

Account for the observation made after minutes. (1mk)

.....

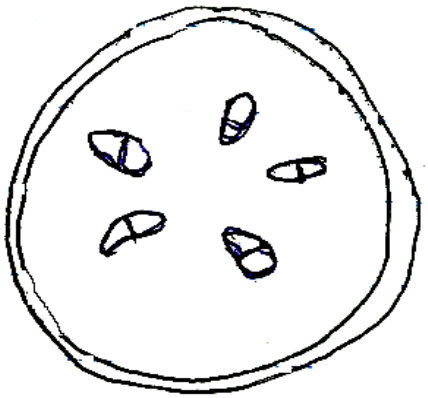
.....

8. (i) Distinguish between a community and a population (1mk)

(ii) State **one** measure that can be taken to control infection of man by protozoan parasites. (1mk)

---

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



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

(ii) Give **one** reason for your answer in (a) above (1 mk)

(b)What is the role of vascular bundles in plant nutrition? (2mks)

---

10. (a) State **one** substance that is taken up by active transport by roots and transported to the rest of the plant parts. (1mk)

(b) Identify **one** product of photosynthesis that is transported to the rest of the parts of the plant. (1mk)

---

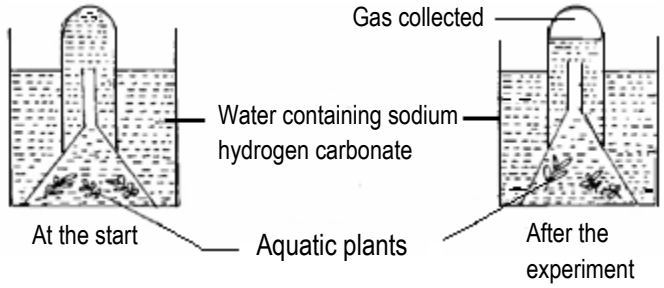
11. (a) Explain why specimens are collected and preserved in specimen bottles. (1mk)

(b) What is binomial nomenclature as used in the naming of living organisms? (1mk)

(c) Give a reason why scientific names are given in Latin. (1mk)

12.(a)Name **two** raw materials for the dark stage process of photosynthesis. (2mks)

(b)The set up shows an experiment to investigate photosynthesis.



(i) What gas was collected in the test tube? (1mk)

(ii)What was the role of sodium hydrogen carbonate in the experiment? (1mk)

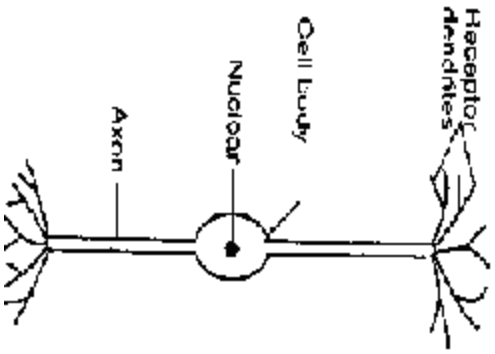
---

13. (a) What is meant by the term gaseous exchange? (1mk)

(b) Explain why respiratory surfaces are moist. (1mk)

---

14. The diagram below shows a specialized human cell.



(a) Name the cell (1mk)

……

(b) **On** the diagram, use an arrow to indicate the direction of impulse transmission (1mk)

15.(a) What is the meaning of the terms (2mks)

(i) Homeostasis

……

(ii) Osmoregulation

……

b) Name the hormones involved in regulation of glucose level in the blood (2mks)

……

……

16. State **two** structural differences between ribonucleic acid (RNA) and deoxyribonucleic acid (DNA). (2mks)

RNA	DNA
(i)	
(ii)	

17. State **three** differences in composition between umbilical artery and umbilical vein. (3 marks)

Umbilical vein	**Umbilical artery**

18. The following is an equation representing a type of respiration

$C_6H_{12}O_6 \longrightarrow 2C_3H_6O_3$ + Energy

(a)Identify the type of respiration. (1mk)

.....

(b) Suggest **one** industrial application of the process named in (a) above. (1mk)

.....

(c) Give the **one** end product of anaerobic respiration in plants. (1mk)

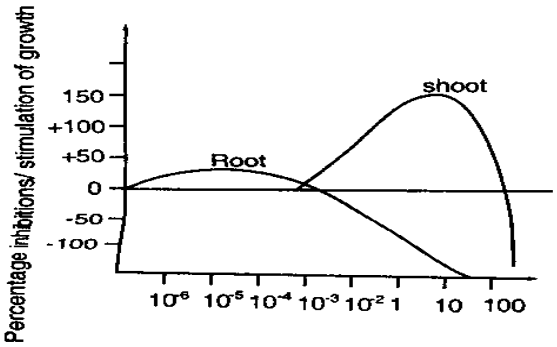
……

……..

19. Name any **one** physiological process in plants that may be affected by dust as a pollutant. (1mk)

……

20. Below is a graphical representation of the effects of different concentration of auxins on shoot and root growth. Study it carefully and then answer the questions that follow.



Auxin concentration (ppm)

(a)Identify **any two** conclusions that can be drawn from the graph. (2mks)

……

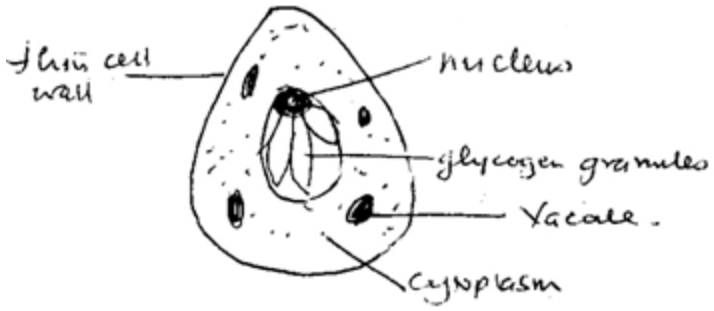
……

……

(b)Name the growth hormone responsible for ripening of fruits. (1mk)

……

21. The figure below shows one of the many moulds known



(a) State the mode of nutrition exhibited by the organism (1mk)

……

(b) Name the kingdom to which it belongs (1mk)

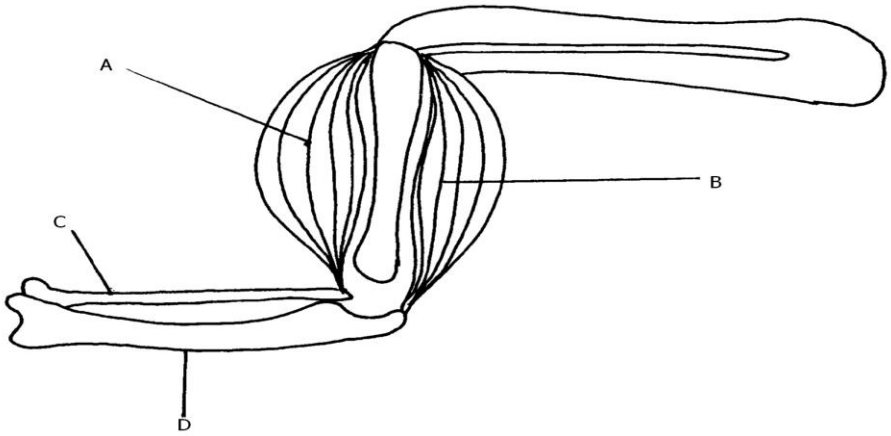
……..…

(c) State one feature common to members of the kingdom named in (b) above (1mk)

……

……..

22. Study the diagram below and then answer the questions that follow:-



(a)Name the bones labeled **C** and **D**. (2mks)

C……

D……

(b)What happens to structure **A** and **B** as the lower arm is straightened (1mk)

23.(a)What is meant by non-disjunction? (1mk)

(b)Give **one** example of a genetic disorder arising from non-disjunction. (1mk)

24.(a)What is seed dormancy? (1mk)

(b)Name a growth inhibitor in seeds (1mk)

……

(c)Differentiate between hypogeal and epigeal germination in seeds (1mk)

……

……

……

……

25. (a) Name **one** photochemical cell in the retina of the human eye that detects low light intensity. (1mk)

……

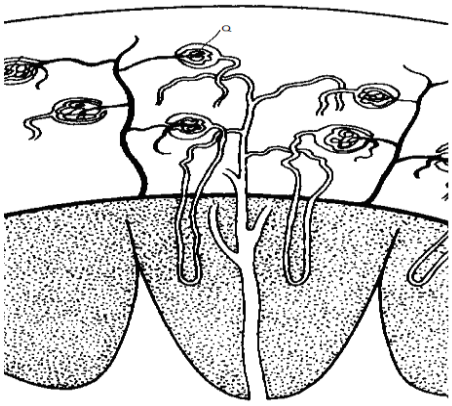
……

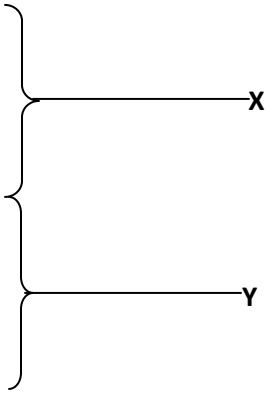
(b) Name **one** chemical substance involved in nerve impulse transmission in mammals (1mk)

……

……

26. The illustration below shows a transverse section through a mammalian kidney.





(a) Name the structures labelled **X** and **Y**.

X…… (1mk)

Y……. (1mk)

(b) State the process in **Q** that leads to the formation of glomerular filtrate. (1mk)

……

……

27.(a)What is meant by the term Genetically Modified Organism(**GMO**)? (1mk)

……

……

……

(b)Name **one** area in Medicine where knowledge of Genetic Engineering has been successfully applied. (1mk)

……

……

……

28. (a) State the view of the theory of organic evolution. (1mk)

……

……

(b) State the weakness in Lamarck's theory of evolution. (1mk)

……

……

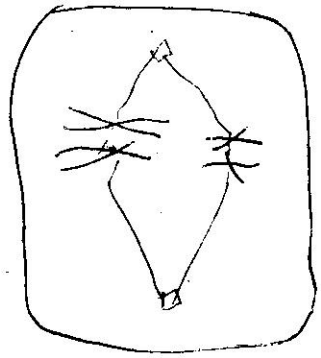
(c) What is adaptive radiation? (1mk)

……

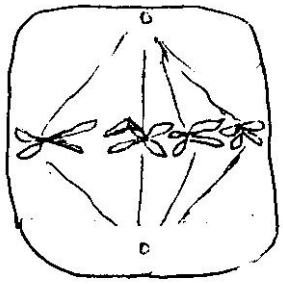
……

……

29. Study the diagrams below and then answer the questions that follow.



A



B

(a) Name the stages **A** and **B** (2mks)

A……..

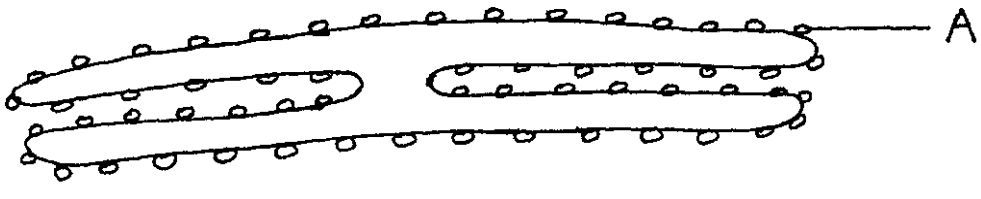
B…….

(b)Give a reason for your answer for **B**. (1mk)

……

……

30. The diagram below shows one of the cell organelles.



(a)Identify the organelle (1mk)

……

(b)Give the function of the part of the organelle marked **A**. (1mk)

……

(c)State **one** structural feature of the cell membrane that gives it strength. (1mk)

……

……

……

231/2
BIOLOGY
Paper 2
(THEORY)
JULY/AUGUST 2016
Time: 2 hours

BARINGO COUNTY EDUCATIONAL
IMPROVEMENT EXAMINATION - 2016
Kenya Certificate of Secondary Education
231/2
Paper 2
BIOLOGY

Instructions to candidates

(a) Write your name and index number in the spaces provided above.
(b) Sign and write the date of the examination in the spaces provided above.
*(c) This paper consists of **two** sections; **A** and **B**.*
*(d) Answer all the questions in section **A** in the spaces provided.*
*(e) In section B answer question **6 (compulsory)** and either question 7 or 8 in the spaces provided after question 8.*
(f) This paper consists of 10 printed pages
(g) Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.
(h) Candidates should answer the questions in English.

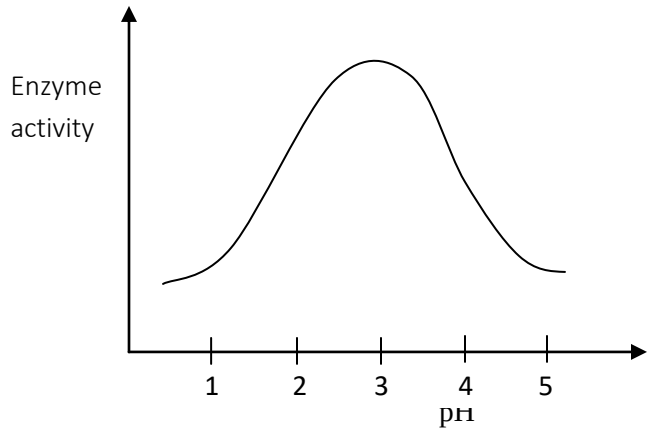
For Examiner's Use only

Section	Question	Maximum Score	Candidate's Score
A	**1**	8	
	2	8	
	3	8	
	4	8	
	5	8	
	6	20	

B	7	20	
	8	20	
Total score		**80**	

SECTION A

1. (a) The figure below shows the effect of pH on an enzyme catalysed reaction.



(i) State the pH at which the enzyme is most active. (1 mark)

.....

(ii) Name ***one*** enzyme likely to be the one in the figure above and suggest the part of the alimentary canal where it is found. (2 marks)

Name -

.....

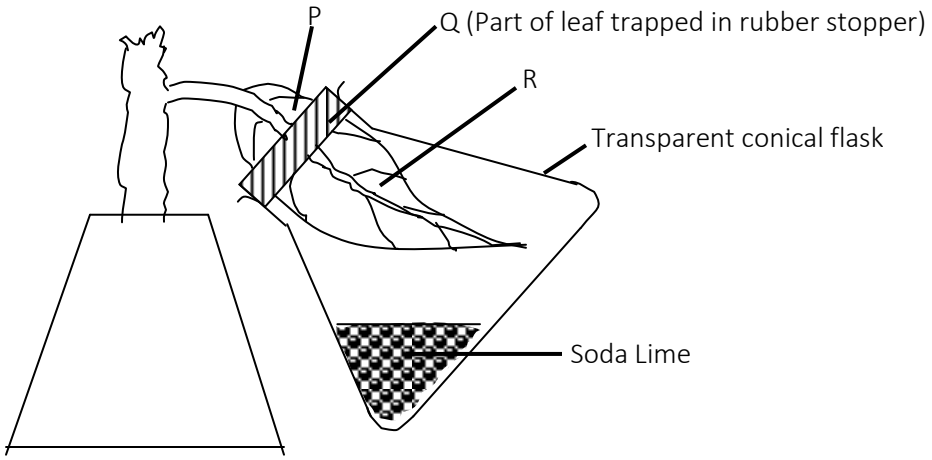
Location in the alimentary canal

.....

(iii) Name the digestive juice that contains the enzyme. (1 mark)

.....

(b) A lass set up the experiment below to investigate some factors necessary for photosynthesis. Study the set up and answer the question that follow.



Before the apparatus were set up in the light, the potted plant was kept in a total darkness for 48 hours.

(i) What was the purpose of keeping in darkness? (1 mark)

.....

(ii) State the colours obtained at the end of the experiment after the leaf was tested for starch. (3 marks)

P -

.....

Q -

.....

R -

.....

2. (a) In an investigation, Snapdragon plants with broad leaves (B) were crossed with plants with narrow leaves (N). The F_1 progeny had intermediate leag breadth.

(i) Give a reason for intermediate leaf breadth in F_1 generation. (1 mark)

.....

(ii) If the plants in the F_1 generation were selfed state the genotypic and phenotypic ratio of the F_2 generation. Use a punnet square to do your working. (5 marks)

(b) State the function of Deoxyribonucleic acid (DNA) molecule. (2 marks)

.....
.....

.....
.....

3. (a) Define the following terms related to evolution and give examples of each. (4 marks)

(i) Homologous structures

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

Examples

.....
.....

(ii)Analogous Structures.....

.....
.....

Examples

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

(b) Explain:

(i) Why an underdose insecticide spraying of mosquitoes may cause a serious problem on this mode of killing mosquitoes using the same spray in future. (2 marks)

.....
.....

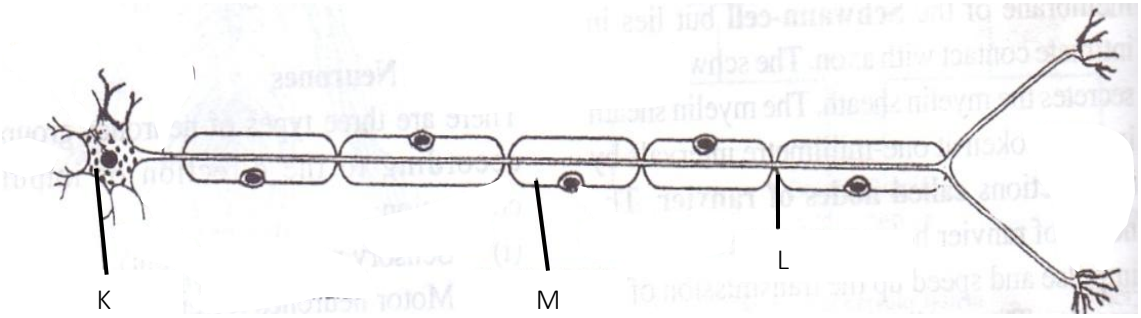
.....

(ii) Why soot on barks of trees due to industrial revolution caused emergence of black melanic moths in a region that originally had white speckled types. (2 marks)

.....

.....

4. The diagram below shows a neurone.



(a) Giving a reason, identify the neurone. (2 marks)

Identify -

.....

Reason -

.....

(b) Name the parts labeled **K, L** and **M**. (3 marks)

K -

.....

L -

.....

M -

.....

(c) State the function of **L**. (1 mark)

.....

.....

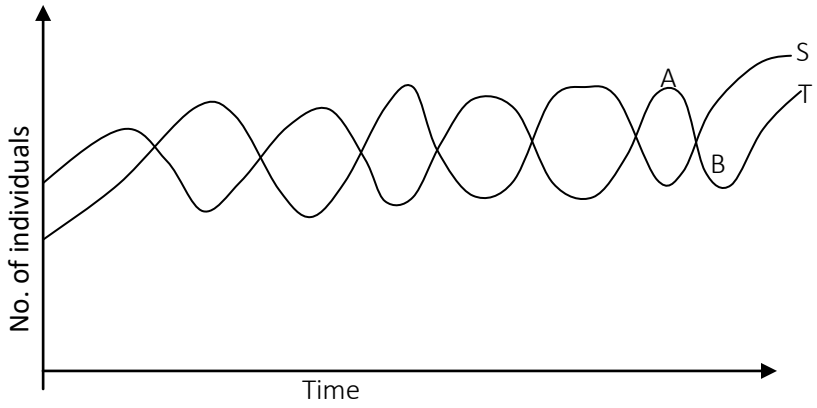
.....

.....

(d) What happens to the muscle on arrival of the impulse. (1 mark)

.....
.....

5. The graph below shows the relationship between the number of herbivores and carnivores in a park.



(a) Identify the curve representing herbivores. Give reasons for your answer. (2 marks)

Identify -

.....

Reason -

.....

.....

(b) Suggest a reason for the slope of curve **S** and **T** between **A** and **B**. (2 marks)

.....
.....

(c) (i) Name the relationship between the two types of organisms as portrayed by the graph. (1 mark)

.....

(ii) State the significance of the relationship you have stated in (i) above. (1 mark)

.....

(d) Describe the long-term effect on the park's ecosystem if the species of the carnivores were to become extinct. (2 marks)

.....
.....

.....

SECTION B.

Answer question 6 ***(COMPULSORY)*** *and either question 7 or 8 in the spaces provided.*

6. An experiment was done to determine the concentration in the blood of two hormones **X** and **Y** produced in the ovaries of a healthy woman aged 30 years within a period of 28 days. The results obtained are shown in the table below.

Time (days)	Concentration of hormone X (arbitrary units)	Concentration of hormone Y (arbitrary units)
2	5	4
4	12	4
6	18	4
8	28	4
10	40	4
12	56	4
14	24	4
16	20	9
18	24	20
20	24	36
22	22	48
24	16	32

26	8	24
28	3	4

(a) Using same axes, plot a graph of the concentration of hormones **X** and **Y** against time. (7 marks)

(b) Suggest the identity of the hormones **X** and **Y.** (2 marks)

X -

.....

Y -

.....

(c) When was the concentration of hormones **X** and **Y** equal? (1 mark)

X -

.....

Y -

.....

(d) Explain the role played by the hormones **X** and **Y** during menstrual cycle. (4 marks)

X -

.....

.....

Y - .....

.....

(e) Briefly describe ***three*** features and mechanisms that hinder self-pollination and self fertilization in plants. (6 marks)

.....

7. Describe the adaptation of finned fish such as Tilapia to locomotion. (20 marks)

8. (a) State ***two*** functions of the mammalian skin. (2 marks)

(b) Describe the structure and function of the mammalian skin. (18 marks)

231/1
BIOLOGY
MAY/JUNE 2016

EKSIKA JOINT EVALUATION TEST
Kenya Certificate of Secondary Education

Instructions

- Write your Name and Index Number in the spaces provided above.
- Write the date of the examination in the space provided above.
- Answer all the questions in the spaces provided.

For Examiner's use only

Question	Maximum Score	Candidate's Score
1-25	80	

This paper consists of 10 printed pages.
Candidates should check the question paper to ascertain that all the pages are printed as indicated and no questions are missing.

1. What name is given to the study of (2mks)
(i) Cells

……
……

(ii) Inheritance and variation
……
……

2. Name the **THREE** end products of anaerobic respiration in plants (3mks)

……
……
……
……

3. a) A student collected an organism and observed the following features: simple eyes, four pairs of legs and two body parts.
(i) State the class to which the organism belongs (1mk)
……
……

(ii) Give an example of an organism in this class (1mk)
……
……

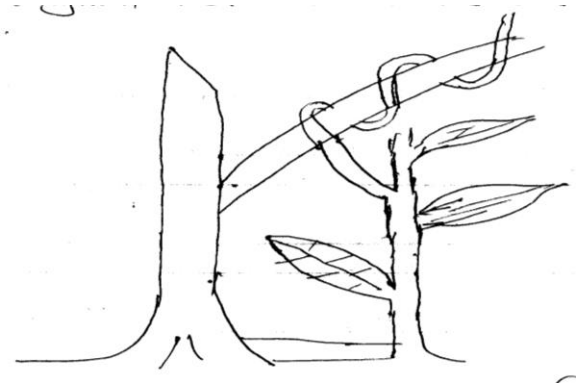
(b) Name the kingdom to which plasmodium belongs (1mk)
……
……

4.(a) Explain continental drift in evolution (3mks)

……
……
……
……

(b) What is meant by the term Organic Evolution (1mk)
……
……

5. The diagram below illustrates a response by a certain plant



(a) Name the type of response (1mk)

……
……

(b) Explain how the response illustrated above occur.(3mks)

……
……
……

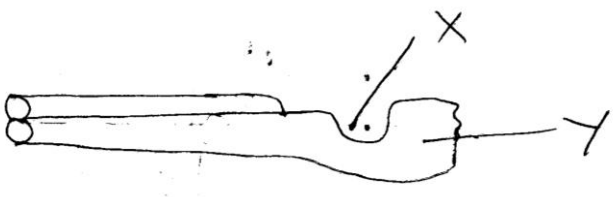
6. a) State two roles of mucus in the stomach (2mks)

……
……
……
……

b) Explain how age determines a person's energy requirements. (2mks)

……
……
……

7. The diagram below represents a bone found in humans



a)(i) identify the bone (1mk)

……
……

(ii) Name the parts labeled X and Y (2mks)

X_____

Y_____

(b) Which bone does it articulate with at the anterior end? (1mk)

……
……

8. A blood transfusion was to be carried out to a patient who was badly injured in a road accident. His plasma contained antibody a.

(a) Name two blood groups who would be donors (2mks)

……
……
……

(b) Explain your answer in (a) above (1mk)

……
……

9. What is the necessity of classifying living organisms (3mks)

……
……

10. Name the organelle that carries out the following functions (3mks)

(i) Transport of proteins

……

(ii) Manufacture of lipids

……

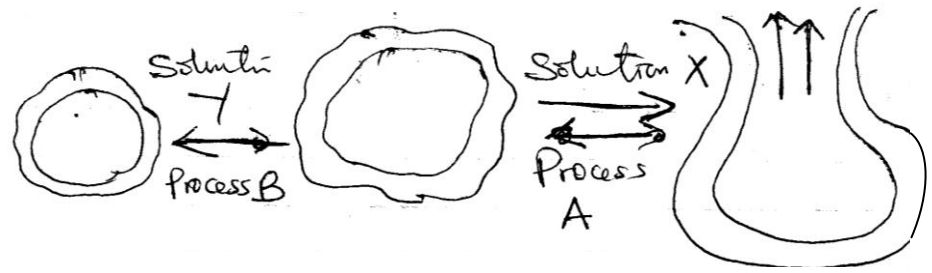
(iii) Destroys worn out tissues and cells

……

11. State ways in which respiratory surfaces are adapted to perform their functions (4mks)

……
……

12. The diagram below illustrates the behaviouir of blood cells placed in two different solutions



(a) Suggest the nature of solution X and Y (2mks)

X_____

Y_____

b) Name the process represented by A and B (2mks)

……
……
……

13 (a) What is meant by the term sex-linked genes? (2mks)

……
……
……

(b) Name any ONE sex-linked trait found on the Y chromosomes in man (1mk)

……

14. In a laboratory test, a person's urine was detected to contain a type of sugar.

(i) Name the type of sugar that was detected (1mk)

……

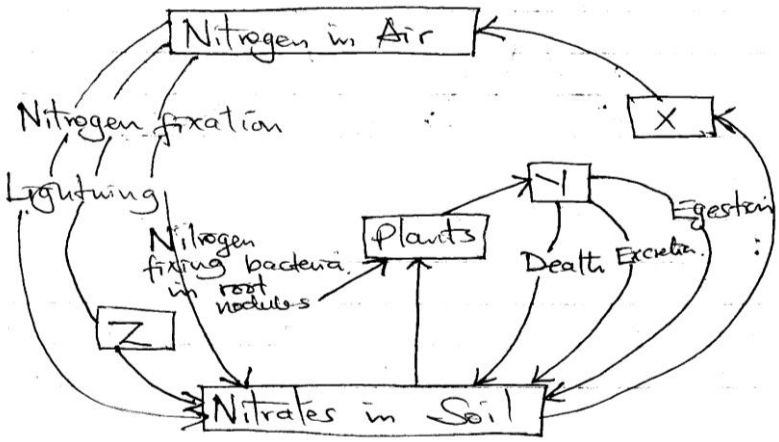
(ii) Name the hormone that was deficient (1mk)

……

(iii) Name the condition, that person was suffering from (1mk)

……

15. The chart below represents a simplified nitrogen cycle



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

X_____

Y_____

Z_____

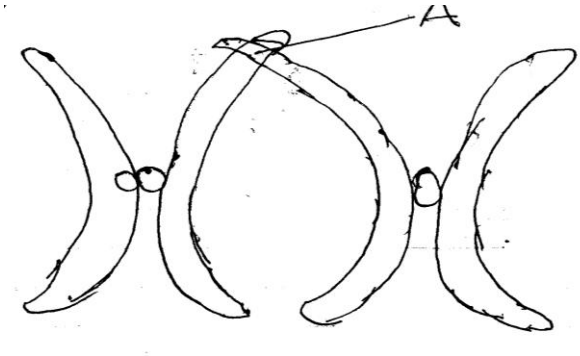
16 (a) Distinguish between epigeal and hypogeal germination (1mk)

……
……

(b) Why is oxygen necessary in the germination of seeds? (1mk)

……
……

17. Below is a diagram showing a pair of chromosomes



(a) Name the process occurring at point A (1mk)

……
……

(b) Give the biological significance of the process named in (a) above (1mk)

……
……

18. Give reasons for carrying out the following procedures when preparing temporary wet mounts of plant tissues

a) Making thin plant sections (1mk)

……
……

b) Adding water on the plant section (1mk)

……
……

c) Placing a cover slip over the plant section (1mk)

……
……

……

19. The scientific name for French bean is Phaseolus vulgaris

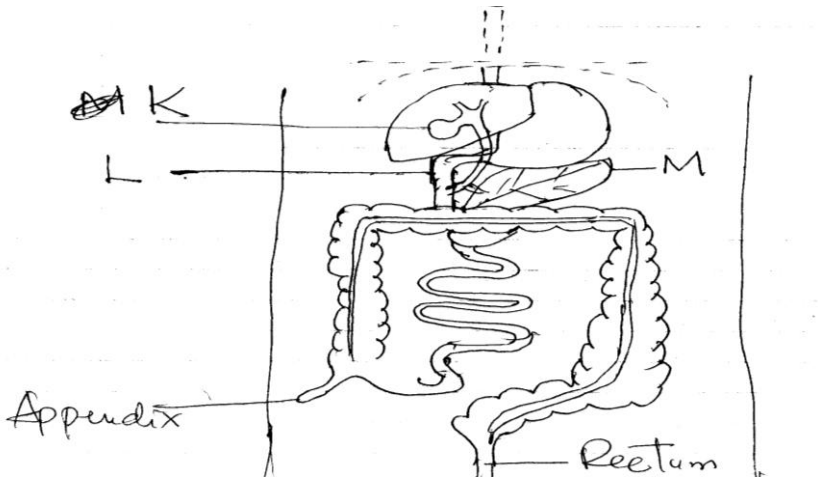
(a) What taxon does the term Phaseolus represent? (1mk)

……
……

(b) State two rules that are followed when giving a scientific name to an organism .(2mks)

……
……
……
……

20. The diagram below represents part of the human digestive system



(a) Name the organs labeled L and M (2mks)

L_____

M_____

(b) (i) Name the substance produced by the organ labeled K (1mk)

……
……

(ii) State the function of substance named in b(i) above (1mk)

……
……

21.(a) Name ONE defect of the circulatory system in humans. (1mk)

……
……

(b) State THREE functions of blood other than transport (3mks)

……
……

22. State the function of the following apparatus used in the collection of specimens.

a) A pooter (1mk)

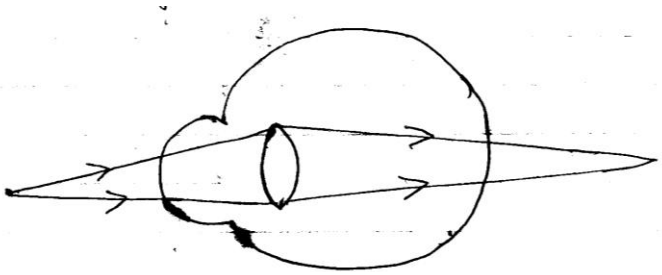
……
……

b) A pit fall trap (1mk)

……

……

23. The diagram below shows the position of an image formed in a defective eye



(a) Name the d (1mk)

……

……

(b) Explain how the defect named in (a) above can be corrected (1mk)

……

……

24. State ONE economic importance of each of the following plant excretory products. (3mks)

(a) Tannin

……

……

(b) Quinine

……

……

(c) Caffeine

……

……

25. Name THREE types of chromosomal mutation (3mks)

……

……

……

……

26. State one example of vestigial structure in humans (1mk)

……

……

……

231/2
BIOLOGY
PAPER 2
THEORY
MAY/JUNE 2016
TIME: 2 HOURS

EKSIKA JOINT EVALUATION TEST
KENYA CERTIFICATE OF SECONDARY EDUCATION
231/2
PAPER 2
BIOLOGY

Instructions To Candidates

a) *Write your name and index number in the spaces provided above.*
b) *Sign and write the date of the examination in the spaces provided above.*
c) *This paper consists of two sections; A and B.*
d) *Answer all the questions in section A in the spaces provided.*
e) *In section B answer questions 6(compulsory) and either question 7 or 8 in the spaces provided after question 8.*
f) *This paper consists of 10 printed pages.*
g) *Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.*
h) *Candidates should answer questions in English.*

For examiners use only

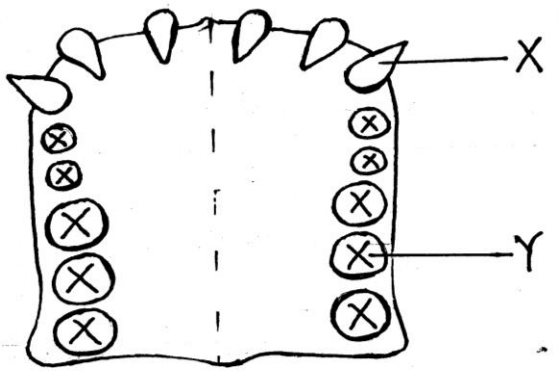
Section	Question	Maximum Score	Candidate's Score
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
B	6	20	
	7 or 8	20	

Total	80	

A

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

1. The diagram bellow shows the arrangement of teeth in the upper jaw of human



a. (i) Write the dental formula (1mk)

(ii) Using the dental formula, determine the total number of teeth (1mk)

b. Name an enzyme involved in digestion in the mouth (1mk)

c. Name the tooth X and Y and state how they are adopted to their functions (4mks)

	Name	Adaptation
X		
Y		

d. Name one dental disease. (1mk)

2. The table below shows some mammalian hormones their sources and function. Fill in the blank spaces a.)

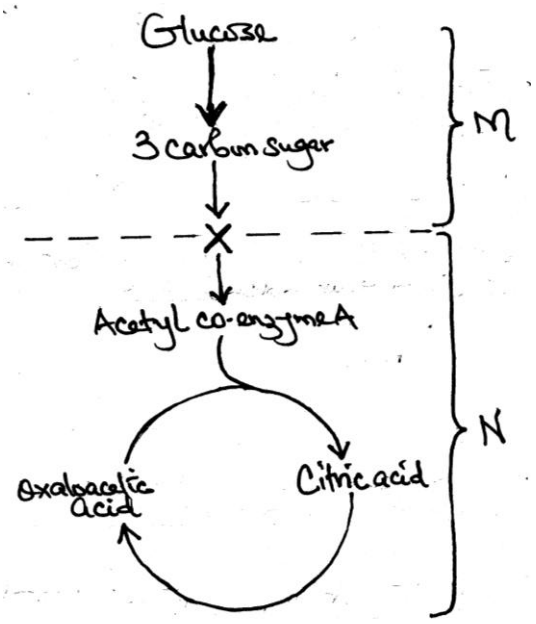
Hormone	Source	Function
Aldosterone	Adrenal gland	
		Stimulate conversion of glycogen to glucose
Anti-diuretic hormone		

(5mks)

b). Explain why glucose is not found in the urine of a healthy person (1mk)

c.) Give two reasons why some plants drop their leaves during the dry season (2mks)

3. The diagram below represents respiration in a cell.



a. (i) Name the process M and N (2mks)

(ii) Name substance X (1mk)

b. In which part of the cell do the following processes occur? (2mks)
M

N

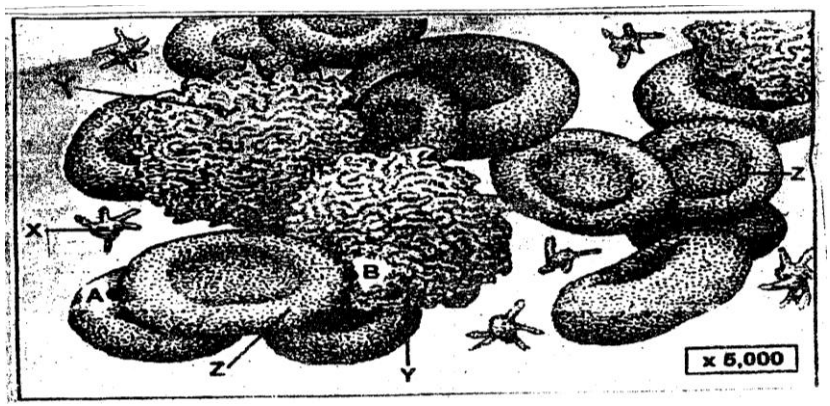
c) The oxidation of a certain fat is represented by the chemical equation shown bellow

$C_5H_{104}O_6+8O_2 \longrightarrow 56CO_2+52H_20+Energy$

Calculate the respiratory quotient (RQ) of the fat (show your working) (2mks)

d. Name the type of alcohol produced by anaerobic respiration in plants (1mk)

4. The photomicrograph represents blood tissue



a) Identify the structure labeled (2mks)
X-

Y-

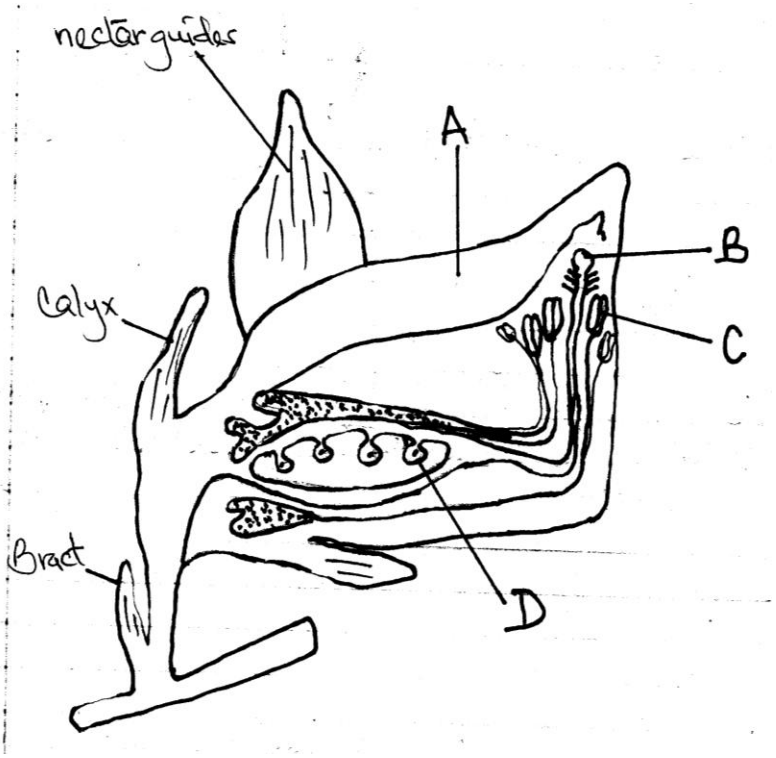
b) State the function of:
X-

Y-

c) Using features on the diagram, state how structure Z is adapted to its function (2mks)

d) On measuring the diameter of structure labeled Z from point A to B in millimeters, the length is 40 mm
Calculate the actual size of structure Z in micrometers (2mks)

5. The diagram below represent a flower of a leguminous plant-crotalaria



a) Name on the diagram the parts labeled A and D (2mks)

b) Give the difference between structures B and C in wind and insect pollinated flowers (2mks)

	Insect pollinated	Wind pollinated
B		
C		

c) State any two changes that will take place in the flower after fertilization (2mks)

d) Classify the Crotalaria plant into the following taxonomic levels (2mks)

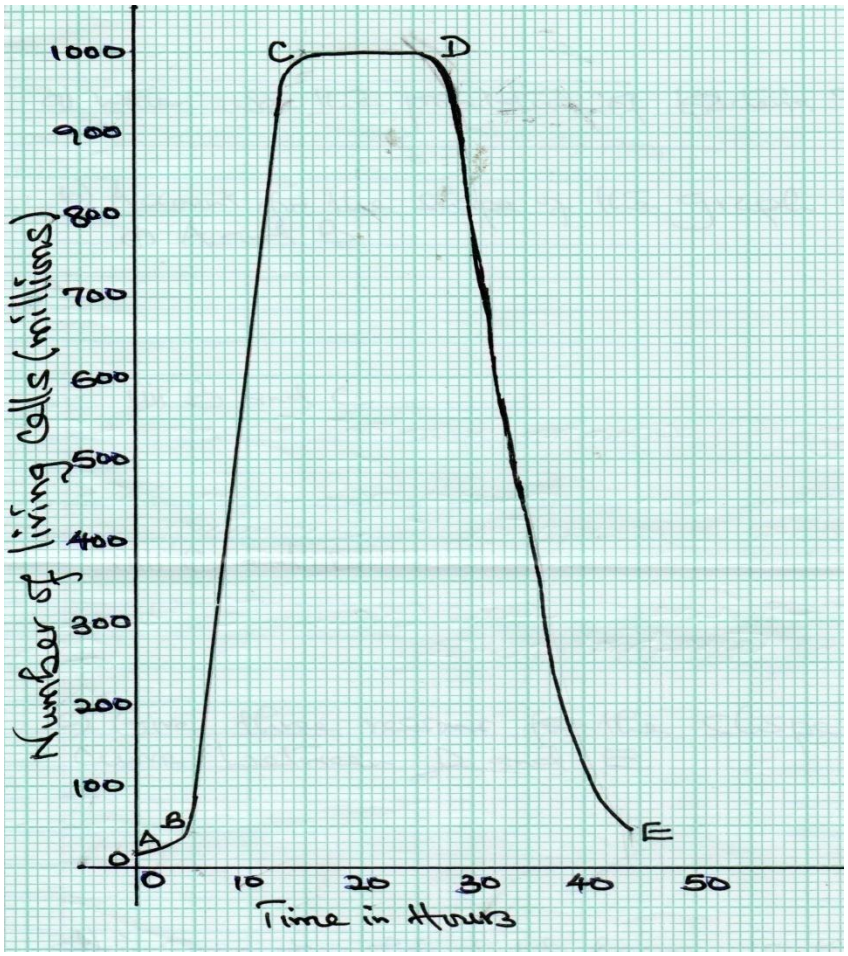
Division:

Class:

SECTION B (40MKS)

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

6. A culture of bacteria was incubated in nutrient agar at 35^0c.samples were take at intervals in order to estimate the number of bacteria in the population. The data obtained is shown in the graph.



a) When was the population of bacteria 750 million? (2mks)

b) Account for the shape of the graph between

(i)A and B (3mks)

(ii)B and C (4mks)

(iii)C and D (2mks)

c) Give three reasons for the slope of the curve between D and E (4mks)

d. (i) Suggest what would happen to the population of the bacteria if the temperature was lowered to 0^0c after incubating for 12 hours (1mk)

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

e) Give three reasons why it is important to control human population growth in Kenya (3mks)

7. (a) Why is locomotion important to animals? (4mks)

(b) Explain how a finned fish such as tilapia is adapted to swimming (16mks)

……

……

8. Describe how gaseous exchange takes place in terrestrial plants (20mks)

231/1
BIOLOGY
THEORY
Paper 1
July/August, 2016
Time: 2 Hours

KAKAMEGA SOUTH SUB-COUNTY JOINT EVALUATION TEST – 2016

Kenya Certificate of Secondary Examination (KCSE)

231/1
BIOLOGY
THEORY
PAPER 1

INSTRUCTIONS TO CANDIDATES

1) Write your name, index number and school in the spaces provided above
2) Sign and write the date of the examination in the spaces provided above
3) Answer ALL the questions in the spaces provided on the question paper
4) Candidates should answer the questions in English

FOR EXAMINER'S USE ONLY

QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
1-27	80	

This paper consists of 10 printed pages Check the Question paper to ensure that all pages are printed as indicated and no question are missing.

1. Name the cell organelles responsible for:

   a) Protein synthesis (1 mk)

   ……

   b) Destroying worn-out organelles and damaged cells (1 mk)

   …….

2. Distinguish between haemolysis and plasmolysis (2 mks)

   ……

   .

3. State three roles of the placenta during pregnancy (3 mks)

   .

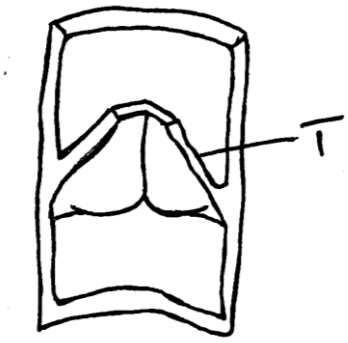
   ……

4. Name two classes of phylum Arthropoda with a cephalothorax (2 mks)

   ……

   .

5. The diagram below represents a blood vessel.



   a) Name the type of vessel (1 mk)

   …….

   b) Identify structure T (1 mk)

   …….

   c) What is the function of structure T (1 mk)

   …….

   …….

6. a) Salivary amylase does not digest starch in the stomach. Give a reason.

   …….

…….

   ……

b) Name any two digestive enzymes secreted by the pancreases (2 mks)

……

……

……

7. State three roles of a fruit in a plant. (1 ½ mks)

……

……

……

8. a) Name the principal site of gaseous exchange in the lungs of humans (I mk)

……

……

b) State two ways in which the structure named in a) above is adapted to its function (2 mks)

……

.

……

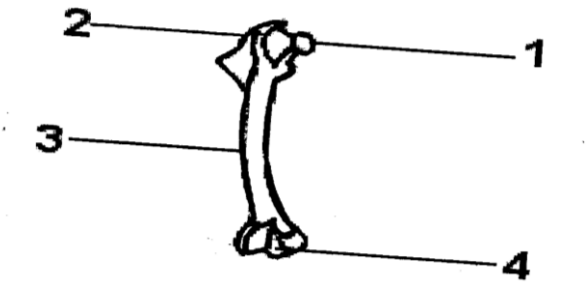
9. Give a reason why water logging favours denitrification (2 mks)

……

……

……

10. The diagram below represents a bone obtained from the hind limb of a goat.



a) Identify the bone (1 mk)

……

b) Name the part labeled 3 (1 mk)

……

c) Name the type of joint formed at the part labeled 4 (1 mk)

……

11. The diameter of the field of view was estimated to be 50mm under a certain magnification. Six cells were observed along the diameter of the field of view. What was the diameter of the cell in Microns (2 mks)

…….

……..

……

12 a) Distinguish between homologous and analogous structures

…….

……..

……

b) Give an example in each case (2 mks)

Homologous structure

…….

……

Analogous structure

……

……

13. Name the types of response shown by the following:

a) Movement of ants away from naphthalene bails (1mk)

……

……

b) Euglena moving near the surface of water (1mk)

……

……

c) Irish potatoes' adventitious roots growing downwards (1 mk)

……

……

14. Hemophilia is a sex-linked characteristic. A normal man married a carrier woman for this characteristic.

a) Using letter H for normal and h for haemophilia, work out the genotype of the offspring .(3mks)

b) What is the probability of one of the sons being haemophiliac? (1 mk)

……

……

15. State three methods by which plants get rid of their excretory wastes. (3 mk)

……

……..

……

16. a) Name two hormones that regulate glucose level in blood. (2 mks)

……

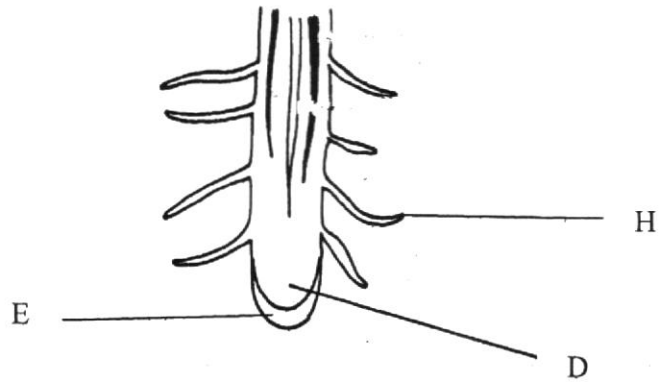
……

b) Name the organ that produces the named hormones above (1 mk)

……

……

17. T he following diagram shows a longitudinal section through a root apex



a) Identify' the parts labeled H and D (2mks)

H…….

.

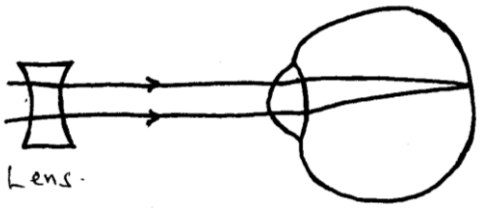
D……

b) State the function of E (1mk)

……

……

18. The diagram below illustrates a certain eye defect



a) Name the eye defect (1 mk)

……

b) i) State one cause of the above eye defect (1 mk)

……

ii) What role does the lens play in the correction of the defect? (2 mks)

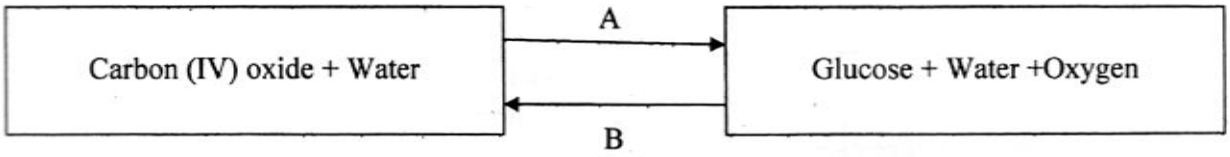
……

……

……

……

19. The scheme below shows two interrelated processes A and B that occur in the same cell.



a) Identified processes A and B

A……

B……

b) Name the organelle where process A takes place (1mk)

……

……

20. The scientific name of a lion, wolf and leopard are Panthera leo, Canis lupus and Panthera padus respectively. All the three belong to the family Carnivora,

a) Which of the organisms are closely related? (1 mk)

……

……

…

b) What does Canis refer to? (1 mk)

……

……

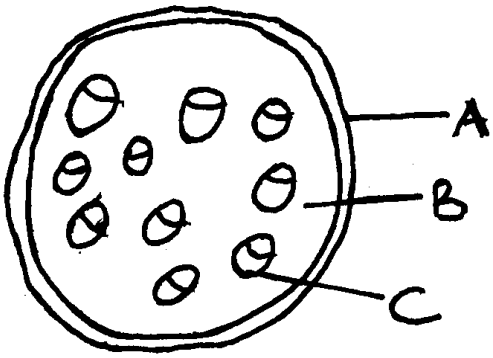
c) Explain why the lion and the leopard cannot procreate (1 mk)

……

……

…

21. Examine the diagram below which has been drawn from a plant section



a) Name the plant organ from which the section was obtained. (1 mk)

……

……

b) Name the parts labeled A and B. (2 mks)

……

……

22. Use the table below to answer the following questions

Material	Plasma Concentration	Glomerular filtrate concentration	Urine Concentration
Proteins	80	0	0
Inorganic ions	7	7	15
Glucose	1	1	0
Urea	0.3	0.3	20
Amino acids	0.5	0.5	0
Uric acid	0.04	0.04	0.5

a) Explain the absence of proteins and glucose in urine. (2 mks)

……

……..……

…

b) One of the symptoms of diabetes mellitus is the presence of glucose in urine. Give the name of this condition. (1mk)

……

……..……

…

c) State the reagent used to test for the presence of glucose in b) above (1mk)

……

……..……

…

23. During the first stage of respiration, a glucose molecule is broken down to yield a small amount of energy

a) What name is given to this process? (1mk)

……

……..……

…

b) State where the process takes place in the cell (1mk)

……..……

……

24. Name the branch of Biology that deals with the study of ;

a) Insects (1mk)

……..……

……

b) Fungi (1mk)

……

……..……

…

c) Parasites

……

……..……

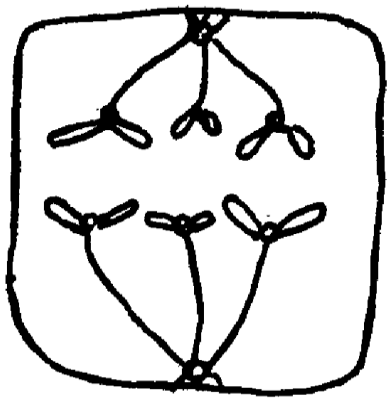
…

25. List down three support tissues in old dicotyledonous plants. (3mk)

……

……

26. The diagram below shows a cell undergoing a stage in cell division



a) Identify the stage (1 mk)

……

……..……..

b) Give a reason for your answer in a) above (1 mk)

……

……..……

…

c) Draw a diagram to show the next stage of the cell division (2 mk)

27. Name the organism that:

a) Causes malaria

……

……..……

…

b) Transmits malaria (1mk)

……

……..……

…

231/2
BIOLOGY
THEORY
Paper 2
July/August, 2016
Time: 2 Hours

KAKAMEGA SOUTH SUB-COUNTY JOINT EVALUATION TEST – 2016

Kenya Certificate of Secondary Examination (KCSE)

231/2
BIOLOGY
THEORY
Paper 2

INSTRUCTIONS TO CANDIDATES

1. Write your name, index number and school in the spaces provided
2. Sign and write the date the examination was done in the spaces provided
3. This paper consists of two sections, section A and section B. Answer ALL the questions in section A in the spaces provided on the question paper. In section B, answer question 8
4. (compulsory) and either question 7 or 8 in the spaces provided after question 8
5. Be brief and precise. Unnecessary information and wrong spellings especially of technical terms shall be penalized
6. This paper consists of 8 questions on 8 printed pages. Candidates are advised to check the question paper carefully to ensure that all the pages are printed as indicated and no questions are missing
7. All answers must be written in the English language

FOR EXAMINER'S USE ONLY

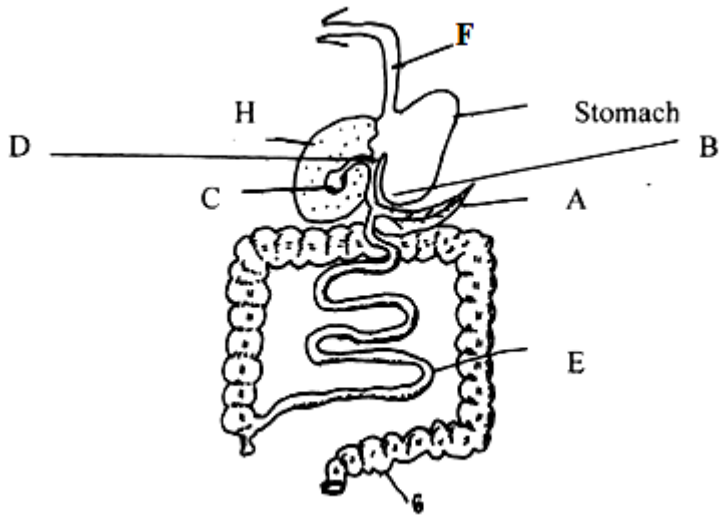
QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
1-27	80	

This paper consists of 8 printed pages Check the Question paper to ensure that all pages are printed as indicated and no question are missing.

SECTION A (40 MKS)

Answer ALL the questions in this section in the spaces provided on the question paper.

1. The diagram below shows part of the mammalian digestive system



a) Name the parts labeled A, B and D (3 mks)

A…….

B

……..

D…….

b) State the functions of the parts labeled C and E (2 mks)

C……

F……

c) What are the adaptations of the stomach to its function (2 mks)

……

……

d) Name a deficiency disease resulting from lack of proteins in the diet (1mk)

……

2. a) What is diffusion? (1mk)

……

……

b) How do the following factors affect the rate of diffusion?

i) Diffusion gradient (1 mk)

……

……

ii) Surface area to volume ratio (1 mk)

……

……

iii) Temperature (1 mk)

……

……

c) Outline four roles of active transport in the human body (4 mks)

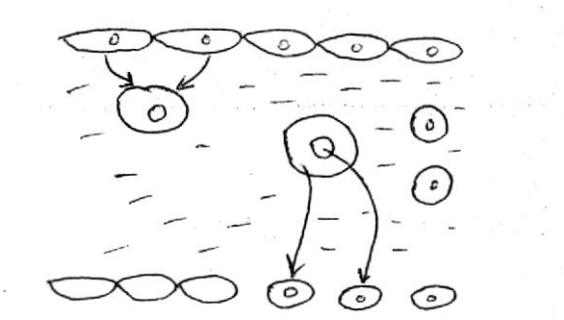
……

……

……

……

3. Use the diagram below to answer the questions that follow.



a) Name the gas that diffuses

i) To the body cells (1 mk)

……

ii) From the body cells (1mk)

……

b) Which compound dissociates to release the gas mentioned in a) ii) above? (1 mk)

……

c) i) What is tissue fluid? (2 mks)

……

……

ii) What is the importance of tissue fluid? (1 mk)

……

……

d) Name the blood vessel (s) in the human body with the highest concentration of:

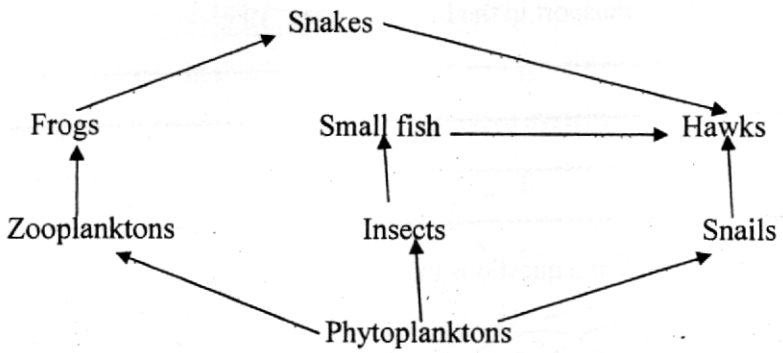
i) Glucose after a meal rich in carbohydrates. (1 mk)

……

ii) Carbon (IV) oxide. (1 mk)

……

4. The flow chart below shows a feeding relationship in an aquatic ecosystem



a) Name the:

i) Producers in this ecosystem (1mk)

……

ii) Organisms that occupies the highest trophic level (1mk)

……

b) Write a food chain that ends with the hawk as a secondary consumer (1mk)

……

……

c) If all the frogs died, state two short-term effects on this ecosystem. (2mks)

……

……

d) Oil spills on water bodies leading to the death of fish. Explain. (2 mks)

……

……

e) Give one other cause of water pollution other than oil spills. (I mk)

……

……

5. Black colour is due to a dominant gene in rats. Two black rats were crossed and their F_1, generation was in the ratio of 3 black: 1 white. Using letter B to represent the gene for black colour and b for white colour, give the:

a) i) Genotypes of the parents. (2 mks)

……

……

ii) Gametes of the parents (2 mks)

……

……

iii) Genotypic ratio of the F1 generation (3 mks)

……

……

b) What is meant by the term test cross as used in genetics? (1 mk)

……

……

SECTION B(40 MKS)

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

6. An experiment was carried out to investigate the population growth of rats in a laboratory. Twenty young rats were placed in cage. The amount of food available to the rats each day was kept constant. The results obtained are shown in the following table

Time in Months	0	2	4	6	8	10	12	14	16	18
Number of Rats	20	20	65	115	310	410	390	190	145	160

a) Using the grid provided on page 6, draw a graph of the number of rats against time. 6 mks)

b) With reference to the graph, account for the changes in the population of rats between:

1) 0 to 2 months (2 mks)

……

……

ii) 2 to 10 months (2mks)

……

……

c) Between which two months was the population change greatest. (1 mk)

……

d) Calculate the rate of population change over the period you have mentioned in c) above. (3 mks)

……

……

……

e) What population changes would be expected if the investigation was continued for a further 24 months. (2 mks)

……

……

f) State four factors that would cause rapid human population growth . (4 mks)

……

……

……

7. Describe the adaptations of the human skin to its functions. (20 mks)

8. a) Define evolution (2mk)

b) Discuss the various evidences of organic evolution (18 mks)

……

231/1

BIOLOGY

PAPER 1

JUNE 2016

TIME: 2 HOURS

KASSU JOINT EXAMINATION

***Kenya Certificate of Secondary Education (K.C.S.E.)*Biology**

Paper 1

INSTRUCTIONS TO CANDIDATES:

- *Write your **name** and **index number** in the spaces provided.*
- *Sign and write **date** of examination in the spaces provided above*
- *Answer **all** the questions in the spaces provided;*

For Examiner's Use Only:

QUESTIONS	MAXIMUM SCORE	CANDIDATES SCORE
1- 30	80	

This paper consists of 8 printed pages. Candidates should check to ascertain that all papers are printed as indicated and that no questions are missing

1. State the function(s) of the following cell structures during cell division. (2mks)

(i) Centriole

……..…
……

(ii) Centromere

……..…
……

2. (a) State the function of co-factors in cell metabolism. (1mk)

……..…
……

(b) Give **one** example of a metabolic co-factor. (1mk)

……..…
……

3. Industrial wastes may contain metabolic pollutants. State how such pollutants may indirectly reach

and accumulate in the human body if the wastes were dumped into rivers. (3mks)

……..…
……...……

……...
….

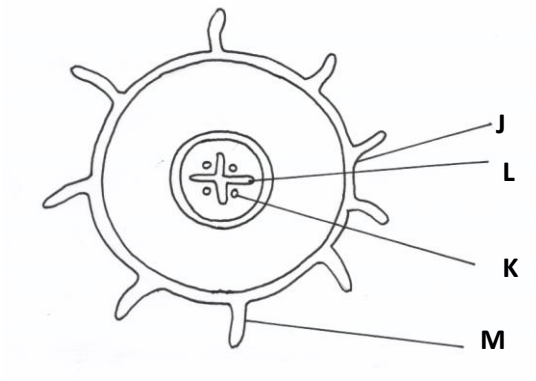
4. In an investigation the pancreatic duct of a mammal was blocked. It was found that the blood sugar

regulation remained normal while , food digestion was impaired. Explain these observations.(2mks)

……..…

……...….

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



(a) From which plant organ was the section obtained. (1mk)

……..…

……

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

……..…

……

……....

….

6. State **two** structural differences between ribonucleic acid(RNA) and deoxyribonucleic acid (DNA). (2mks)

	RNA	DNA
(i)		
(ii)		

7. (a) Explain why glucose does not appear in urine of a healthy person even though it is filtered in the

Bowman's capsule of a mammal. (2mks)

……..…

(b) In a certain person, glucose appeared in urine. State the disease the person was suffering from. (1mk)

……

……....

8. State the stage in cell division in which the following events occurs:-

(i) Replication of the genetic material. (1mk)

……..…

……

(ii) Exchange of genetic material (1mk)

……..…

……

9. In a blood test, a few drops of anti-B serum were added to two samples of blood. It was noted that agglutination occurred. What were the possible blood groups of the two blood samples. (2mks)

……..…

……

……....

….

10. Explain what would happen when a marine amoeba is transferred to a fresh water environment.

(3mks)

……..…

11. A small amount of chemical M was put on one side of maize celeoptiles. After some days, it was noted that the celeoptiles curved away from the side to which the chemical was applied.

(a) Suggest the possible identity of chemical substance M (1mk)

……..…

(b) Explain how this chemical might have caused the celeoptiles to curve. (2mks)

……..…

……...….

……..…

12. Name the division of the Kingdom plantae with the following spore producing bodies. (2mks)

(i) Sori

……..…

(ii) Capsule

……..…

13. (a) Name two fins in a bony fish which perform the following functions:-

Changing direction, control pitching. (2mks)

……..…

……....

(b) State the role of the swim bladder in a fish. (1mk)

……..

14. (a) In which part of the spinal cord is the cell body of the motor neurone found. (1mk)

……..…

(b) Below are two features which make a neurone a specialised cell. State their roles. (2mks)

(i) Axon.

……..…

(ii) Dendrites.

……..…

15. (a) What is a natural selection? (1mk)

……..…

(b)Distinguish between convergent and divergent evolution. (1mk)

……..…

……....

16. (a) Explain how the following parts of a mammalian reproductive system are adapted to their functions. (2mks)

(i) Testis

……..…

(ii) Uterus

……..…

(b) Explain why removal of the ovary after four months of pregnancy does not terminate pregnancy. (1mk)

……..…

17. Active yeast cells were added to a dilute sugar solution in a container. The mixture was kept in a warm room. After a few hours bubbles of gas were observed escaping from the mixture.

(a)Write an equation to represent the chemical reaction above. (1mk)

(b) What is the economic importance of this type of chemical reaction in industry. (1mk)

……..

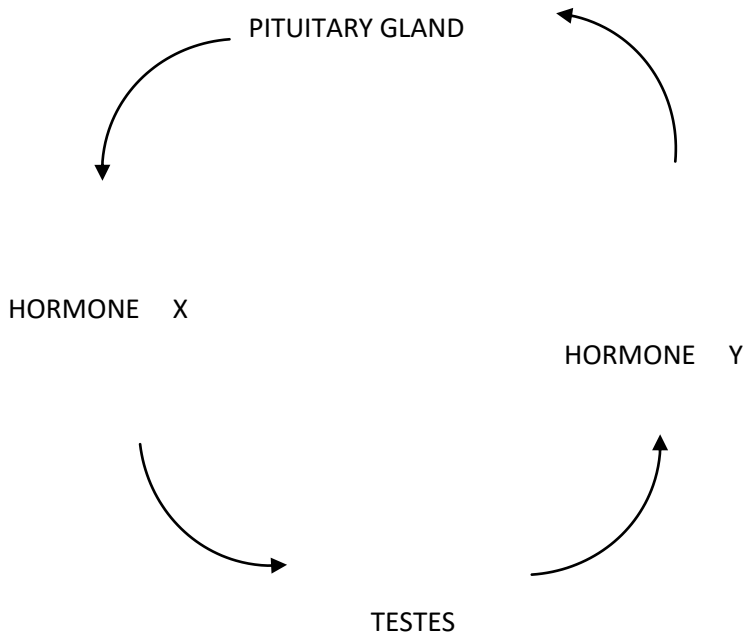
……

18. What are the functions of the odontoid process found on the axis bone of the cervical vertebra.

(2mks)

……...

19. The diagram below represents a simple endocrine feedback mechanism in a human male.



(a) Name the hormone labeled **X** (1mk)

……..…

(b) State **two** differences that may be observed between a normal male and one who is incapable of producing hormone labeled **Y** (2mks)

……..……

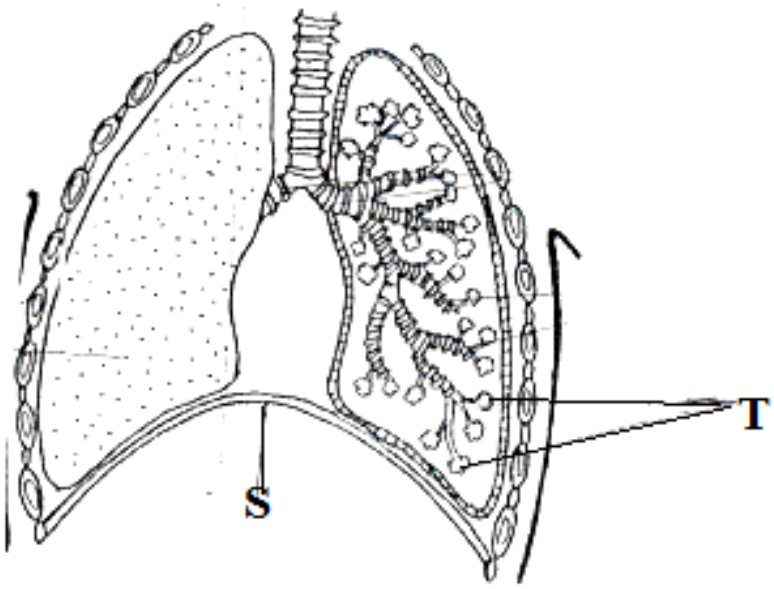
20. (a) What is meant by double fertilization in flowering plants? (2mks)

……..…
……

(b) State **two** advantages of cross pollination in a flowering plant. (2mks)

…….....
.

21. The diagram below shows part of a mammalian respiratory system.



(a) Explain **two** ways in which the part labeled T is adapted to its functions. (2mks)

……..…

……....

……..…

……..…

(b) How does the part labeled S facilitate breathing in? (2mks)

……..…

22. Define the term alleles. (1mk)

……..…

……

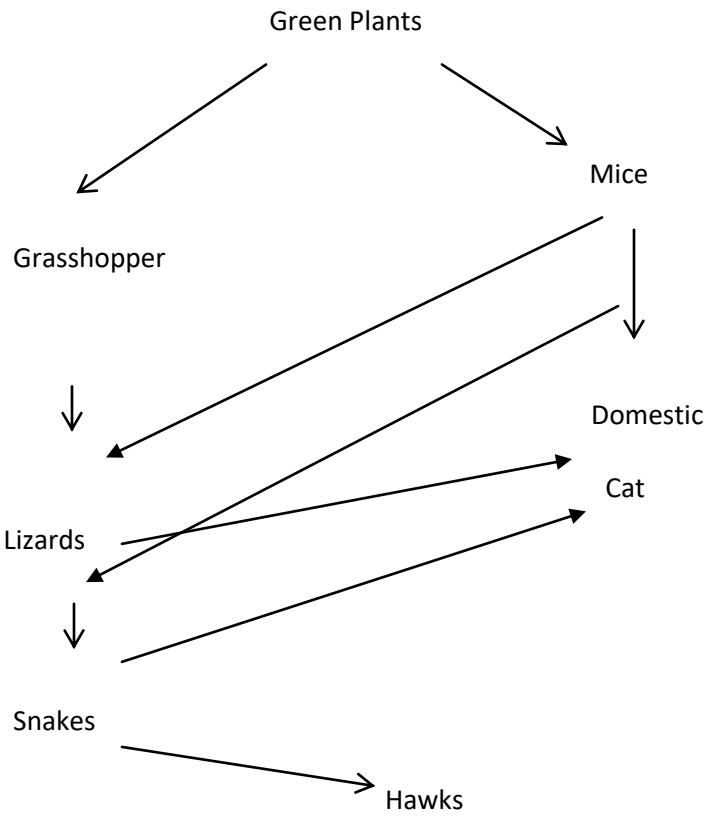
23. (a) Explain why the body temperature of a healthy human being must rise upto 39^{o}C on humid day. (2mks)

……..……

(b) In an experiment a piece of brain was removed from a rat. It was found that the rat had large fluctuations of body temperature. Suggest the part of the brain that had been removed. (1mk)

……..

24. The chart below shows a feeding relationship in a certain ecosystem.



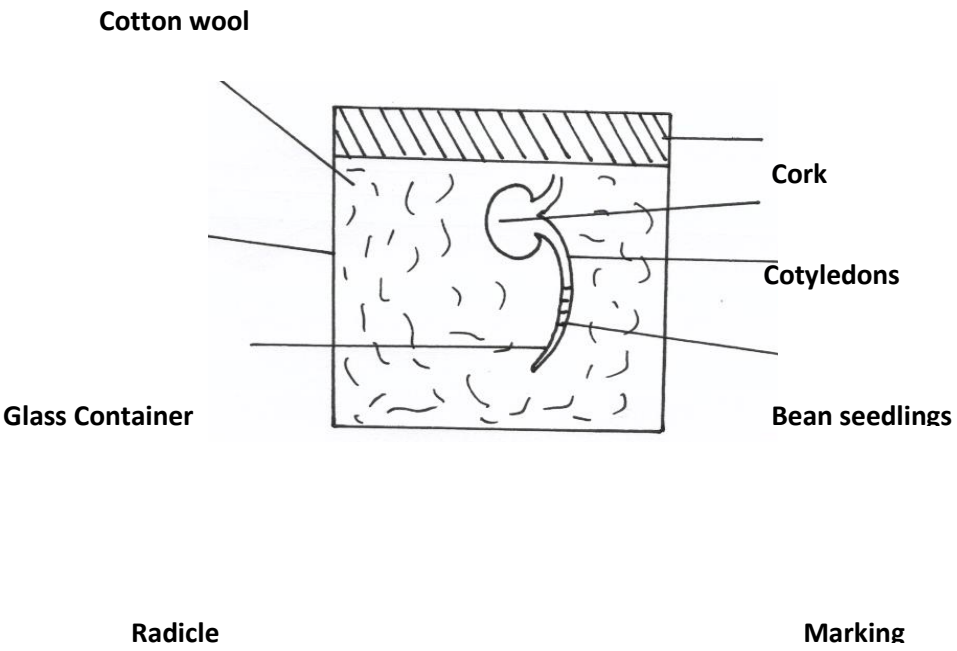
(a) Construct the food chains ending with a tertiary consumer in each case. (2mks)

(b) Suggest **three** ways in which the ecosystem would be affected if there was prolonged drought. (3mks)

…...….

……..…
……

25. A student set up an experiment as shown in the diagram below.



AT THE START

(a) (i) What was being investigated in the experiment? (1mk)

……..……

(ii) Draw a diagram to indicate the expected results of the experiment after three days. (1mk)

(iii) Why was it necessary to have wet cotton wool in the container (1mk)

……..…

……...

(b) What is the role of the following in a germinating seed.

(i) Oxygen (1mk)

……..

(ii) Cotyledons (1mk)

……..

26. Give a reason why it its only mutations in genes of gametes that influence evolution. (1mk)

……..…

……...

27. A person was able to read a book clearly at arms length, but not at normal distance.

(a) State the eye defect the person suffered from. (1mk)

……..…

……....

(b) Why was he unable to read the book clearly at normal distance. (1mk)

……..…

……....

(c) How can the defect be corrected. (1mk)

……..

……....

28 Some form three students took a germinating maize grain and placed it in a starch paste in a petri dish and put the Petri dish in a water bath maintained at 30^oC. After 48 hours the starch paste was irrigated with iodine solution .The area around the maize grain changed to the colour of iodine solution while the rest turned blue –black.

(a) Account for the observation (2mks)

……..…

……...….

(b) Why was the Petri dish put in a water bath maintained at 30^oC? (1mk)

……...….

29. State **two** functions of muscles found in the alimentary canal of mammals. (2mks)

……...….

30. Explain **two** ways in which xylem vesseles are adapted to their function. (2mks)

……..…

……..……

……....

….

231/2
BIOLOGY
PAPER 2
JUNE 2016
TIME: 2 HOURS

KASSU JET EXAMINATION

Kenya Certificate of Secondary Education (K.C.S.E.) 2016

Biology
Paper 2
INSTRUCTIONS TO CANDIDATES:

- *Write **your name** and **index number** in the spaces provided.*
- *Answer **all** the questions in Section **A** in the spaces provided.*
- *In section **B** answer questions **6** (compulsory) and either question **7** or **8** in the spaces provided*

For Examiner's Use Only:

SECTION	QUESTIONS	MAXIMUM SCORE	CANDIDATES SCORE
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
B	6	20	
	7	20	
	8	20	
	TOTAL	**80**	

This paper consists of 10 printed pages. Candidates should check to ascertain that all papers are printed as indicated and that no questions are missing

SECTION A (40 MARKS)

Answer all the questions in this section in the spaces provided

1. A couple has three children, the mother had **blood group A** and the father had **blood group B** while one of the children had **blood group 0.**

(a) (i) **What** were the genotypes of the parents? (1mark)

Father

……
…

Mother

……
…

(ii) What was the genotype of the child with blood **group 0?** (1mark)

……
…

(b) **Work out** using a **punnet** square the genotypes of the other children. (4 marks)

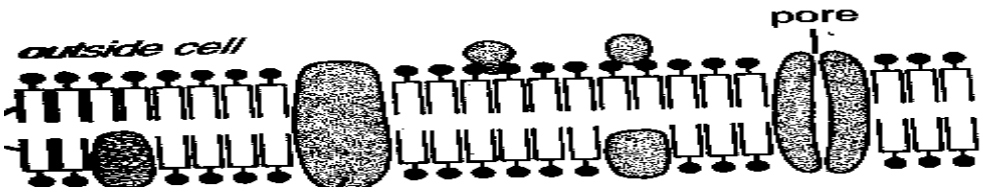
(c) **Which** child can receive blood from any member of the family? (1mark)

……
…

(d) **State** the percentage of children who can donate blood to all blood groups.(1mark)

……
…

2. Below is a diagram of a structure found in Eukaryotic cells? Study it and answer the questions that follow



a**) Identify** the structure (1 mark)

……..……
…

b) State **two** functions of the structure (2 marks)

i.

……
…

ii.

……
…

c) (i) Name **one** organelle found in animal cells but absent in plant cells (1 mark)

……..……
……

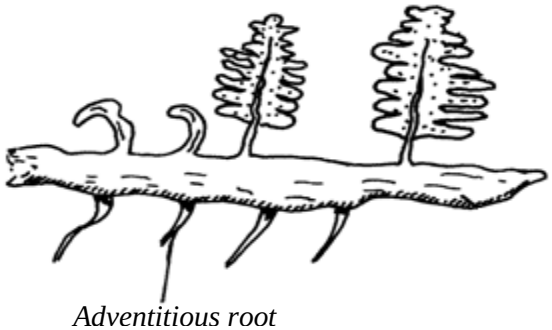
ii) State **one** function of the organelle you have named in(c) above (1 mark)

……
…

d) Briefly **explain** cell biology as an evidence of evolution (3 marks)

……
……
……

3. Below is a diagram of a plant a form three student collected while carrying out an ecological study?



Adventitious root

(a) With reasons identify the division into which the students classified the plant.

Division

……...

Reasons

…..…

b) (i) **Name** the structure that produces spores in this plant.

……..……

…….

……

(ii) State **two** differences between the plant division above and that of the division *spermatophyta.*

(2 marks)

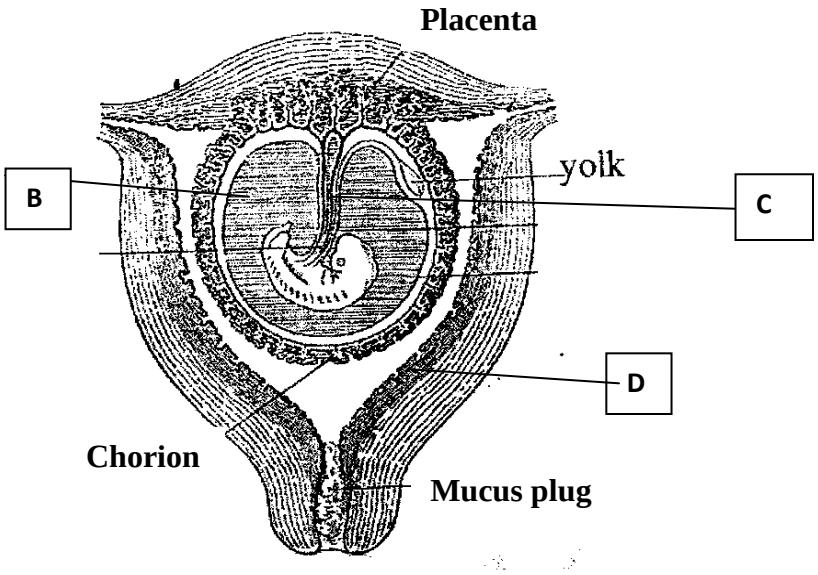
	Spermatophyte

c) Give **two** distinguishing features of class *Amphibia*

a) ……

b) ……

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



a) **Name** the part labeled D. (1 mark)

……

…

b) i) **Name** the types of blood vessels found in the structure labeled C. (2 marks)

……

….

ii) **State** the differences in composition of blood found in the vessels named in (b) (i) above.(2 marks)

iii) State **two** importance of the fluid found in part B (2 marks)

……

……

……

.iv) **State** the role of progesterone during pregnancy (1 mark)

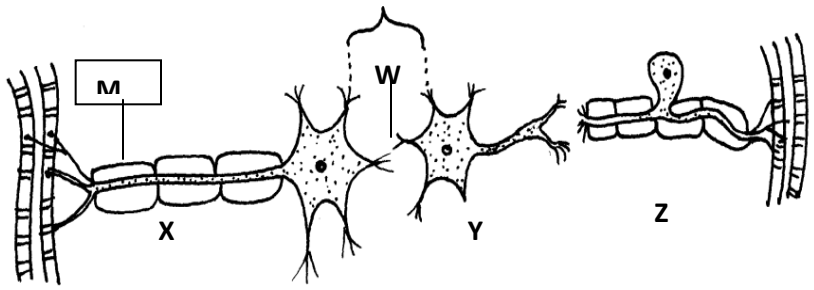
……

……

……

……

5. The diagram below represents three types of neurons found in a mammalian body.



(a) Name the neurons **X, Y** and **Z** (3marks)

X……..

Y…….

Z……

(b) Name the chemical substance responsible for the transmission of an impulse across the gap labelled **W**. (1mark)

……...….

(c) State **two** functions of the part labelled **M**. (2marks)

……...…

……

……...….

(d) In which part of the spinal cord is neurone **Y** located? (1mark)

……..…

(e) Using arrows indicate on the diagrams the direction followed by nerve impulse leading to a response. (1mark)

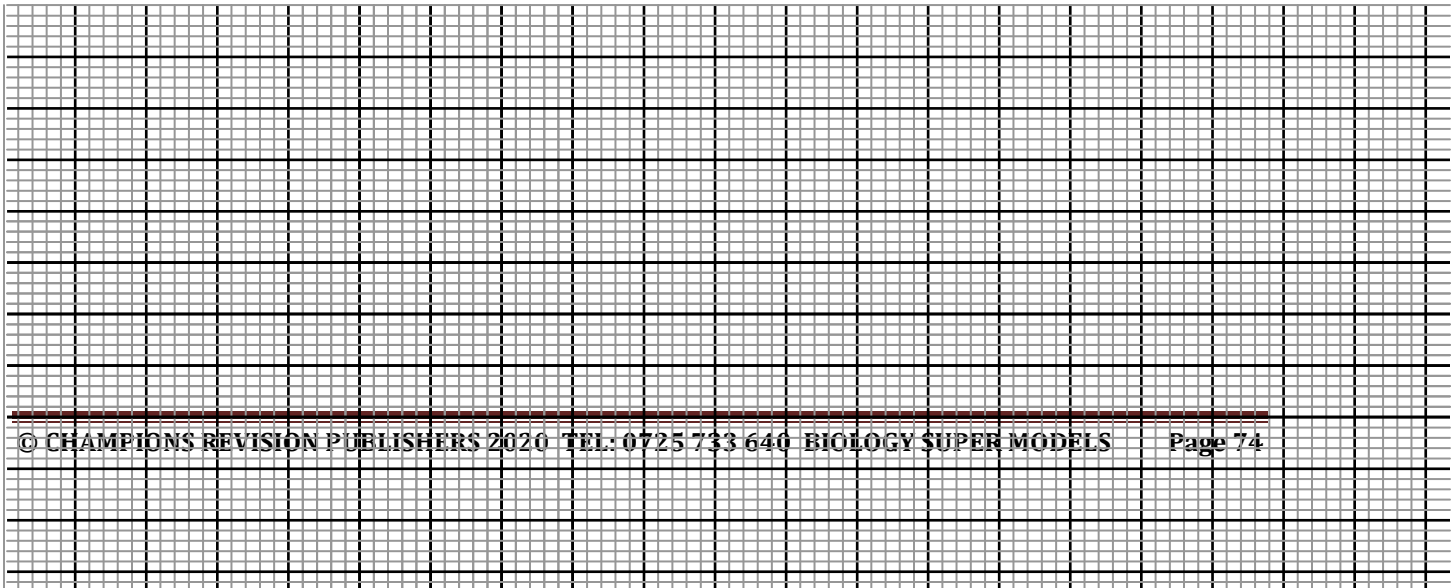
SECTION B (40MARKS)

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

6. During germination and growth of a cereal, the dry weight of endosperm, the embryo and total dry weight were determined at two – day intervals. The results are shown in the table below.

Time after planting(days)	Dry weight of endosperm	Dry weight of embryo (mg)	Total dry weight (mg)
0	43	2	45
2	40	2	42
4	33	7	40
6	20	17	37
8	10	25	35
10	6	33	39

a) Using the same axes, draw graphs of dry weigh of endosperm, embryo and the total dry weight against time
(8marks)



b**) What** was the dry weight of the endosperm and embryo on the **5th day?** (2marks)

Endosperm

……...….Embryo

……...….

c) **Account** for:

i) Decrease in dry weight of endosperm from day 0 to 10 (2marks)

……

……

ii) Increase in dry weight of embryo from day 0 day 10 (2marks)

……

……

iii) Decrease in total dry weight from day 0 to day 8 (2marks)

……

……

d) **State** the role of the following in germination (2marks)

i) Glucose

……

ii) Enzymes

……

e) **How** are the foliage leaves adapted to their function (2 marks)

……

… ……

7 (a) **Describ**e the role of hormones in blood sugar regulation (10 marks)

(b) **Explain** how halophytes are adapted to their habitat (10 marks)

8 (a**) Explain** the adaptations of thoracic, cervical and lumbar vertebrae to their functions (12 marks)

(b) **Describe** the structural factors affecting transpiration (8 marks)

(THEORY)

JULY/AUGUST, 2016

TIME: 2 HOURS

KIRINYAGA CENTRAL SUB-COUNTY EFFECTIVE FORTY

JOINT EXAMINATION – 2016

Kenya Certificate of Secondary Education

BIOLOGY

PAPER 1

(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. Answer **all** the questions in the spaces provided.
4. Answers must be written in the spaces provided in the question paper.
5. Additional pages **must not** be inserted.

FOR EXAMINER'S USE ONLY:

Question	Maximum Score	Candidate's Score
1 - 23	80	

1. (a) Define the term growth. (1 mark)

……

(b) Name the tissue in plants responsible for:

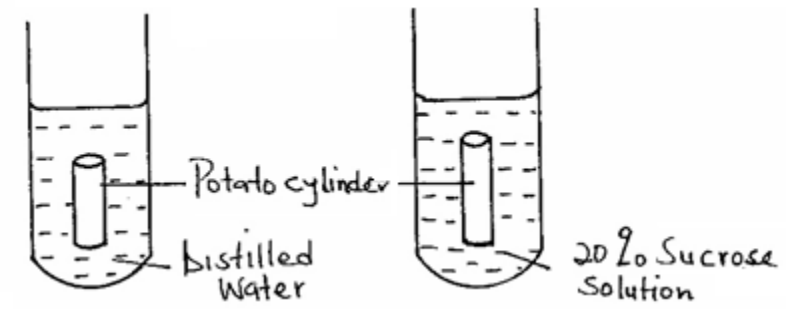
(i) Primary growth. (1 mark)

……

(ii) Secondary growth. (1 mark)

……

2. Two potato cylinders were carefully dried on a blotting paper and weighed. Each piece weighed 2 grams. One was placed in each test tube as shown in the diagram below.



(a) After 48hrs, which potato cylinder will be heavier. Explain. (2 marks)

……

……

(b) Name the substance whose movement was responsible for the weight changes in the potato cylinder you identified in (a) above. (1 mark)

……

(c) Name the process which was responsible for the movement of the substance you identified in (b) above. (1 mark)

……

3. Why are the following steps taken when preparing across section of a leaf for viewing under the microscope?

(a) Cutting thin section. (2 marks)

……

(b) Placing the section in water. (2 marks)

……

……

4. Below is the dental formula of a mammal.

$$i\frac{0}{4}, c\frac{0}{0}, pm\frac{3}{3}, m\frac{2}{3}$$

(a) What is the total number of teeth? (1 mark)

…….

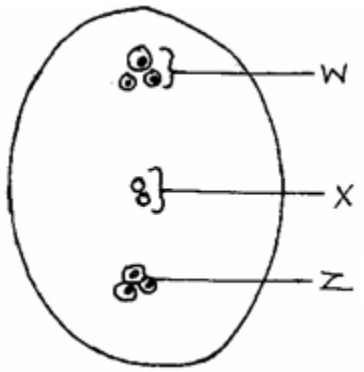
(b) (i) What is mode of feeding in the mammal? (1 mark)

……..

(ii) Give **one** reason for your answer above. (1 mark)

……..

5. Below is a diagram of a mature embryo sac.



(a) Name the parts labelled.

(i) **W** …….. (1 mark)

(ii) **Z** …… (1 mark)

(b) Give the name of the part of the seed formed when the part labelled **X** fuses with one of the male nucleus. (1 mark)

…….

6. The table below shows approximate numbers of organisms found in an ecosystem.

Type of organism	**Numbers**
Grasshoppers	Many
Hawks	3 – 4
Snakes	15 – 30
Green plants	Very many
Lizards	80 – 120

(a) Using the information in the table draw a pyramid of numbers. (3 marks)

…….

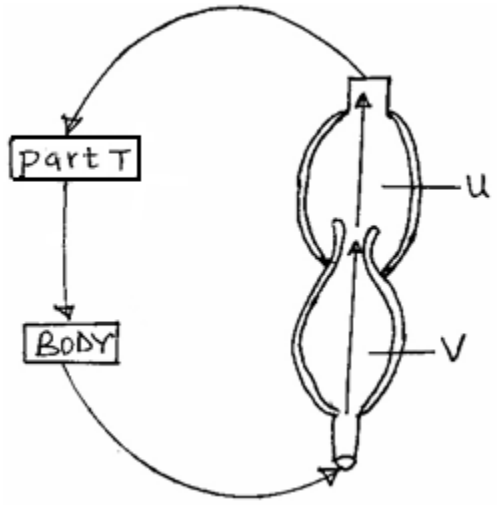
…….

(b) Explain what would happen to the other organisms if all the lizards suddenly died off. (2 marks)

…….

…….

7. The diagram below show single circulation a fish.



(a) Write down the names of the parts labelled **U** and **V**. (2 marks)

…….

(b) Explain the main disadvantage of this type of circulation. (1 mark

…….

8. Mr. Juma has sued Serenity Hospital on grounds that their child was wrongly identified such that they got the wrong one. The child is blood group O. Mr. Juma is blood group AB while Mrs. Juma is heterozygous blood group A.

(a) Work out the possible blood group of their offsprings. (4 marks)

(b) Is Mr. Juma justified in his claims? (1 mark)

……

9. (a) Name the bacteria found in the root nodules of leguminous plant. (1 mark)

……

(b) What is the role of the bacteria named in (a) above? (1 mark)

……

10. (a) Which substance in the cigarettes smoke may cause lung cancer. (1 mark)

……

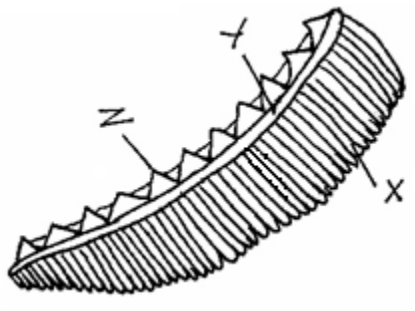
(b) The table below shows differences in air breathed in and out.

Gas	Volume of air breathed in	Volume of air breathed out
Oxygen	21.00	16.00
Carbon (IV) oxide	0.04	4.00

What is the reason for there differences. (2 marks)

……

11. The diagram below represents an organ of gaseous exchange.



(a) What is the name of the organ? (1 mark)

……

(b) Name the class to which the animals that have the organ you identified in (a) above belongs. 1 mark)

……

(c) State **one** way in which structure **X** is adapted for gaseous exchange. (2 marks)

……

12. In a prolonged drought period, forage was scarce. It made animals reach out for higher forage and this way the giraffes got the stretched long necks.

(a) What is the term used for a characteristic such as the long necks outlined?

(1 mark)

……

(b) What is the name given to the theory that describes the evolution of such structures like the long necks? (1 mark)

……

(c) State and explain the limitation of the theory you named in (b) above. (2 marks)

……

13. (a) A goat weighing 20kg requires 216KJ while a mouse weighing 54gms requires 2830KJ per day. Explain. (2 marks)

……

(b) What is the end products of respiration in plants when there is insufficient oxygen supply? (1 mark)

……

……

14. State the functions of the following male hormones.

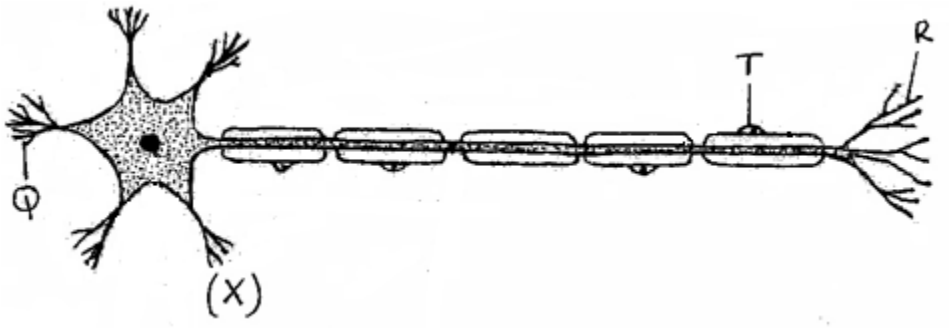
(a) Follicle stimulating hormone. (1 mark)

……

(b) Luteinizing hormone. (1 mark)

……

15. The diagram below represents the structure of a nerve cell.



(a) Identify the nerve cell. (1 mark)

……

(b) Give a reason for your answer in (a) above. (1 mark)

……

(c) State the function of the part labelled **T**. (1 mark)

……

(d) Using an arrow show the direction of an impulse on the diagram. (1 mark)

16. A food substance called tripalmitin $C_{15}\ H_{98}\ O_6$ was oxidized fully and the following equation worked out.

$2C_{51}\ H_{98}\ O_6 + 145O_2 \rightarrow 102CO_2 + 98H_2O$

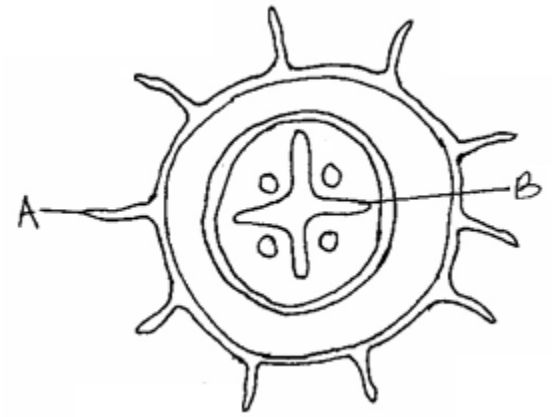
(a) Calculate the RQ of tripalmitin. (2 marks)

……

(b) From the RQ value obtained above, to what group of food substances does tripalmitin belong. (1 mark)

……

17. The diagram below represents a cross section obtained from a plant. Use it to answer the questions that follow.



(a) From which part of the plant was the section obtained from: (1 mark)

……

(b) Give a reason for your answer in (a) above. (1 mark)

……

(c) Name part **B**. (1 mark)

……

(d) Name the material that strengthens the part you named in (c) above. (1 mark)

……

18. (a) Given a sample of urine, name one test you would carry out to determine if it was obtained from a person suffering from diabetes mellitus. (1 mark)

……

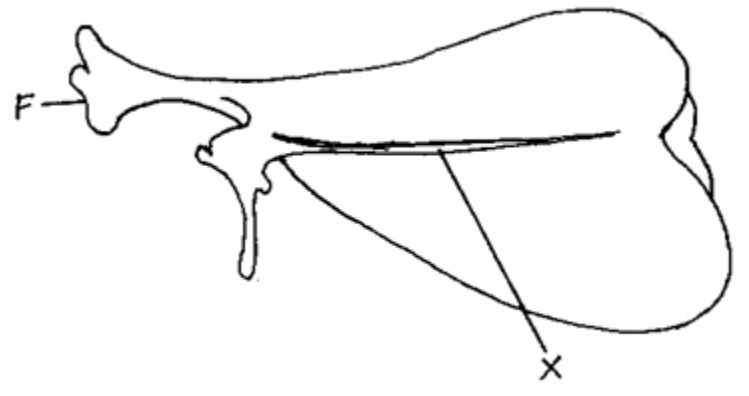
(b) What results are expected if one is diabetic? (2 marks)

……

(c) Explain why sugar appears in the urine of a diabetic. (2 marks)

……

19. The diagram below represents a bone of a mammal.



(a) Identify the bone. (1 mark)

……

(b) Name the part marked **X**. (1 mark)

…….

(c) Name the bone that articulates at the part labelled **F**. (1 mark)

…….

(d) Explain one way in which the bone is adapted to its function. (1 mark)

…….

20. (i) Name the class in the phylum arthropoda with the largest number of individuals.

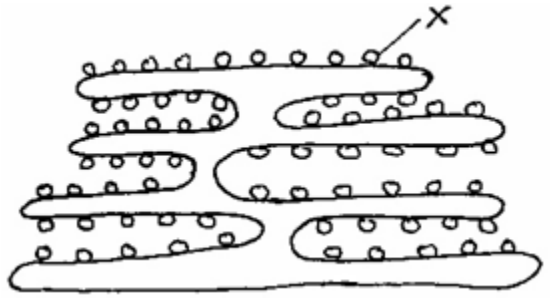
…….. (1 mark)

(ii) State **three** adaptations that makes this class very successful. (3 marks)

…….

…….

21. The diagram below represents a cell organelle.



(i) Name the organelle above. 1 mark)

…….

(ii) State it's function. (1 mark)

…….

(iii) Identify the structures labelled **X** and state it's functions. (2 marks)

…….

…….

22. (a) In which organ is cardiac muscle found. (1 mark)

……

(b) What is the function of the cardiac muscle in the organ you have named in (a) above. (1 mark)

……

23. How does carboxyhaemoglobin lead to death? (2 marks)

……

BIOLOGY

PAPER 2

JULY/AUGUST, 2016

TIME: 2 HOURS

KIRINYAGA CENTRAL SUB-COUNTY EFFECTIVE FORTY

JOINT EXAMINATION – 2016

INSTRUCTIONS TO CANDIDATES:

- Write your **name** and **index number** in the spaces provided above.
- **Sign** and write the **date** of examination in the spaces provided above.
- This paper consists of **Two** Sections; **A** and **B**.
- Answer all the questions in Section **A** in the spaces provided.
- Answer question **6** in Section **B (Compulsory)** and either question **7** or **8** in the spaces provided after question **8**.

- Check to ascertain that all pages are printed and that no questions are missing.

FOR EXAMINER'S USE ONLY:

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	

SECTION A: (40 MARKS)

Answer all the questions in this section in the spaces provided:

1. The diagrams below represents germination in plants.

(a) Name the type of germination in A and B above. (1 mark)

A …….. **B**……

(b) In seed germination, the radicle grows before the shoot. Explain.(2 marks)

……..

……..

(c) Define the term seed dormancy. (1 mark)

……..

(d) State **two** causes of seed dormancy. (2 marks)

……..

(e) State **two** roles of water in seed germination. (2 marks)

……..

……

2. During a strenuous exercise, the chemical process represented by the equation below takes place in human muscles.

$C_6 H_{12} O_6 \rightarrow 2CH_3 CH (OH) COOH + 150kJ$

(Substance X)

(a) Name the process. (1 mark)

……..

(b) Name substance **X**. (1 mark)

……..

(c) State **two** economic importance of the above process. (2 marks)

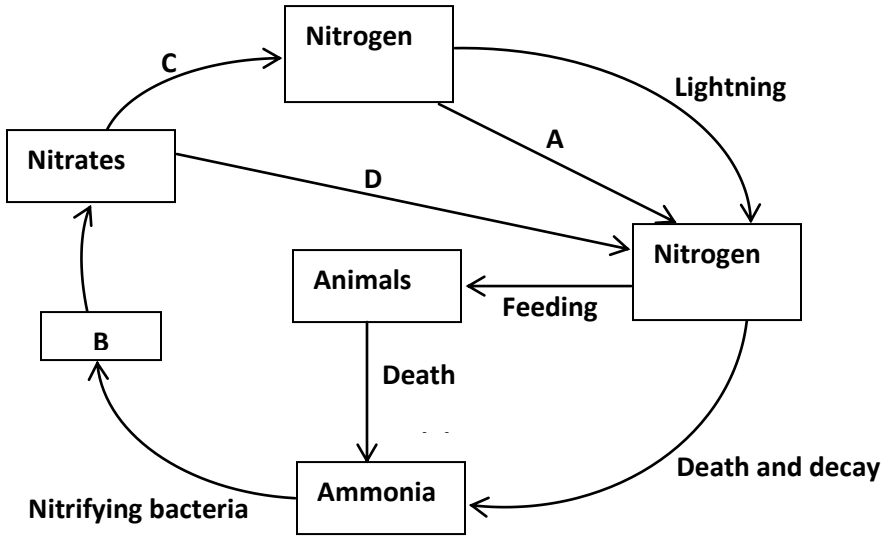
……..

(d) Explain what happens to X after the exercise. (2 marks)

……..

(e) State **two** differences between aerobic respiration and photosynthesis. (2 marks)

3. The diagram below represents the nitrogen cycle.



(a) Identify the processes labelled **A** and **D**. (2 marks)

A …….. **D** ……..

(b) Name the compound represented by **B**. (1 mark)

……

(c) Name the group of organisms labelled **C**. (1 mark)

……

(d) (i) Name the group of plants that promote process **A**. (1 mark)

…….

(ii) In which part of the plant does process **A** take place? (1 mark)

……..

(e) How would excess pesticides in the soil interfere with process **A**? (2 marks)

……

4. (a) Explain what happens when a wilting young plant is well watered. (3 marks)

……

……

(b) Name a support tissue in plants thickened with:

(i) Cellulose. (1 mark)

……..

(ii) Lignin. (1 mark)

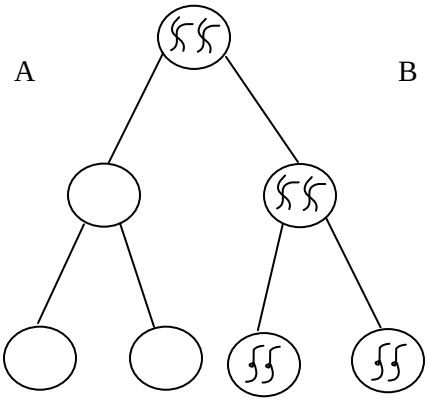
……..

(c) Describe the role of the liver in deamination. (3 marks)

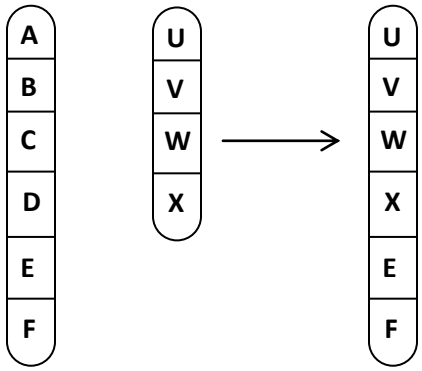
……

5. The diagrams below illustrate some chromosome mutations.

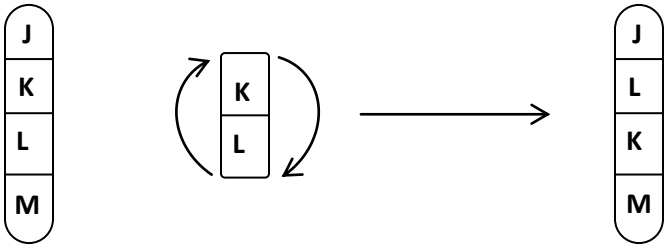
A



B



C



(a) Identify the mutations illustrated above. (3 marks)

A …….

B …….

C …….

(b) Give an example of a disorder in humans caused by mutation **A** above. (1 mark)

…….

……

(c) Name a disorder of blood caused by gene mutation. (1 mark)

……

(d) Name **two** mutagens. (2 marks)

……

……

(e) Give an example of a beneficial mutation in plants. (1 mark)

……

SECTION B: (40 MARKS)

Answer question **6** in Section **B (Compulsory)** and either question **7** or **8** in the spaces provided after question **8**.

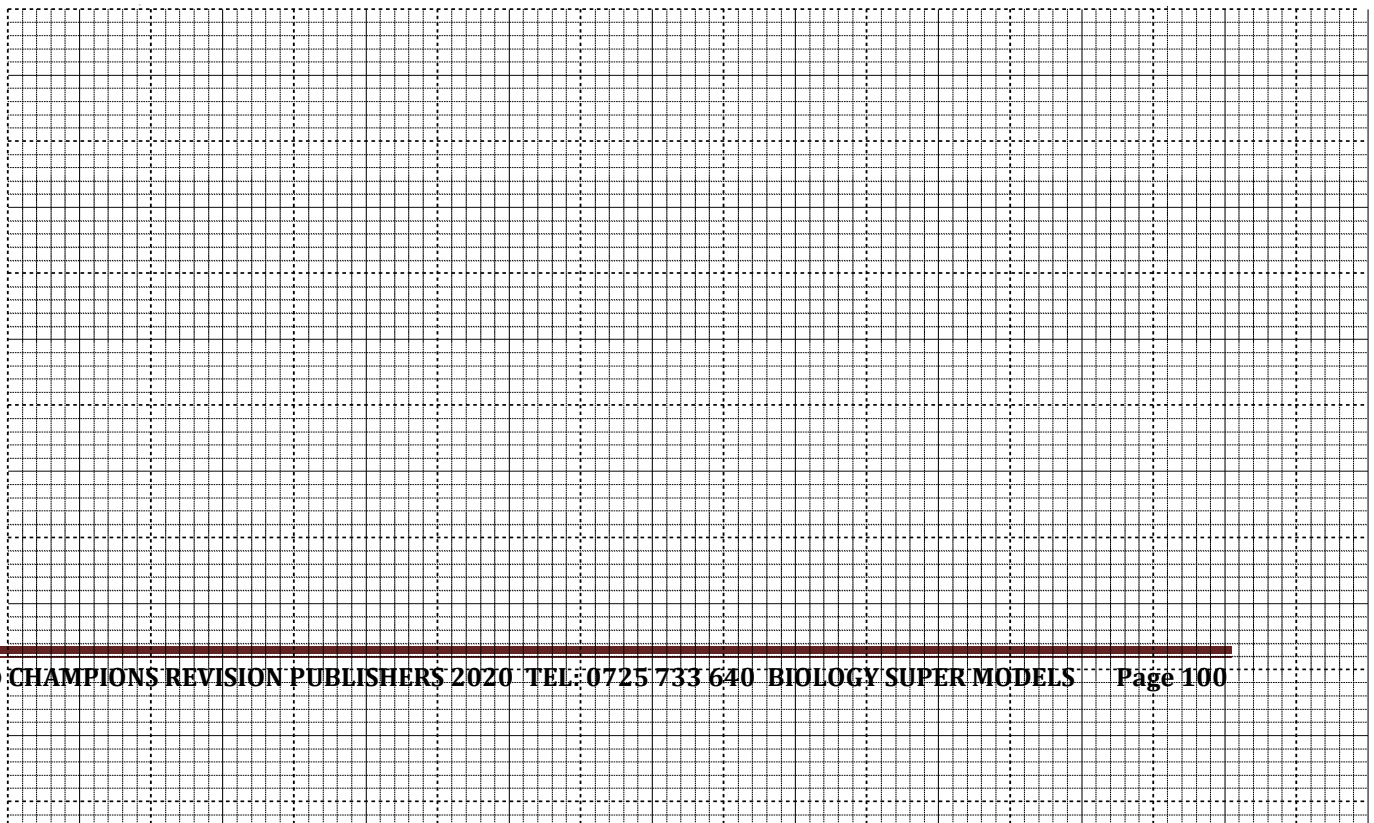
6. The hormone Human Chorionic Gonadotrophin (HCG) is released from embryonic tissues. The effects of HCG is to prevent the degeneration of corpus luteum.

Study the table below, which shows changes in concentration in the blood of HCG and progesterone during the first 36 weeks of pregnancy.

Time in weeks	Concentration of HCG	Concentration of progesterone

	(arbitrary units)	(arbitrary units)
0	0	7
2	3	7
4	15	8
8	60	9
12	45	10
16	24	11
20	12	13
24	10	15
28	10	20
32	14	30
36	12	55

(a) Using the grid provided, plot graphs of concentration of HCG and progesterone produced against time.



the concentration of HCG progesterone in week 11? (2 marks)

……..

……..

(ii) When are the two hormones equal in concentration? (2 marks)

……..

(iii) Account for the changes in HCG concentration during the first 20 weeks of pregnancy. (4 marks)

……..

……..

(c) State **three** functions of progesterone. (3 marks)

……..

……..

(d) What is the role of testosterone in a human male? (1 mark)

……..

……..

7. (a) State **three** processes by which flowering plants excrete waste products and for each process name **two** waste products that are eliminated. (6 marks)

(b) Describe the functions of the various components of the mammalian blood. (14 marks)

8. Describe the movement of water from the soil to the leaves of a tall plant. (20 marks

…….

……..

…….

231/1
BIOLOGY
PAPER 1
TIME:2 HOURS
JULY/AUGUST 2016

KIRINYAGA EAST SUB-COUNTY
CENTRAL ZONE STRATEGIC ALLIANCE EXAMINATIONS 2016
(Kenya Certificate of Secondary Education –K.C.S.E

231/1
BIOLOGY
PAPER 1

INSTRUCTIONS TO CANDIDATE

- ✓ Write your name and index number n the spaces provided above
- ✓ Sign and write the date of examination
- ✓ Answer **all** the questions in the spaces provided after every question

This paper consists of 12 printed pages. Candidates should check the question paper to ensure that all pages are printed as indicated and no questions are missing.

1. What is active transport? (2mks)

   ……

   ……

   ……

2. Give 3 adaptations of animal dispersed fruits and seeds. (3mks)

   ……

   ……

   ……

   ……

3. State three functions of hoigi apparatus. (3mks)

……
……
……
……..

4. (a) What is the difference between Darwinian and lamarckian theories of evolution? (2mks)

……
……
……

(hi Distinguish between convergent and divergent evolution. (2rnks)

……
……
……..

5. State the characteristics that can separate the following organisms into respective classes; millipedes, tsetse fly and spider. (3mks)

……
……
……
……

6. Name the blood vessel that transports blood from

(a) The heart to the lungs. (lmk)

……
……

(b) Small intestines to the liver. (1mk)

……
……

7. State three ways in which the tracheole system in insects is adapted for gaseous exchange. (3mks)

……
……
……
……..

8. State the rote of the following hormones in organisms

a) Auxin (l mk)

……
……

b) Anti diuretic hormone (lmk)

……
……..

9. Name three types of gene mutations (3mks)

……
……
……
……..

10. Name the spore producing structures in:

(a) Bryophytes (lmk)

……
……

(b) Pteridophytes (lmk)

……
……

11. (a) During which phase of meiosis does crossing over occur? (lmk)

……
……

b) How do identical and fraternal twins arise

i) Identical twins (2mks)

……

……

……

……..

ii) Fraternal twins (2mks)

……

……

……

……

12. Which one of the cell organelles would be found in large numbers in:

(a) An enzyme-secreting cell (lmk)

……

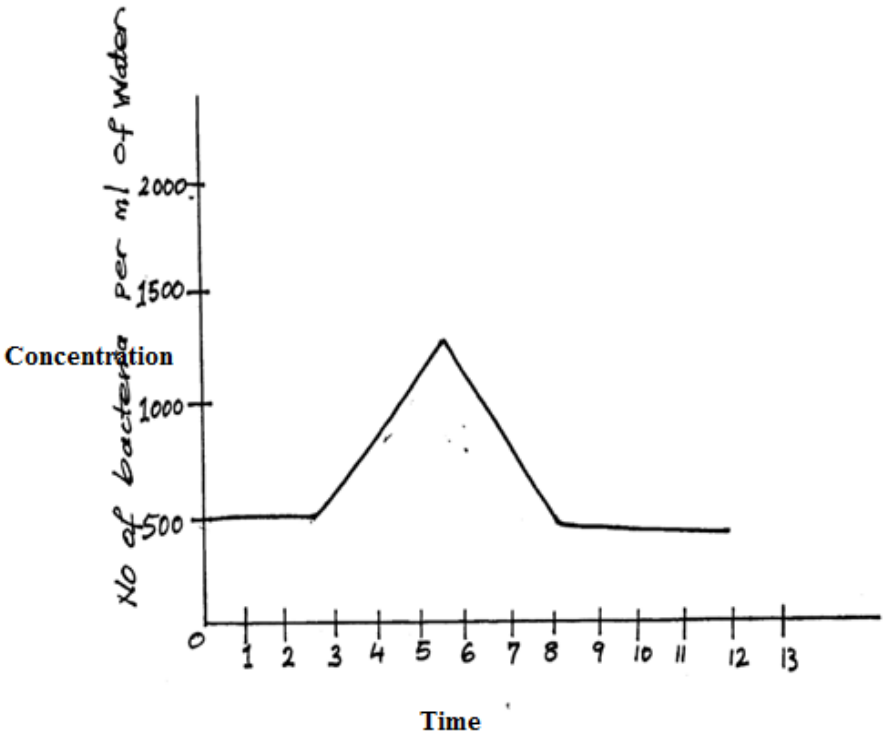
…….

(b) A rapidly respiring cell in comparison to other cells in the same organism. (lmk)

……

…….

13. The graph below is of sewage on the population of a species of bacteria in a certain river.



(i) Account for the changes in population of bacteria between 2 and 10 kilometers down the river. (2mks)

……

……

……

……

14. Differentiate between interspecific and intraspecific competition. (2mks)

……

……

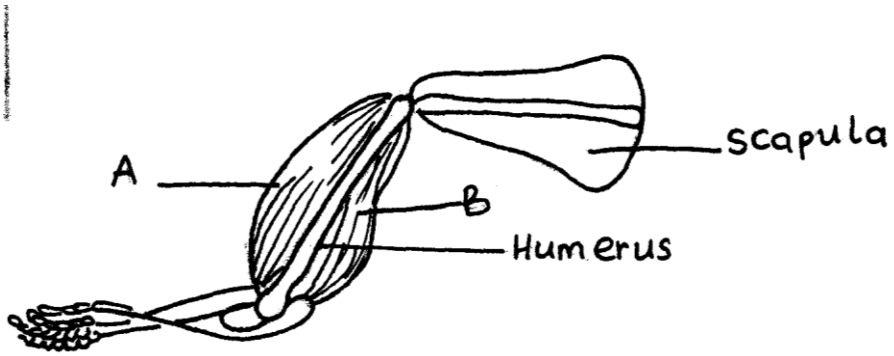
……

……

15. Other than energy, name the other products of anaerobic respiration in plants. (2mks)

……
……
……
……

16. Study the diagram below and answer the questions that follow.



(i) Name the muscles labeled A and B. `(2mks)

A……

……B…

……

……

(ii) What happens to each muscle as the arm is stretched? (2mks)

……

……

……

17. In an accident, a victim suffered brain injury. Consequently he had loss of memory. Which part of the brain was damaged? (lmk)

……

……

18. Name three membranes that surround the central nervous system. (3mks)

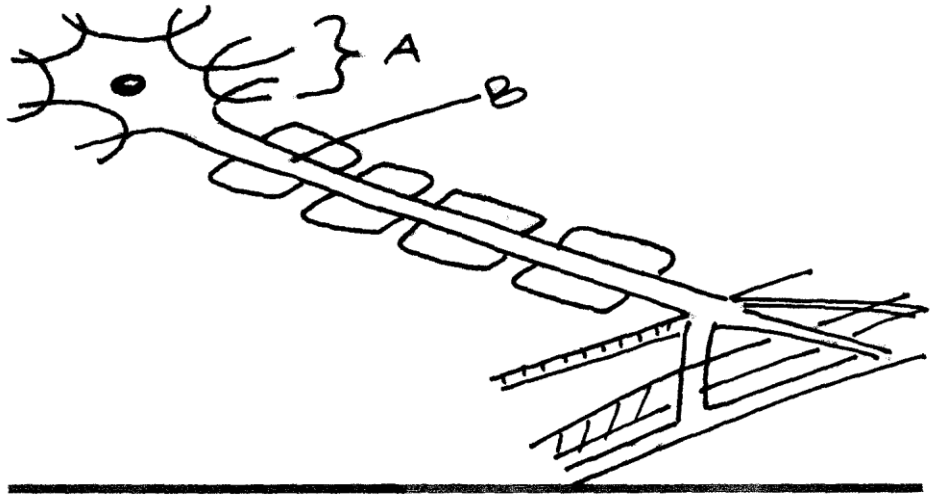
……

……

……

……

19. The diagram below represents a neuron.



(i) Name the neuron . (lmk)

……

……

(ii) Name the parts labeled A and B. (2mks)

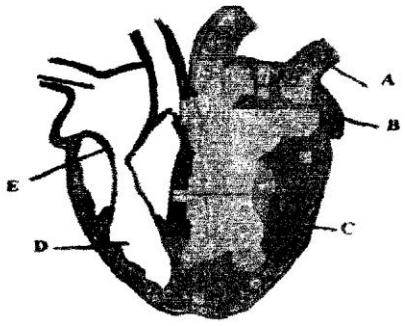
A……

……B…

……

……

(20) The diagram below shows a vertical section through a mammalian heart.



(a) Name the parts labeled A and E. (2mks)

A……

……..

E……

……..

(b) Give a reason why the wall of chamber C is thicker than chamber D. (2mks)

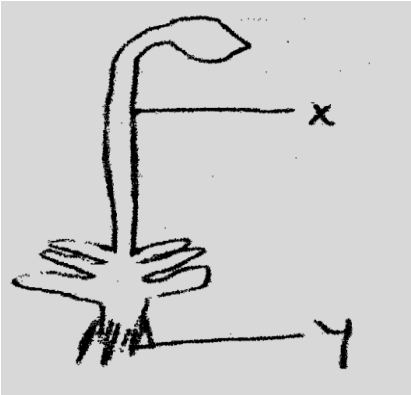
……

……

……

……

21. The diagram below represents a plant



(a) State the division in which the plant belongs. (1mk)

……

(b) Label the parts X and V. (2mks)

X…….

Y……..

22. State two ways in which xylem vessels are adapted to their functions. (2mks)

……

……

……

……

23. (a) State two differences between simple reflex action and conditioned reflex action. (2mks)

……

……

……

……

(c) State any two functions of cerebellum. (2rnks)

……

……

……
……

24. (a) What is seed dormancy? (lmk)

……
……

(b) Account for the following phases of a sigmoid curve of growth of an organism.

(i) Lag phase. (1mk)

……
……

(ii) Plateau phase. (lmk)

……
……

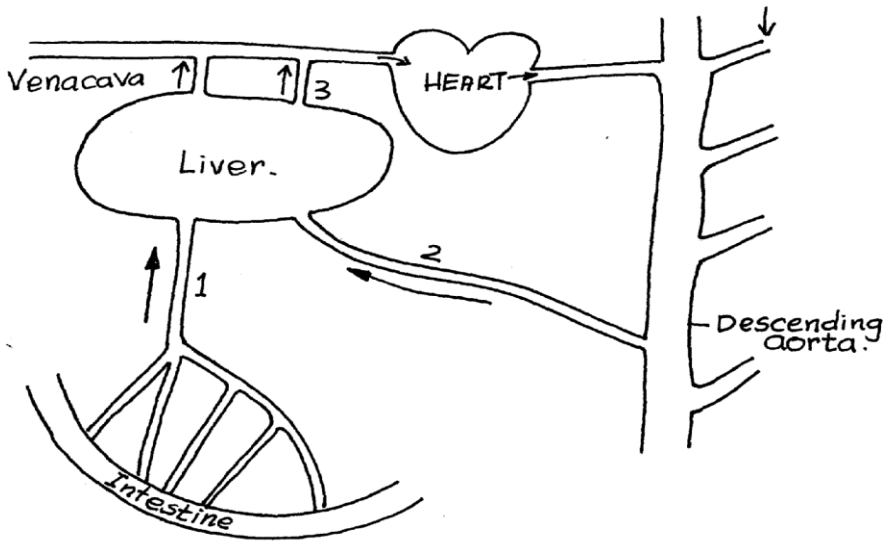
25. State two characteristics of aerenchyma tissue. (2mks)

……
……
……
……

26. What is the significance of transpiration in plants? (2mks)

……
……
……
……

27. The figure below illustrates the blood supply and drainage of the liver.



(a) In which of the blood vessels labeled 1,2 and 3 would you expect the highest concentration of glucose two hours after eating a starchy meal? Give a reason. (2mks)

……

……

……

(b) Name the blood vessel labeled 2 . (lmk)

……

……

28. (a) Name two classes of animals that excrete their nitrogenous waste products mainly in form of uric acid. (2mks)

……

……

……

b) State how excretion is achieved in plants. (2mks)

……

……

……

29. Part of one strand of DNA mo1ecue was found to have the following sequence.

G-C-C-T-A-G-A-T

(i) What is the sequence of the complimentary DNA strand? (lmk)

……

……

(ii) What is the sequence of the MRNA strand copied from this DNA portion? (lmk)

……

……

23 1/ 2
BIOLOGY PAPER 2
(THEORY)
TIME: 2HRS

KIRINYAGA EAST SUB-COUNTY
CENTRAL ZONE STRATEGIC ALLIANCE EXAMINATIONS 2016
(Kenya Certificate of Secondary Education –K.C.S.E)

23 1/ 2
BIOLOGY PAPER 2
(THEORY)

INSTRUCTIONS TO CANDIDATES

- ✓ Write your name and index number in the space provided
- ✓ Sign and write the date of the examination in the space provided.
- ✓ This paper consists of two sections A and B
- ✓ Answer **ALL**.the questions in section A in the space provided
- ✓ In section B answer question 6 (**COMPULSOR**Y) and **EITHER** question 7 or 8 in the space provided after question 8.

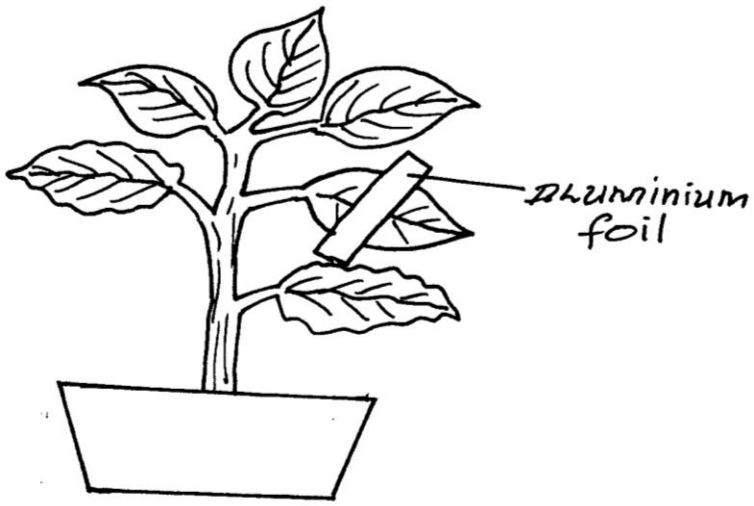
FOR EXAMINERS USE ONLY.

SECTION	QUESTION	MAXIMUM	CANDIDATE'S SCORE
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
B	6	20	
	7	20	
	8	20	
TOTAL SCORE		**80**	

This paper consists of 12 printed pages. Candidates should check the question paper to ensure that all pages are printed as indicated and no questions are missing.

SECTION A (4OMKS)

1. In an experiment to investigate a factor affecting photosynthesis, a leaf of a potted plant which had been kept in the dark overnight was covered with aluminium foil as shown in the diagram below.



The set up was kept in sunlight for three hours after which a food test was carried out on the leaf.

a) Which factor was being investigated in the experiment? (lmk)

……
……
……
……

b) What food test was carried out? (lmk)

……
……

c) (i)

d) State the results of the food test. (lmk)

……
……

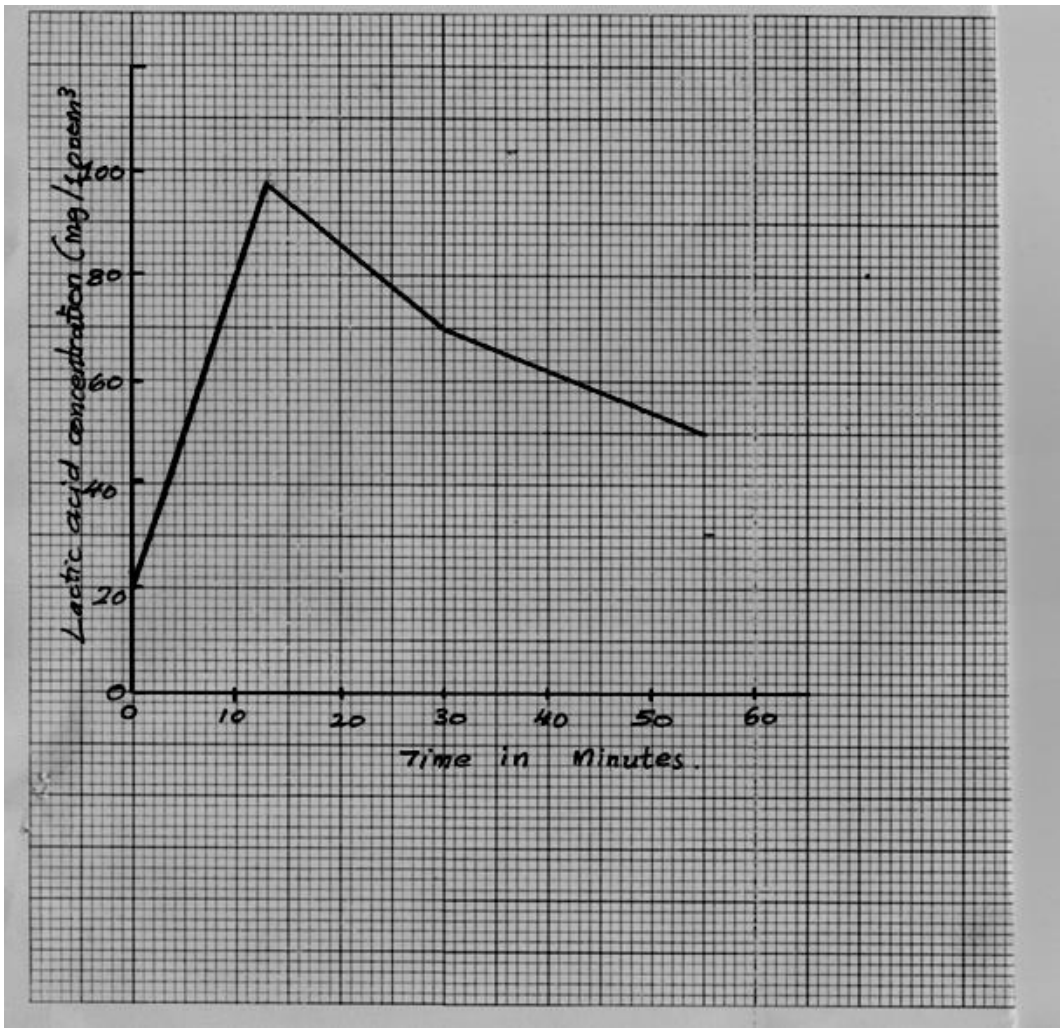
ii. Account for the results in c (i) above (2rnks)

……
……
……
……

e) Why was it necessary to keep the plant in darkness before the experiment? (lmk)

……
……

2. The concentration of the lactic acid in the blood during and after an exercise was determined. The results are as shown in the graph below.



a)

(i) By how much did the lactic acid increase in the end of 13 minutes? (lmk)

……

……

(ii) After how many minutes was the lactic acid concentration 71 mg/100cm^3? (2mks)

……

……

……

……

iii. What would be the concentration of lactic acid at the 60th minute? (2mks)

……
……
……
……

b) Give a reason for the high rate of production of lactic acid during the exercise. `(lmk)

……
……

c) Give a reason for decrease in the concentration of lactic acid after exercise. (lmk)

……
……

d) What is "oxygen debt"? (lmk)

……
……

3. a) What is meant by the term biological control? (lrnk)

……
……

ii.Give an example of biological control. (lmk)

……
……

b) What is eutrophication? (3mks)

……
……
……
……

ii. What are the effects of eutrophication ? (2mks)

……
……
……

c) Name a substance that is responsible for acid rain. (lrnk)

……
……

4. A cross between a red flowered plant and a white flowered plant produces plants with pink flowers. Using R to represent the gene for red colour and W for white colour;

a) What were the parental genotypes? (1rnk)

……
……

b) Work out a cross between Fl plants. (4mks)

……
……
……
……
……

c) Give the;

i, The phenotypic ratio of F2 plants. (lmk)

(ii) Genotypic ratio of F2 plants. (1mk

d) Name a characteristic in human which is controlled by multiple genes. (lmk)

……
……

5.. State four characteristics of apical meristem cells. (4rnks)

……
……
……
……..

b) State three ways by which plants compensate for lack of ability to move from one place to another. (1mk)

……
……

c) State one significance of wilting in young plants. (lmk)

……
……

SECTION B

6.. An experiment was carried out to investigate haemolysis of human red blood cells. The red blood cells were placed in different concentrations of sodium chloride solution. The percentage of haemolysed cells was determined. The results were as shown in the table below.

Salt concentration /g/100cm3/%	0.33	0.36	0.38	0.39	0.42	0.44	0.48
Red blood cells (haemolysed)%	100	91	82	69	30	15	0

a) (i)On the grid provided, plot a graph of haemolysed red blood cells against salt concentration. (6mks)

ii). At

what concentration of salt solution was the portion of haemolysed cells equal to non — haernolysed cells? (lrnk)

……
……

iii). State the percentage of cells haernolysed at salt concentration of 0.45%. (lrnk)

……
……

b) Account for the results obtained at:

(i) percent salt concentrion (3mks)

……
……
……
……

ii) 0.48 percent salt concentration. (3rnks)

……
……

c) What would happen to the red blood cells if they were placed in 030% salt concentration? (3mks)

……

d) Explain what would happen to onion epidermal cells if they were placed in distilled water

.(3rnks)……

7. Explain how mammalian eye is adapted to its function (20 mks)

8. Describe the role of hormones in the human menstrual cycle. (20mks)

……
……

231/1
BIOLOGY
PAPER 1
JULY - AUGUST 2016
TIME:2 HOURS

LUGARI SUB- COUNTY KCSE TRIAL EXAM 2016
Kenya Certificate of Secondary Education 2016
231/1
BIOLOGY
PAPER 1
JULY - AUGUST 2016
TIME:2 HOURS

INSTRUCTIONS TO CANDIDATES

• Write your **name** and **index number** in the spaces provided. -

• **Sign** and write **date** of examination in spaces provided.

• Answer **all** questions in the spaces provided in the question paper.

• Candidates should cheek the questi6n paper to ascertain that all pages are printed as indicated and that no questions arc missing.

• Candidates should answer the questions in English.

• *This paper consists of 12 printed pages. Candidates should check the question paper to ascertain that all pages are printed as indicated. And that no questions are missing.*

QUESTIONS

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

a). Condenser

……

……

(b). Coarse adjustment knobs

……

……

2. The equation below represents a process that takes place in the living cells.

$C_6H120_6 \longrightarrow 2C_2H_5OH + 2\ CO_2 + Energy$

(Glucose) (Ethanol) (Carbon (IV) Oxide)

(a). Identify the process.

(1mk)

……

……

(b). Name the organisms in which this process occurs.

(1mk)

……

……

(e). State the economic importance of the process identical in (a) above (2mks)

……

……

3. (a). Name the causative agent of Bilharzia (1mk)

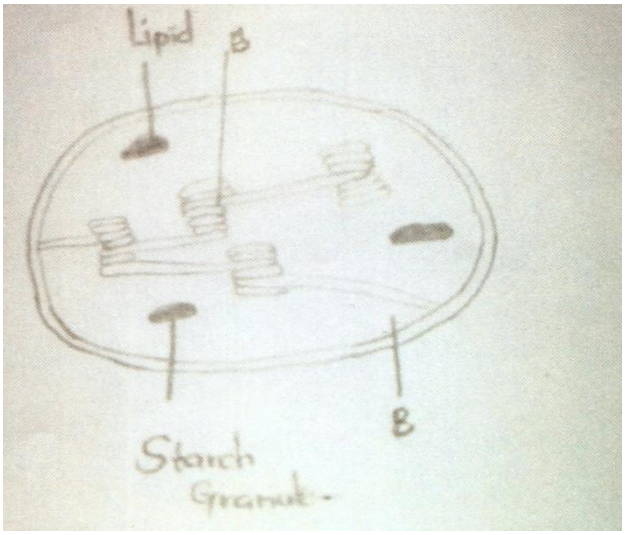
……

(b). Give a reason why a patient suffering from malaria develops anaemia (1mk)

……

……

4. The diagram below represents an organelle found in a plan



(a). Name the part labelled A. (1mk)

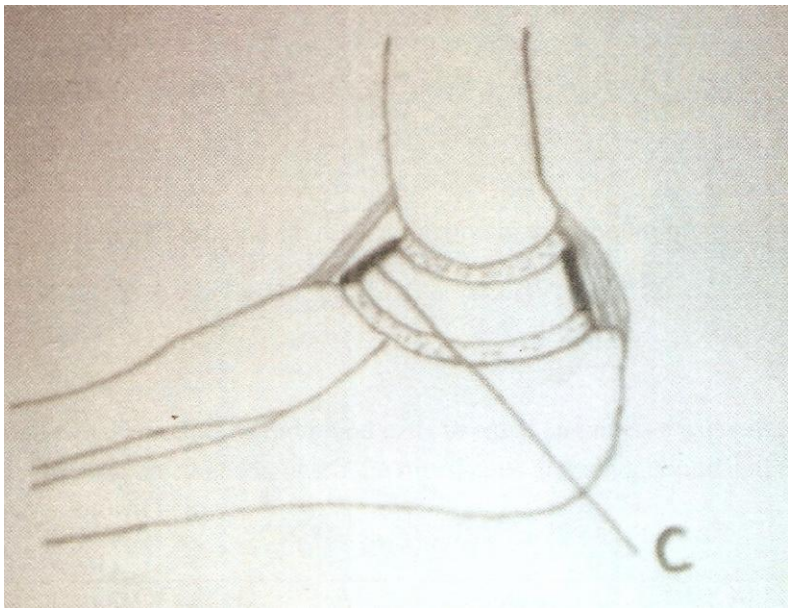
……

(b). Name the products of a process that occurs in the part labeled C (2mks)

……

……

5. The diagram below represents features of a joint in a mammal



(a). Name the joint shown in the diagram above (1mk)

……

……

(b). State the function of the part labelled C (2mks)

……

……

6. (a). What is emulsification (1mk)

……

……

(b). Name the products of digestion of carbohydrates in the ileum (2mks)

……

……

7. Explain how antidiuretic hormone causes a reduction in the amount of urine produced (1mk)

……

……

8. Students added equal amounts of red blood cells to equal amounts of salt solutions of different concentrations. They observed and counted the blood cells at the beginning and the end of the experiment. The results were as shown below.

Set up	Concentration	At the beginning	After 30 minutes
A	0.2%	Normal	Normal
B	0.02	Normal	Very few

Explain the results obtained in the set ups after the experiment

(i). Set A (1mk)

……

……

(ii). Set B (3mks)

……

……

……

……

9. Explain continental drift as an evidence of evolution (3mks)

……

……

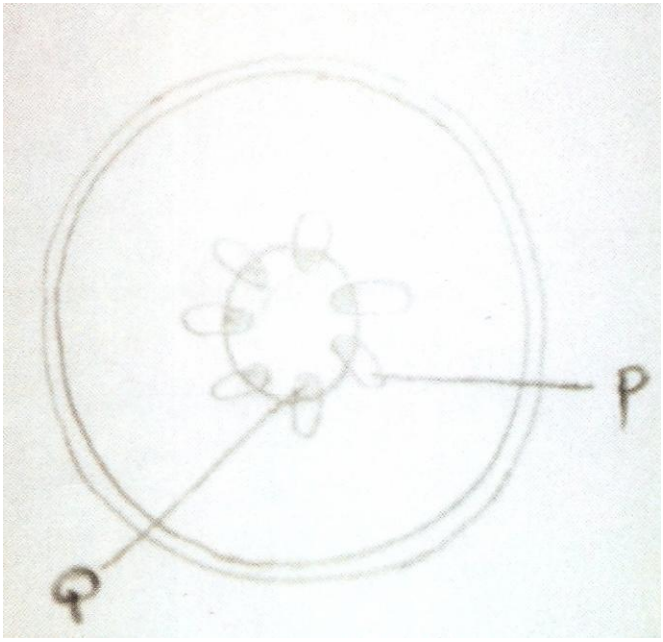
……

……

……

……

10. The diagram below represents a transverse section of a young stem.



(a). Name the part labelled P (1mk)

……

……

(b). State the adaptations of the part labelled Q (2mks)

……

……

……

……

11 (a). List down the main functions of the placenta in mammals. (2mks)

……

……

……

……

(b). Explain how the placenta protects the foetus against maternal blood pressure (1mk)

……

……

12. Explain how an alveolus is adapted to its functions (3mks)

……

……

……

……

13. (a). Distinguish between single and double circulatory systems (2mks)

……

……

……

……

(b). Explain the following observations.

(i). In mammals blood flows to the body tissues under high pressure (1mk)

……

……

(ii). In fish blood flows to the body tissues under low pressure (1mk)

……

……

14. Explain the effects of discharging industrial effluents into the fresh water lakes, rivers etc (3mks)

……

……

……

……

……

……

15. The figure below illustrates a portion of a chromosomes with genes named B, E, U, X, Y.

B	**E**	**U**	**X**	**Y**

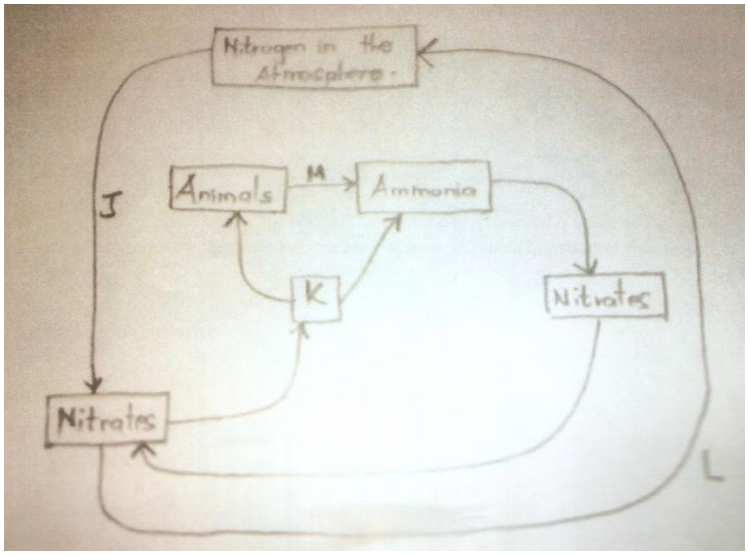
Use diagrams similar to the one above to illustrate the changes if the above chromosome undergoes the following mutations affecting only gene **E** and **U**.

(i). Inversion (lmk)

(ii). Duplication (1mk)

(iii). Deletion (1mk)

16. The diagram below represents simplified nitrogen cycle.



(a). Identify the group of organisms represented by K. (1mk)

……

……

(b). Name the processes represented by b, J and M (2mks)

……

……

……

……

(c). Name the organisms represented by L (1mk)

……

17. (a). Name **two** tissues in plants which are thickened with lignin. (2mks)

……

……

(b). Name the structure that attaches

(i). Bones to bones (1mk)

……

……

(ii). Bones to muscles. (1mk)

……

……

18. (a). State what happens to the following structures of the mammalian heart during diastole phase.

(i). Atrio-ventricular valves (1mk)

……

……

(ii). Ventricular muscles (1mk)

……

……

19. State **four** reasons why water is significant in seed germination. (4mks)

……

……

……

……

20. (a). Differentiate between the terms: dominant gene and recessive gene (2mks)

……

……

……

(b). State the expected results from a test cross (2mks)

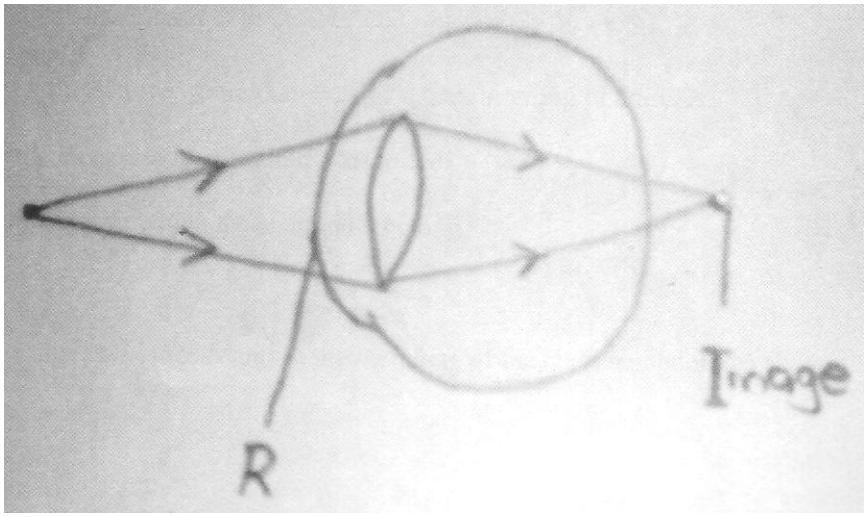
……

……

……

……

21. The diagram below represents an eye defect.



(a). Name the part labelled R (lmk)

……

……

(b). Identify the defect. (1mk)

……

……

(e). Explain how the defect identified in (b) above can be corrected (2mks)

……

……

……

……

22. When are the following hormones secreted

(i). Insulin (1mk)

……

……

(ii). Antidiuretic hormone (1mk)

……

……

(b). Explain why fresh water protozoan's e.g. Amoeba do not burst when placed in distilled water (2mks)

……

……

……

……

23. The list below shows some members of a certain group of animals Locusts, Bees, House flies and Mosquitoes

(a). Name the class to which these animals belong (1mk)

……

(b). State the characteristics found in the members of the class named in (a) above (2mks)

……

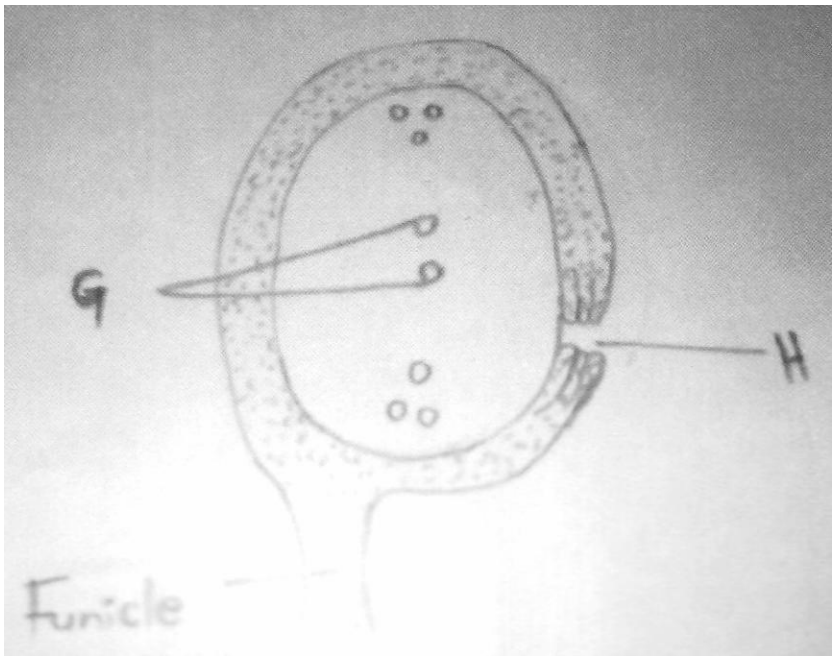
……

(c). Name the growth pattern exhibited by members of the phylum to which the insects above belong (1mk)

……

……

24. The diagram below represents an ovule



(a). Name the part labelled **G**. (1mk)

……

……

(b). State the function of the part labelled **H** (1mk)

……

……

(c). What is double fertilization (2mks)

……

……

……

……

25. (a) State the function of the enzyme rennin. (1mk)

……

……

(b) Give reasons why enzyme pepsin is produced in its inactive state as pepsinogen (1mk)

……

……

(c) Name the food process by which food is moved through the alimentary canal (1mk)

…

NAKURU
231/1
BIOLOGY
PAPER 1
(Theory)
JULY/AUGUST 2016
TIME: 2 HOURS

1. State one use of each of the following apparatus in the study of living organism
   a) Bait trap (1mark)

   (b) Pooter (1mark)

2. Mention two functions of cell sap (2 marks)

3. State two functions of Rough endoplasmic reticulum (2 marks)

4. Using a microscope, a student counted 30 cells across a field of view whose diameter was 6000µm. Calculate the average length of a cell. Show your working. (2 marks)

5. (a) State two features of a ball and socket joint (2 marks)

   (b) Name the bone that allows the head to, (2 marks)
   (i) Node
   (ii) Turn side ways……

6. Name the type of skeleton that makes up the body of each of the following animals (2 marks)
   (a) Locust……

   (b)
   bird…….....

7. The diagram below represents a mammalian bone

   (a) Name the bone (1 mark)

(b) Name the type of joint formed by the bone at its anterior end with the adjacent bone (1 mark)

8. List four symptoms of diabetes mellitus (4 marks)

9. State one economic importance of each of the following (3 marks)

   (a) Tannin

   (b) Quinine

   (c) Caffeine

10. Name the organism that;
    (a) (i) causes malaria (1 mark)

    (ii) Transmits malaria (1 mark)

    (b) State two control measures for malaria (2 marks)

11. During an ecological visit to the savanna grassland, students were able to see lions, antelopes, vultures and pastoralists grazing their cattle. Construct a food chain with four consumer levels to illustrate the energy flow in the ecosystem (1 marks)

12. (a) Explain the reason why the action of ptyalin enzyme stops in the stomach (2 marks)

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

13. The diagram below shows a human tooth

(a) Identify the tooth (1 mark)

(b) How is the tooth adapted to its functions (1 mark)

(c) State the role of Vitamin **C** in the human body. (1 mark)

14. Explain the importance of the following in photosynthesis (3 marks)

(i) Light

(ii) Carbon (IV) oxide

(iii) Chlorophyll

15. An individual is of blood group **B** positive

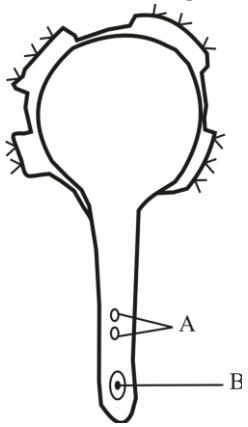
(a) Name the antigens in the individual's blood (2 marks)

(b) Give the reason why the individual cannot receive blood from a blood group **A** donor (2 marks)

16. State three functions of blood other than transport (3 marks)

17. State four applications of plant hormones in agriculture (4 marks)

18. The diagram below illustrates a growing pollen tube



(a) Name the part labeled **B** (1 Mark)

(b) Explain the role of the parts labeled **A** (2 marks)

19. The diagram below illustrates a response by a certain plant

(a) Name the type of response (1 mark)

(b) Explain how the response illustrated above occurs (3 marks)

20. Give reason why each of the following is important in the study of evolution
(a) fossil records (2 marks)

(b) comparative anatomy (2 marks)

21. State the theories of evolution proposed by the following scientists (2 marks)
(i) Charles Darwin……

(ii) Jean Baptise de lamarch……

22. Name three types of chromosomal mutation (3 marks)

23. Give four reasons why water is significant in seed germination (4 marks)

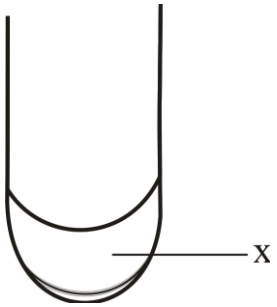
24. Explain two roles of diffusion in human beings (2 marks)

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

26. Explain the meaning of each of the following terms (2 marks)
(i) Crenated cell

(ii) Flaccid cell

27 The diagram below represents regions of root tip.



(a) Name the two regions above **X** in an ascending order. (2 marks)

(b) State the function of the part labeled **X** (1 mark)

231/2
BIOLOGY
PAPER 2
(THEORY)
JULY/AUGUST 2016
TIME: 2 HOURS

NAKURU SUB COUNTY SECONDARY SCHOOLS TRIAL EXAMINATIONS - 2016
Kenya Certificate of Secondary Education

INSTRUCTIONS TO CANDIDATES

- Write your name and index number in the spaces provided above
- Sign and write the date of examination in the spaces provided above
- This paper consists of **TWO** sections A and B.
- Answer **ALL** questions in section A in the spaces provided
- In section B answer **question 6(compulsory**) and either question 7 or 8in the spaces provided after question 8
- This paper consists of 8 printed pages
- Candidates should check the question paper to ascertain that all the pages are printed and that no questions are missing

FOR EXAMINERS USE ONLY

Section	Question	Maximum score	Candidate score
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
B	6	20	
	7	20	
	8	20	
	TOTAL	**80**	

SECTION A (40 MARKS)

1. 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 of the wrinkled seeds.

   Using letter**R** to represent the dominant gene. State

   (a) The genotype of parents if plant with round seeds was heterozygous (2 marks)

……

……

…….....

(b) Thegametes produced by the round and wrinkled seed parents. (2 marks)

Round seed parent……..

Wrinkled seed parent …….

(c) The genotype and phenotype of **F1** generation. Show your working (3 marks)

……

……

…….....

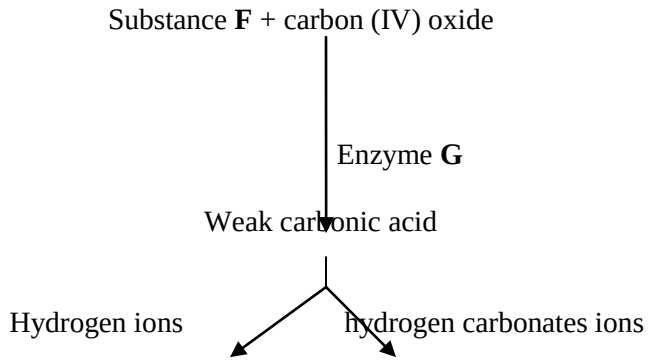
……

(d) What is a test cross (1mark)

…….....

……

2. The diagram below illustrate the role played by red blood in the transportation of carbon (IV) oxide



(a) Other than carbon(IV) oxide transportation in the red blood cells, name the other form of carbon(IV) oxide transportation in humans (1 mark)

……..

(b)(i) Name substance **F**……..(1 mark)

(ii) Name the enzyme marked **G** and state its role in the reaction (2 marks)

G……

Role ……

(c) Explain why transportation of carbon (IV) oxide in red blood cells is advantageous (2marks)

……..

……

…….....

(d) Explain the role of calcium in blood clotting (2 marks)

……

……

…….....

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

……

…….....

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

……

……

…….....

b) How does the human eye obtain nutrients? (1 mark)

……

……

…….....

(c) Explain why the images that form in the blind spot are not perceived (2 marks)

……

……

……

4 An experiment was carried out to investigate the rate of reaction shown below.

Sucrose ⟶ Fructose + glucose.

For the products fructose and glucose to be formed, it was found that substance **K** was to be added and the temperature maintained at 37^{o}C. When another substance **L** was added, the reaction slowed down and eventually stopped.

(a) Suggest the identity of substance **K** and **L** (2 marks)

……

……

……

(b) Other than temperature, state three ways by which the rate of reaction would be increased (3 marks)

……

……

……

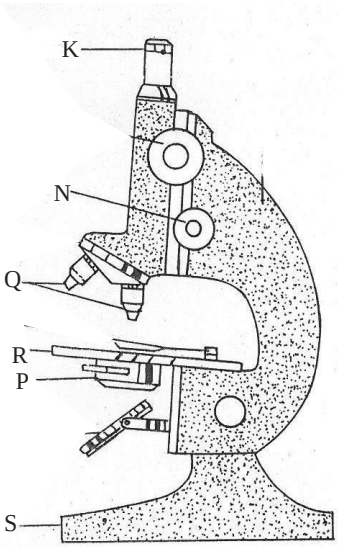
(c) Explain how substance **L** slowed down the reaction (3 marks)

……

……

……

5. The diagram below shows an instrument used in the laboratory.



(a) Name the apparatus shown above

…… .(1 mark)

(b) Label the parts Q , K and R (3 marks)

Q……

K……

R ……..

(c) What are the functions of parts **P, N** and**S.** (3 marks)

P……

N……..

S……..

(d) What is the formula of calculating linear magnification (1 mark)

……

……

……

SECTION B. (40 MARKS)

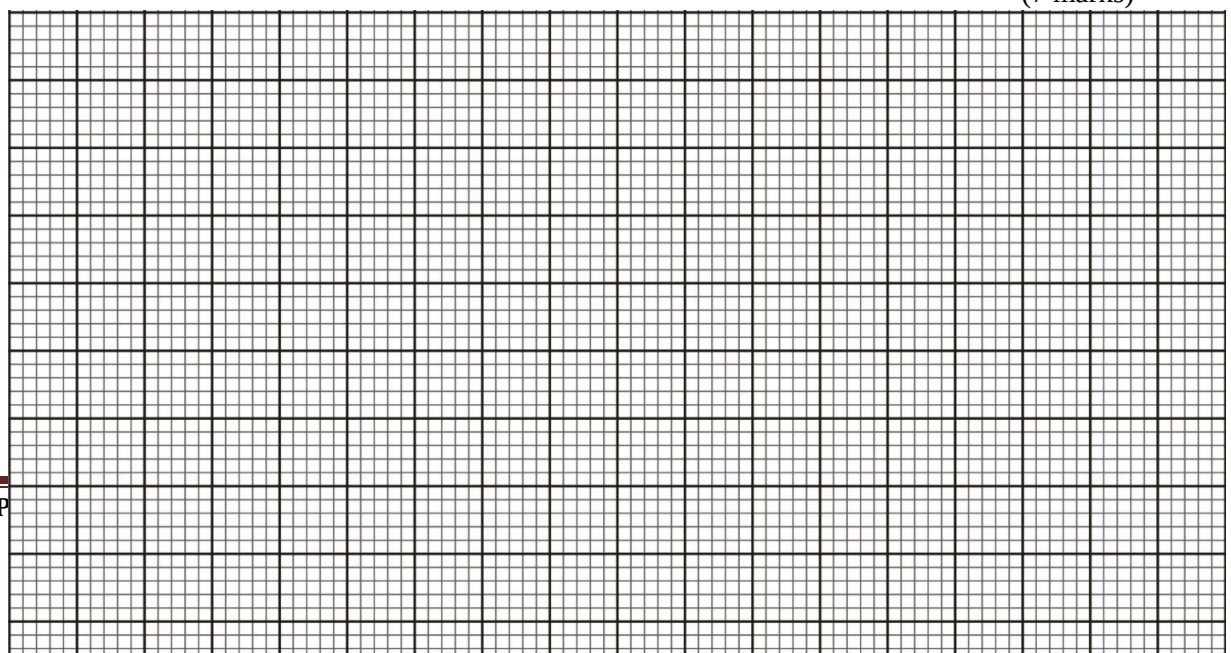
Answer question 6 (compulsory) and either question 7 or 8 in the spaces provided after question 8

6. Two persons **X** and **Y** drunk volumes of concentrated solution of glucose. The amount of glucose in their blood was determined at intervals. The results are shown in the table below.

Time(minutes)	Glucose level in blood(mg//100cm^3)	
	X	Y
0	87	84
15	112	123
30	139	170
45	116	188
60	100	208
90	95	202
120	92	144
150	88	123

(a) On the grid provided, plot graphs of glucose level in blood against time on the same axes

(7 marks)



(b) What was the concentration of glucose in the blood of **X** and **Y** at the 20th minute? (2 marks)

……

……

……

(c) Suggest why the glucose level in person **X** stopped rising after 30 minutes while it continued rising in person **Y**? (3 marks)

……

……

……

(d) Account for the decrease in glucose level in person **X** after 30 minutes and person **Y** after 60 minutes (3 marks)

……

……

……

(e) Name the compound that stores energy released during oxidation of glucose (1 mark)

……

……

……

f) Explain what happens to excess amino acids (4 marks)

……

……

……

……

……

……

7. Describe how the human kidney functions (20 marks)

8. Explain how abiotic factors affect plants (20 marks)

……

……

……

……

231/1
BIOLOGY
PAPER 1
JULY/AUGUST 2016
TIME: 2 HOURS

NYANDARUA COUNTY MID – YEAR EXAM – 2016

Kenya Certificate of Secondary Education (K.C.S.E)

231/1
BIOLOGY
PAPER 1
JULY/AUGUST 2016
TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

- *Write your Name and Index number in the spaces provided above*
- *Sign and write the date of examination in the spaces provided. Answer all the questions in the spaces provided.*
- *Additional pages must not be inserted.*
- ***This paper consists of 8 printed pages. Candidates should check the question paper to ascertain all the pages are printed as indicated and no questions are missing.***

For examiners use only

Question	Maximum score	Candidates score
1-31	80	

Answer all questions in this section in the spaces provided

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

   ……
   ……
   ……

2. Name the causative agent of the following diseases.

   a) Cholera. (1 rnk)

   ……
   ……

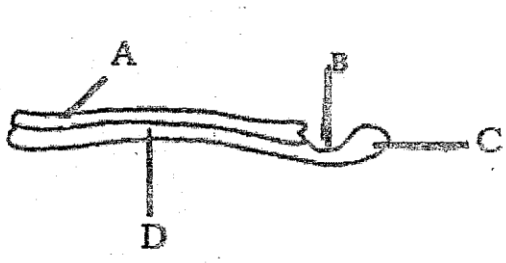
   b) Amoebic dysentery. (1 mk)

   ……
   ……

3. What is a test-cross. (1 mk)

   ……
   ……

4. The diagram below represents bones obtained from a mammal.



   a) Name bone labeled A. (1 mk)

   …….

   b) Name;

   (i) The bone which articulates with the bone labeled A and D at the notch labeled B. (1 mk)

   ……
   ……

   (ii) Joint formed by the three bones in b(i) above. (1 mk)

   ……
   ……

   c) State the function of the structure labeled C. (1 mk)

   ……
   ……

5. Under similar conditions, a man requires more energy than a woman of the same age. Explain.(2 mks)

……
……
……
……

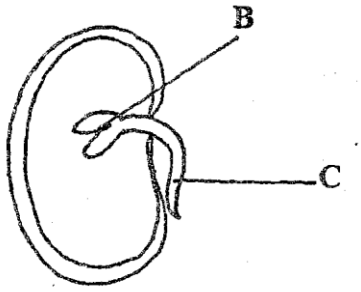
6. State two uses of a pair of forceps in biology. (2mks)

……
……
……

7. State three differences between tropism and Nastism. (3mks)

……
……
……
……

8. The diagram below shows a section through a seed of a dicotyledon.
What do parts B and C develop into after germination. (2 mks)



……
……
……
……

9. State three adaptations of trachioles to their functions.
(3 mks)

……
……
……
……
……
……

10. Name the organelle which carries out the following function.
    i. Get rid of excess water in unicellular organism. (1 mk)

    ……
    ……

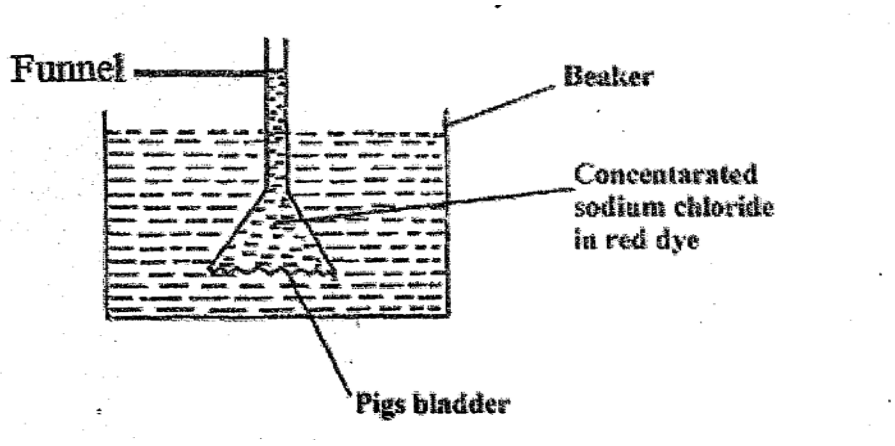
    ii. Destroys diseased organelles. (1 mk)

……
……

iii. Forms secretory vesicles.
(1 mk)
……
……

11. (a) Define adaptive radiation as used in evolution. (2 mks)
……
……
(b) Name the type of evolution that results from adaptive radiation. (1 mk)
……
……

12. The diagram-below represents an experiment set up. The set up was left for two hours. The level of the solution in the funnel increased while the red dye was seen in the beaker.



(a) Identify process that led to;
(i) Increase in the solution level in the funnel. (1 mk)
……
……
(ii) Appearance of red dye in the beaker. (1 mk)
……
……
(b) State the role of pigs bladder. (1 mk)
……
……

13. Explain how the following prevent self pollination.
(i) Dioecism (1 mk)
……
……
(ii) Self sterility (1 mk)

……
……

14. An animal was found to have a large Bowman's capsule and a short loop of Henle. Describe how these features affect amount of urine produced by this animal (4 mks)
……
……
……

15. State three differences between diplopoda and chilopoda. (3 mks)
……
……
……
……

16. Name three support tissues in plants. (3 mks)
……
……
……
……

17. DDT is a pesticide which used to be sprayed on crops to kill insects, Run off from fields could carry DDT into lakes and rivers. The chain below shows the food chain in an ecosystem where DDT was used. The numbers in brackets are the concentration of DDT in tissues of the organism in parts per million.

Photosynthetic ----------→Herbivorous----------→ Carnivorous------→Fish eating birds

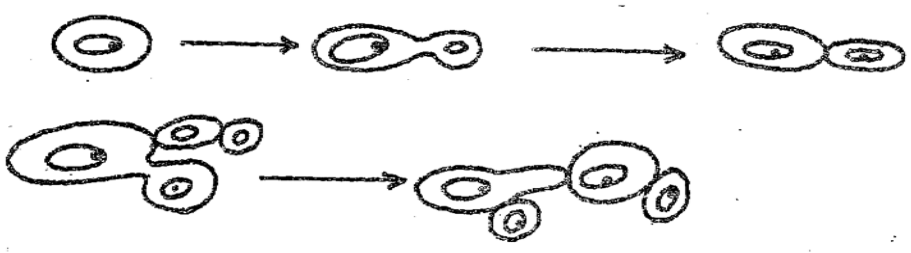
(15) (510) (1530) (13770)

(a) Fish eating birds died from DDT poisoning explain why. (2 mks)
……
……
……

(b) Many insect population became resistant to DDT. Explain how. (2 mks)
……
……
……

18. State the functions of the following parts of a light microscope.
i) Diaphgram. (l mk)
……
……
ii) Condenser. (1 mk)
……
……

19. The diagram below represents a biological process in yeast cells.



(i) Name the process occurring. (1 mk)

……

(ii) Briefly explain how the process occurs in nature. (3 mks)

……

……

……

……

……

……

20. State two structural differences between Xylem vessels and tracheids. (2 mks)

……

……

……

……

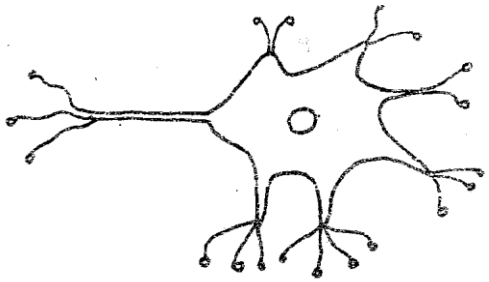
……

……

……

……

21. The diagram below represents a neurone.



(i) Identify the type of neurone. (1 mk)

……
……

(ii) State the function of the neurone. (1 mk)
……
……
(iii) State why the neurone is non-mylianated. (1 mk)
……
……

22. Describe the changes that occur in the rib cage and diaphgram during inspiration. (3 mks)
……
……
……
……

23. A plant was observed to have parallel venation and fibrous root system. Name.
(i) Subdivision of this plant. (1 mk)
……
……
(ii) Class to which the plant belongs. (1 mk)
……
……

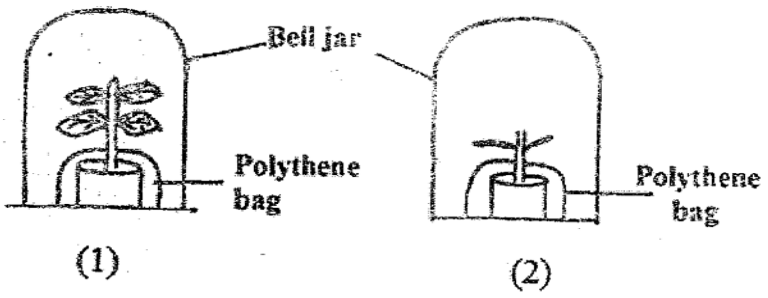
24. Explain why Darwin's theory of Natural selection is accepted as a theory in which evolution occurs.

(2 mks)
……
……
……
……

25. Which genetic disorder is caused by lack of a gene which causes production of Melanin. (1mk)
……
……

26. Explain what happens when two animals occupy the same niche in an ecosystem. (2 mks)
……
……

27. The diagram below was set up to investigate a certain biological process.



(a) What physiological process was being investigated. (1 mk)

……

(b) What observations were made in each set up 1 and 2. (2 mks)

……

……

……

……

(c) What was the purpose of the set up 2. (1 mk)

……

……

28. Name the type of skeleton found in insects. (1 mk)

……

……

29. Name the type of muscles found in the following parts of the body.

(i) Intestines. (1 mk)

……

……

(ii) Thighs. (1 mk)

……

……

(iii) Heart. (1 mk)

……

……

30. (a) Name the end products of anaerobic respiration in animals. (1 mk)

……

……

(b) State two roles of the tongue in digestion. (2 mks)

……

……

31. Animals which have closed circulatory system are more active than those with open circulatory system. Explain. (2mks)

……
……
……
……
……
……

231/2
BIOLOGY
PAPER 2
JULY/AUGUST 2016
TIME: 2 HOURS

NYANDARUA COUNTY MID – YEAR EXAM – 2016

Kenya Certificate of Secondary Education (K.C.S.E)

231/2
BIOLOGY
PAPER 2
JULY/AUGUST 2016
TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

- *Write your Name and Index number in the spaces provided above*
- *Sign and write the date of examination in the spaces provided. Answer all the questions in the spaces provided.*
- *This paper consists of two sections A and B.*
- *Answer all questions in section A in the spaces provided after each question.*
- *In section B answer question 6 (compulsory) and either question 7 or 8 in the spaces provide.*
- ***This paper consists of 8 printed pages. Candidates should check the question paper to ascertain all the pages are printed as indicated and no questions are missing.***

FOR EXAMINERS USE ONLY

SECTION	QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
A	**1**	**8**	
	2	**8**	

	3	**8**	
	4	**8**	
	5	**8**	
B	**6**	**20**	
	7	**20**	
	8	**20**	
	TOTAL		

SECTION A (40 MARKS)

Answer all questions in this section in the spaces provided

1. a) Apart from diffusion name two other methods of excretion in plants (2 mks)

……

……

……

……

b) State two economic importance of the following products of excretion in plants.

(i) Quinine. (1 mk)

……

……

(ii) papain. (1 mk)

……

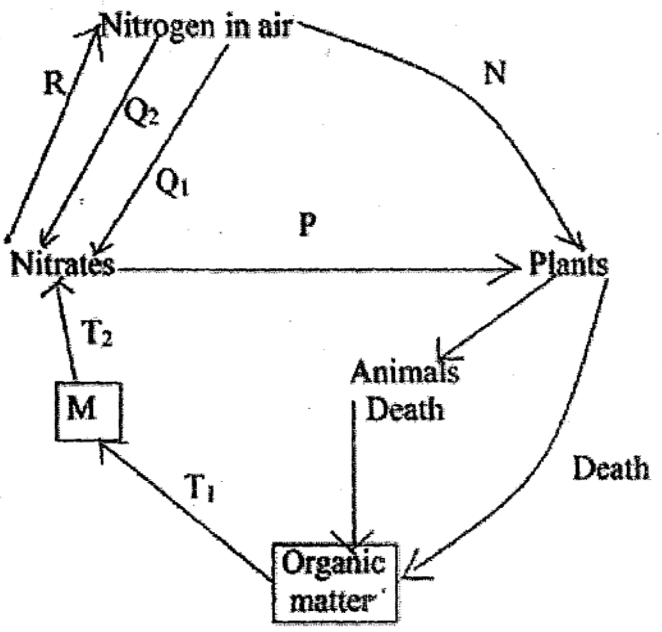
……

c) Describe what happens in the liver when blood level is above normal. (4 mks)

……

……

2. The diagram below represents the nitrogen cycle.



(a) Name the process labeled (3 mks)

P……..

T1……

.

T2……

.

(b) Name the organism that converts M into Nitrates (1 mk)

……

……

(c) Name the organism in plants which promote process N. (1 mk)

……

……

(d) State the relationship the organism stated in C above and the plant. (1 mk)

……

……

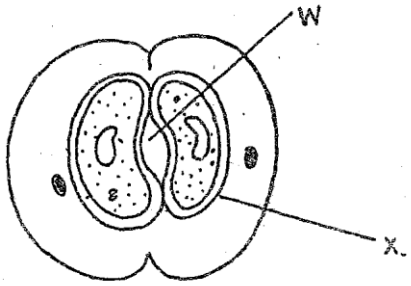
(e) How would excess pesticides in the soil interfere with process N. (1 mk)

……
……

(f) If Ql represents fixation of nitrogen by free living bacteria, what is represented by Q2 (l mk)

……
……

3. (a) The diagram below shows part of a plant tissue.



(i) Name cell labeled X and part labeled W. (2 mks)

……
……

(ii) State two adaptations of cell labeled X to its functions. (2 mks)

……
……
……
……

(b) (i) Name the kingdom to which the above structure is found. (1 mk)

……
……

(ii) State three differences between Bryophyta and Pteriodophyta. (3 mks)

……
……
……
……
……
……

4. A cross between black bull and white cow produces a calf with black and white spots. Using letter B for Black and W to represent white trait

   (a) Work out the possible genotypes of a calf resulting from a cross between a black bull and a white cow. (4 mks)

   (b) State the reason why the calf had black and white spots. (1 mk)

   ……
   ……

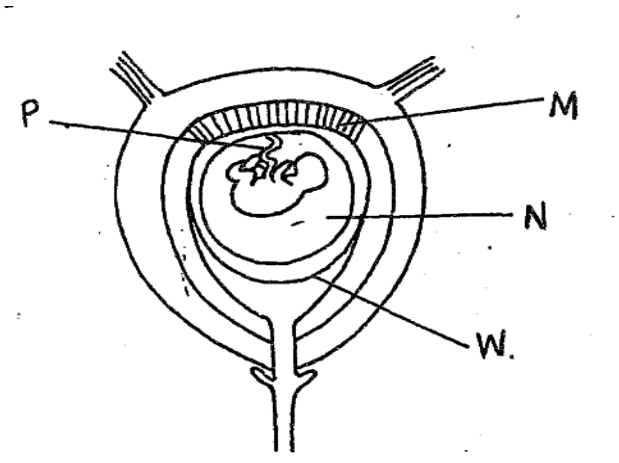
   (c) What is meant by the term allele. (1 mk)

   ……
   ……

   (d) State two characteristic of an individual with Down's syndrome. (2 mks)

   ……
   ……

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



   (a) Name the part labeled W. (1 mk)

   ……
   ……

(b) (i) Name the type of blood vessels found in the structure labeled P. (2 mks)

……
……

(ii) State the differences in composition of blood found in vessel named in b (i) above.(2mks)

……
……

(c) Name two features that enable the structure labeled M carry out its function. (2 mks)

……
……
……
……

(d) State the role of part labeled N. (1 mk)

……
……

SECTION B

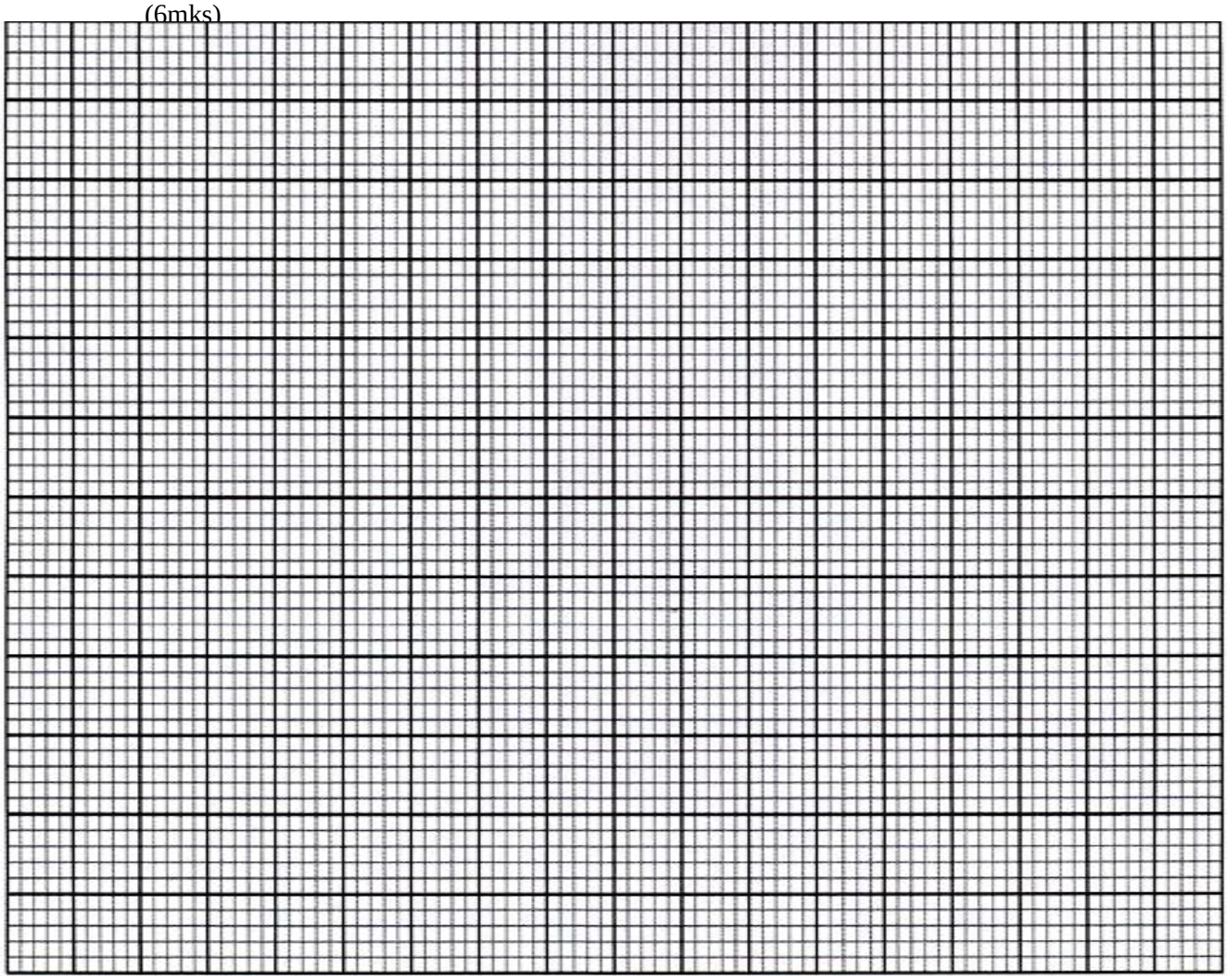
Answer question 6 (compulsory) and either question 7 or 8 in the spaces provided after question 8.

6. An experiment was carried out to investigate plasmolysis in Onion epidermal cells. The cells were placed in different concentrations of sodium chloride solution. The percentage plasmolysed cells was determined after 30 minutes. The results were shown in the table below.

Salt concentration g, per $100cm^3$ (%)	0.30	0.35	0.40	0.45	0.50	0.55	0.60
Onion epidermal cells plasmolysed. (%)	0	10	25	55	78	92	100

(a) (i) On the grid provided plot a graph of plasmolysed epidermal cells against concentration.

(6mks)



(ii) At what concentration of salt solution was the proportion of plasmolysed cells equal to non-plasmolysed cell. (1 mk)

……

……

(iii) State the salt concentration at which 60% of the cells were plasmolysed. (1 mk)

……

……

(b) Account for the results obtained at

(i) 0.30% salt concentration. (3 mks)

……

……

……

……

(ii) 0.60% salt concentration. (3 mks)

……

……

……

……

(c) (i) Define the term plasmolysis. (1mk)

……

……

(ii) What would happen to animal cells if they are placed at 0.55% concentration for 30 minutes. (1mk)

……

……

(iii) Explain your answer in c (ii) above. (2 mks)

……

……

(d) Describe the relationship between concentration of the salt solution and the percentage of plasmolysed cells. (1 mk)

……

……

……

(e) What term would best describe a plant where 100% of its cells were plasmolysed. (1 mk)

……

……

7. Describe the uptake and movement of water from the soil to the leaves of a tall plant till transpiration.

(20mks)

8. Describe the structure and functions of the various plants of a mammalian ear. (20mks)

231/1

BIOLOGY

PAPER 1

AUGUST/SEPTEMBER

(THEORY)

TIME: 2 HOURS

RARIEDA SUB-COUNTY POST MOCK JOINT EXAMS 2016

Kenya Certificate of Secondary Education (K.C.S.E)

BIOLOGY

PAPER 1

(THEORY)

INSTRUCTIONS TO CANDIDATES:

1. Write your **Name**, **Index Number** and **School** in the spaces provided above.
2. **Sign** and write the **date** of examination in the spaces provided above.
3. Answer **all** the questions in the spaces provided.
4. Answers must be written in the spaces provided in the question paper.
5. Additional pages must not be inserted.
6. Check the question paper to ascertain that all the pages are printed and that no

questions are missing.

FOR EXAMINER'S USE ONLY:

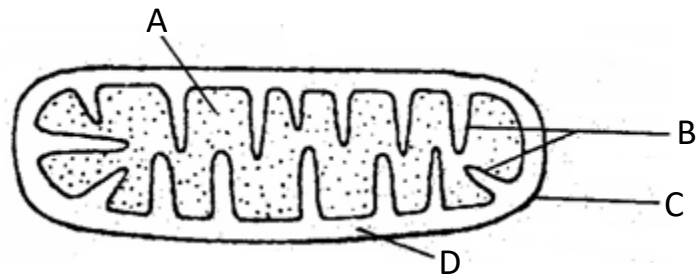
Question	Maximum Score	Candidate's Score
1 – 26	**80**	

This paper consists of 11 printed pages. The Candidate should check to ascertain that all pages are printed as indicated and that no questions are missing

1. Name the causative agent of cholera. (1 mark)

_____

2. The diagram **below** represents a cell organelle.



(a) Identify the organelle. (1 mark)

_____

(b) Name the part labelled **B**. (1 mark)

_____

(c) State the function of part labelled **A**. (1 mark)

_____

_____

_____

3. State the functions of the following parts of a light microscope.

(a) Condenser. (1mark)

_____

_____

_____

(b) Diaphragm. (1 mark)

_____

_____

4. (a) Explain **three** ways in which a red blood cell is adapted to its function. (3 marks)

_____

_____

_____

_____

(b) In which form is carbon (IV) oxide transported. (1 mark)

_____

_____

5. State the functions of the following organelles.

(i) Centriole. (1 mark)

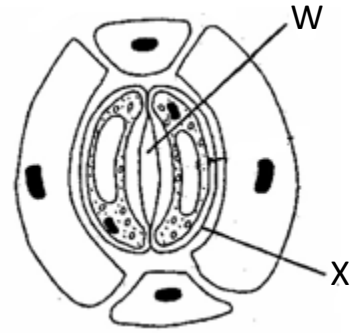
_____

_____

(ii) Nucleolus. (1 mark)

_____

6. The diagram **below** shows part of plant tissue.



(a) Name cell labelled **X** and part labelled **W**. (2 marks)

X _____

W _____

(b) State **two** adaptations of cell labelled **X** to its function.

_____

_____

_____

_____

7. (a) Differentiate between hypogeal germination and epigeal germination. (2 marks)

_____

_____

_____

_____

(b) State **two** causes of dormancy in seed. (2 marks)

_____

_____

_____

_____

8. (a) Define polyploidy. (1 mark)

_____

_____

_____

(b) Name **three** disorders resulting from gene mutations. (3 marks)

_____

_____

_____

_____

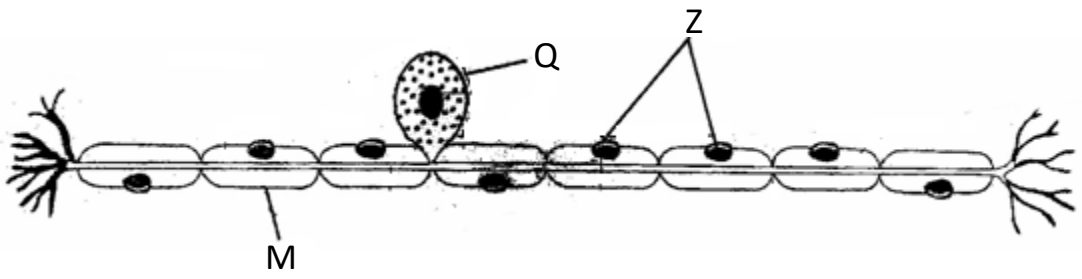
9. (a) Distinguish between homologous and analogous structure. (2 marks)

_____

(b) Explain the term continental drift as used in evolution. (2 marks)

_____

10. The diagram **below** represents a sensory cell.



(a) Identify with a reason the type of neurone above. (1 mark)

_____

Reason: (1 mark)

_____

(b) Name parts labelled. (2 marks)

Q _____

Z _____

11. (a) Name **three** supportive tissues in plants. (3 marks)

(i) _____

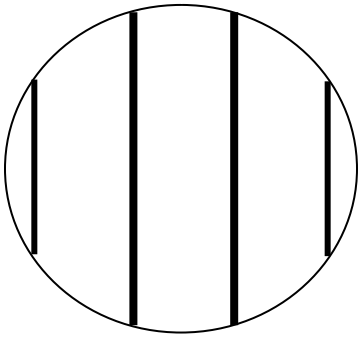
(ii) _____

(iii) _____

(b) Name the type of muscles found in the gut. (1 mark)

_____

12. A form one student trying to estimate the size of onion cells observed the following on the microscope's field of view.



(a) Define the term resolving power. (1 mark)

_____

(b) If the student counted 20 cells across the field of view calculate the size of one cell in micrometers. (2 marks)

_____

13. (a) Distinguish between transpiration and guttation. (2 marks)

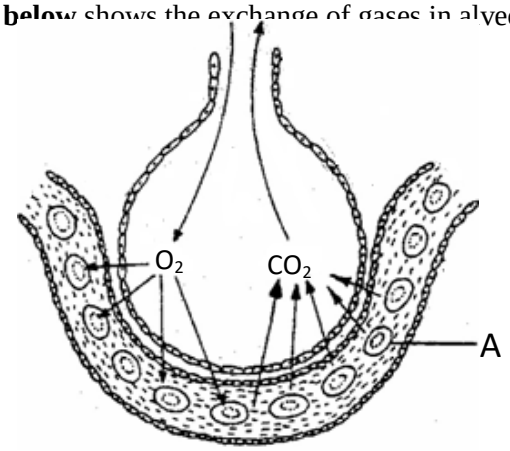
_____

_____

(b) State **two** importance of guttation in hydrolytes. (2 marks)

_____

14. The diagram **below** shows the exchange of gases in alveolus.



(a) State how the alveoli are adapted to their function. (3 marks)

_____

(b) Name the cell labelled **A**. (1 mark)

_____

15. (a) Distinguish between respiratory quotient and oxygen debt. (2 marks)

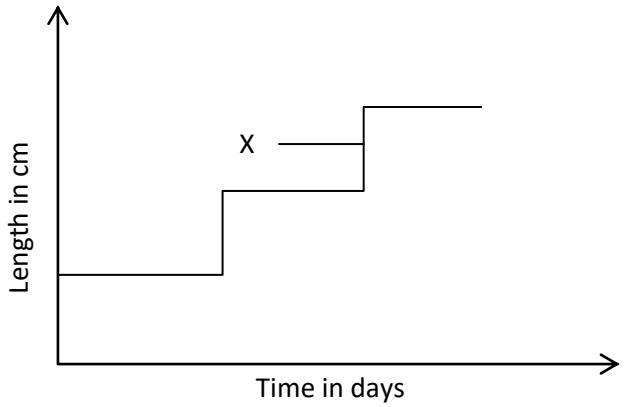
_____

_____

(b) Name the site where anaerobic respiration occurs in the cell. (1 mark)

_____

16. Study the graph **below** and answer the questions that follow.



(a) What is the name given to the type of graph? (1 mark)

_____

(b) What is the name used to describe point **X**. (1 mark)

_____

(c) State the importance of part **X**. (1 mark)

_____

_____

(d) Name the phylum in which the graph represented in above occurs. (1 mark)

_____

17. (a) Define the term natural selection. (1 mark)

_____

(b) Name **three** evidence of organic evolution. (3 marks)

_____

_____

_____

18. State **one** adaptation of the following parts of mammalian eye.

(i) Fovea centralis. (1 mark)

_____

(ii) Sclera. (1 mark)

_____

(iii) Cilliary body. (1 mark)

_____

19. Name the cartilage found between vertebrae of the vertebral column. (1 mark)

_____

20. (a) Differentiate between gaseous exchange and ventilation. (2 marks)

_____

_____

_____

(b) Name the respiratory sites of the following:

(i) Fish (1 mark)

_____

(ii) Insects (1 mark)

_____

21. (a) Name **two** cardiovascular diseases. (2 marks)

_____

_____

(b) If the nerve supply to the heart of a mammal is severed the rythymic heart contraction and relaxation will go on and heart continues to beat. Explain why. (2 marks)

_____

_____

22. Name **two** major branches of Biology. (2 marks)

_____

_____

23. (a) State the functions of the following apparatus.

(i) Bait trap. (1 mark)

_____

(ii) Pooter. (1 mark)

_____

24. State **two** structural adaptations of veins to their function. (2 marks)

_____

25. Name the process that results to formation of tissue fluid. (1 mark)

_____

26. What is serum? (1 mark)

231/2

BIOLOGY

PAPER 2

AUGUST/SEPTEMBER

(THEORY)

TIME: 2 HOURS

RARIEDA SUB-COUNTY POST MOCK JOINT EXAMS 2016

Kenya Certificate of Secondary Education (K.C.S.E)

BIOLOGY

PAPER 2

(THEORY)

INSTRUCTIONS TO CANDIDATES

- *Write your name, school and index number in the spaces provided above.*
- *This paper consist of **TWO** sections; **A** and **B**.*
- *Answer **all** the questions in the section **A** in the spaces provided.*
- *In section **B** answer Question **6 (compulsory)** and either question **7** or **8** in the space provided after question **8**.*

- *Check to ascertain that all pages are printed and that no questions are missing.*

FOR EXAMINER'S USE ONLY

Section	Question	Maximum Score	Candidates Score
A	1	8	
	2	8	
	3	8	
	4	8	

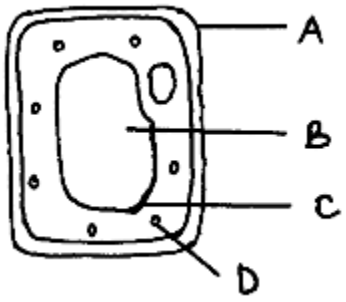
	5	**8**	
B	**6**	**20**	
	7	**20**	
	8	**20**	
Total Score		**80**	

This paper consists of 8 printed pages. The Candidate should check to ascertain that all pages are printed as indicated and that no questions are missing

SECTION A: (40 MARKS)

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

1. Examine the diagram **below** and use it to answer the questions that follow.



(a) Name the parts labeled. (3mks)

B

_____

C

_____

D

_____

(b) What is substance which makes up part labeled **A**? (1mk)

_____

(c) Name the process by which mineral salts move into structure **B**. (1mk)

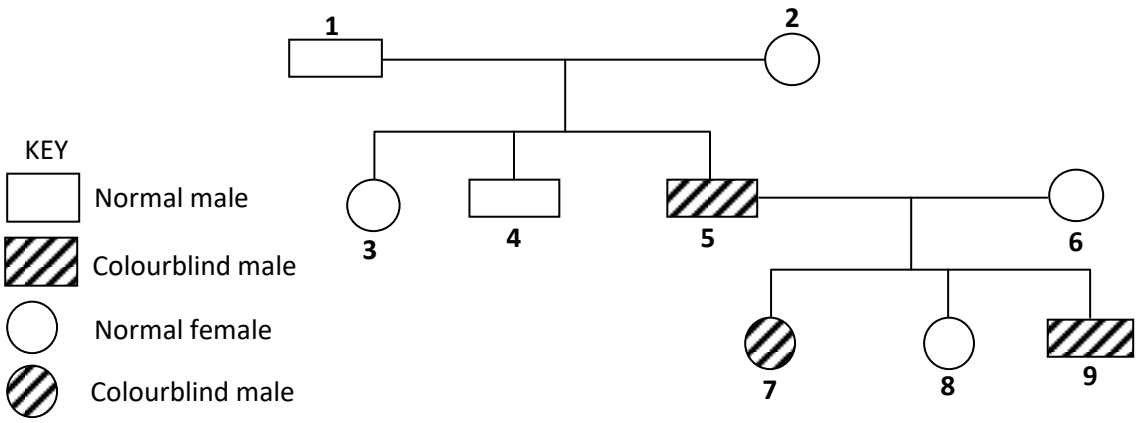
_____

(d) Explain what happens when a red blood cell is put in distilled water. (3mks)

_____

_____

2. The figure **below** is a pedigree showing the inheritance of colourblindness, a disease transmitted through a recessive gene located on the X-chromosome.



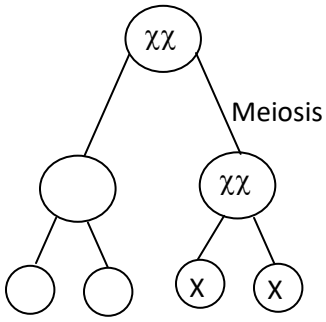
(a) Using the symbol N for normal gene and n for colourblind gene, write down the genotypes
of parents **1** and **2**. (2mks)

_____

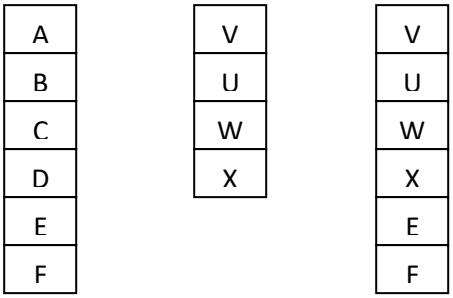
(b) Work out the possible genotypes of the children **3**, **4** and **5**. (4mks)

(c) The diagrams **below** illustrate some chromosome mutations.

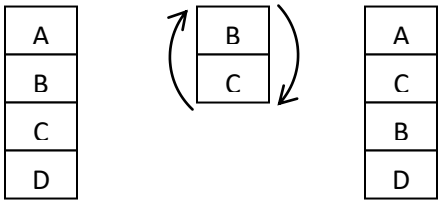
A



B



C



Identify the mutations. (3mks)

A

_____

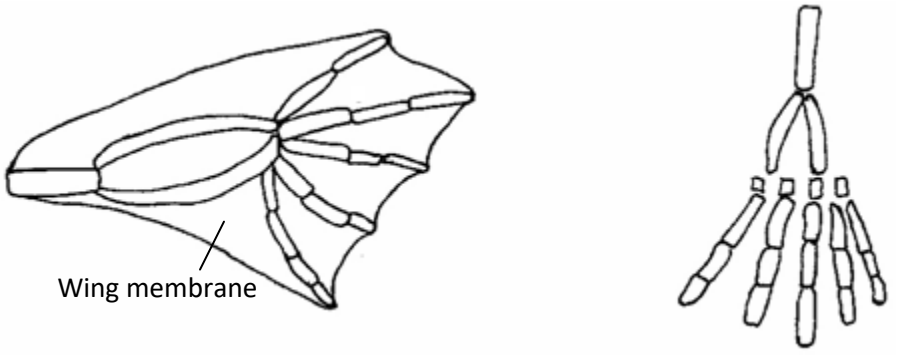
B

_____

C

_____

3. The diagram **below** shows structures of the bat wing and human arm.



(a) These structures are thought to have same ancestral origin. State **one** structural similarity and **one** adaptational difference between the two.

(i) Structural similarity. (1mk)

_____

(ii) Adaptational difference. (2mks)

_____

(b) Give **two** other examples of structures in nature that show the type of evolution as in (a) above. (2mks)

_____

____

_____

____

(c) Distinguish between the terms ‘chemical evolution’ and ‘organic evolution’. (2mks)

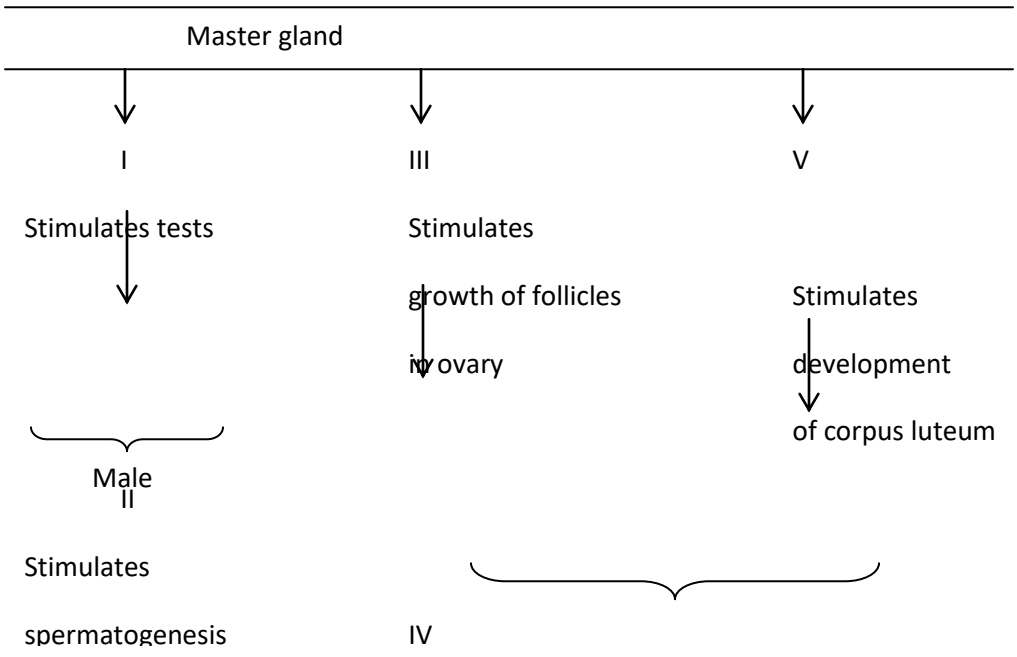
_____

(d) What is the study of fossils called? (1mk)

_____

____

4. The diagram **below** represents some hormones, their sources and functions in a mammal.



(a) Identify the gland described as master gland. (1mk)

_____

(b) Name the hormones:- (4mks)

II

_____

_

III

_____

V

_____

__

VI

_____

(c) Describe the consequences of deficiency of hormone **II** in man. (2mks)

_____

(d) Other than stimulate development of uterine wall, suggest two other functions of hormone

VI. (2mks)

_____

5. Ascaris lumbricoides is an endoparasite.

(a) Name the genus to which it belongs. (1mk)

_____

(b) State the habitat of the organism. (1mk)

_____

(c) State **three** ways in which the organism is adapted to living in its habitat. (3mks)

_____

(d) Mention **three** ways of preventing spread of the parasite. (3mks)

_____

_____

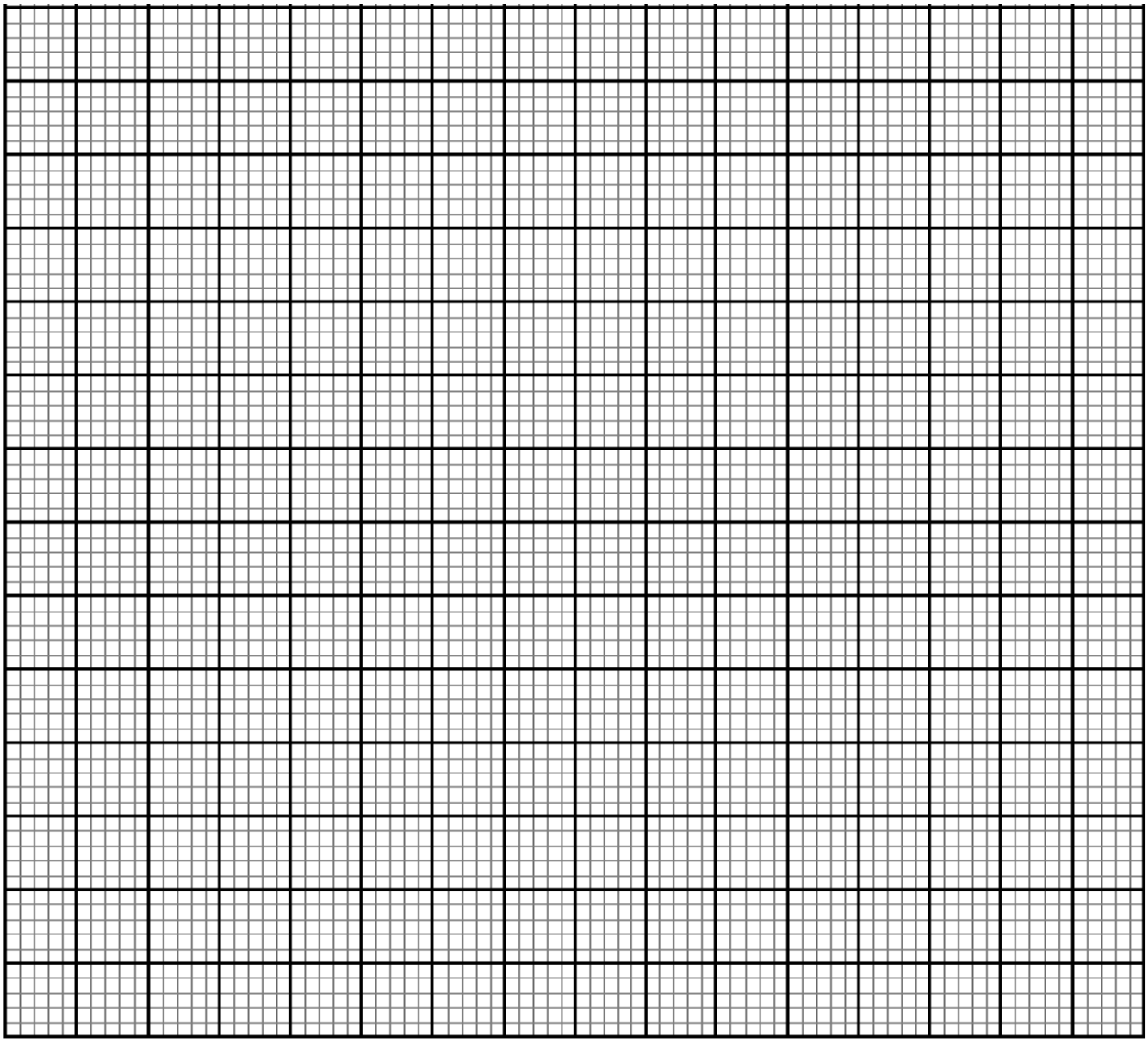
SECTION B: (40 MARKS)

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 °C	Urine cm^3/hr	Sweat cm^3/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 graph, plot the quantities of urine and sweat produced against the external temperature.
(7mks)



(b) At what temperature 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)

_____

(d) Explain the observation made on the amount of urine produced as the temperature increases. (3mks)

_____

__(e) How is the skin adapted for temperature regulation? (6mks)

_____

__

7. Describe the structural adaptations of the mammalian heart to its function. (20mks)

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

231/1
BIOLOGY
PAPER 1
JUNE-2016
TIME: 2 HOURS

CENTRAL YEARLY MEETING OF FRIENDS (CYMF) -2016
Kenya certificate of Secondary Education

231/1
BIOLOGY
PAPER 1

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. *Answer **all** the questions in the spaces provided.*
4. *Mathematical tables and silent electronic calculators may be used.*
5. *All working must be clearly shown where necessary.*
6. *Candidates should check the question paper to ascertain that all the pages are printed as indicated and no question is missing.*

FOR EXAMINER'S USE ONLY

QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
1-24	80	

This paper consists of 9 printed pages Check the Question paper to ensure that all pages are printed as indicated and no question are missing.

SECTION A

(Answer all questions in this question paper in the spaces provided)

1. (a)What is meant by the term taxonomy? (1mk)

……

……

……

(b)When are two organisms considered to belong to the same species. (2mks)

……

……

……

2. State three activities of the cell that are control by the nucleus (3mks)

……

……

……

……

3. Distinguish between haemolysis and plasmolysis . (2mks)

……

……

……

……

4. State two adaptation of leaves that maximize efficiency in trapping sunlight for photosynthesis.

(2mks)

……

……

……

5. State two roles of hydrochloric acid in the digestion of food. (2mks)

……

……

……

……

6. (a)Name the blood vessel that link arterioles with venues. (1mk)

……

……

(b)How are the blood vessels above situated to carry out their function. (2mks)

……

……

……

7. Explain how the following adaptations will reduce the rate of respiration. (2mks)

(a) Sunken stomata

……

……

(b) Leaf folding

……

……

8. (a) Name two structures for gaseous exchange in amphibians. (2mks)

……

……

……

(b) What is the effect of relaxation of diaphragm muscles during breathing in mammals. (3mks)

……

……

……

……

9. The equation below represents a process that occurs in plants

$C_6 H_{12} 0_6 \longrightarrow$ [B] + $C_2 H_5 OH$ + Energy

(a) Name the process (1mk)

……

Name the product B (1mk)

……

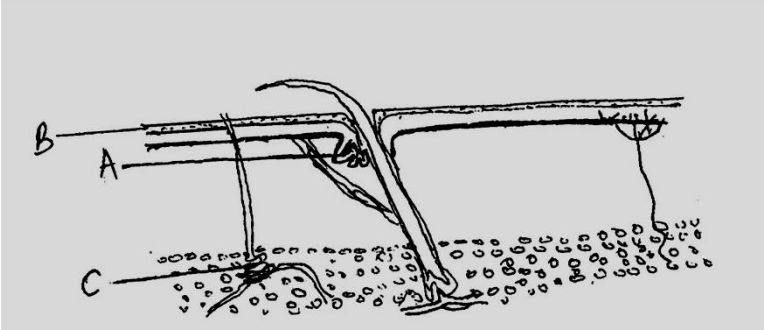
(b) State the economic importance of this process (2mks)

……

……

……

10. The diagram below represents a transverse section through human skin



(a)Name the structure labeled A and B (2mks)

A……

B……

(b)State the function of the parts labeled C (1mk)

……...

……...

(c) State two physiological changes that take place in a human skin in order to facilitate heat loss from the body.

(2mks)

……

……

……

……

11. (a)In what ways are fungal and plant cells similar. (2mks)

……

……

(b)List two external features that distinguish members of class Mammalia from other classes.

(2mks)

……

……

……

12. Name the disease caused by each of the following micro-organism. (2mks)

(a)Plasmodium falciparum

……

…….

(b)Entamoeba histolytica

……

……..

13. State how excessive use of agrochemicals affects large water bodies. (2mks)

……

……

……

14. (a)Distinguish between ecological niche and habitat. (2mks)

……

……

……

(b)Explain why the ecosystem is said to be a self sustaining natural unit. (2mks)

……

……

……

15. (a)Define the following terms in human reproduction. (2mks)

(i)Parturition

……

……

(ii)Inplantation

……

……

(b)Name the hormone involved in the development in the female secondary sexual characteristics. (1mk)

……

……

(c)Give one function of amniotic fluid during pregnancy. (1mk)

……

……...

16. (a)State two factors within the seed that causes seed dormancy. (2mks)

……

……

……

(b)Distinguish between epigeal and hypogeal germination. (2mks)

……

……

……

17. (a)Define the following terms. (2mks)

(i)Mutation

……

……

(ii)Discontinuous variation

……

……

(b)Hemophilia is more common in men than in women .Suggest reasons to account for this.

(2mks)

……

……

18. (a)State two evidences of evolution. (2mks)

……

……

……

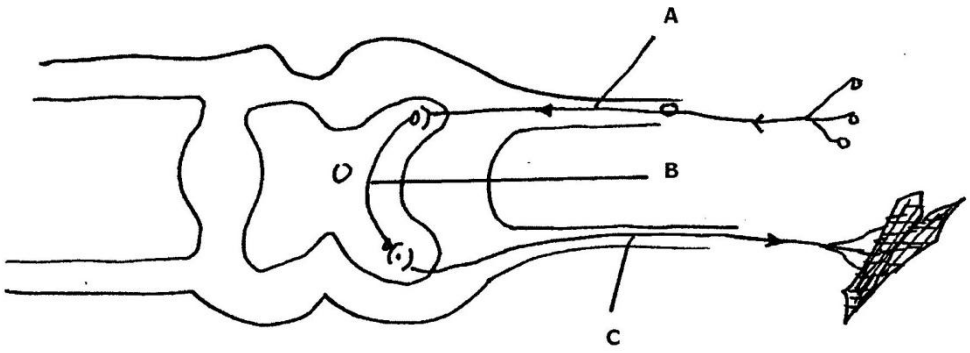
(b)Explain the concept adaptive radiation. (2mks)

……

……

……..

19. The diagram below represents a simple reflex ark



(

a)Name the parts labeled A, B and C (3mks)

A…….

B…….

C……

(b)What is the role of part A (1mk)

……

……

20. Give three structural differences between the skeletal muscles and smooth muscles. (3mks)

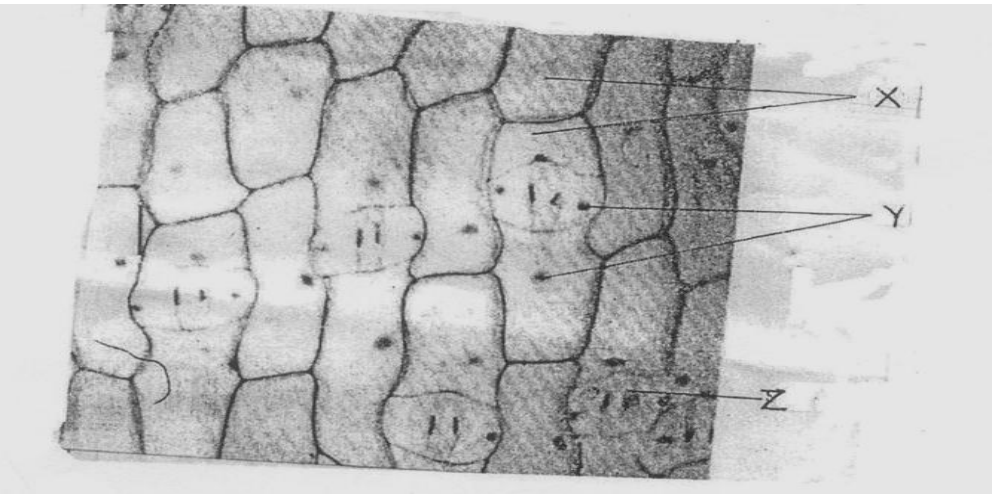
……

……

……

…… ……..

21. elow is a photomicrograph of the surface view of the lower epidermis of a monocotyledonous leaf



(a)Name the cells labeled X and Y. (2mks)

X……

Y……..

(b)State two roles of the part labeled Z in plants. (2mks)

……

……

……

……

22. State three structural adaptations of the proximal convoluted tubules to their functions. (2mks)

……

……

……

……

……

23. (a)What is parthenocarpy. (1mk)

……

……

(b)Which hormone can be used to induce parthenocarpy in unpollinated flowers. (1mk)

……

……

(c)What is the significance of slippery seeds in tomatoes during dispersal? (1mk)

……

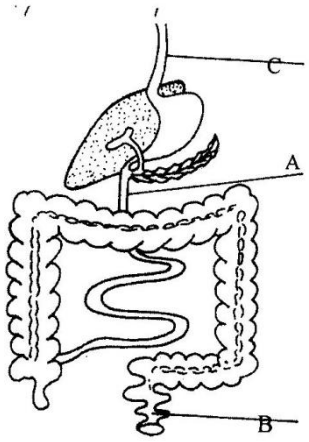
……

(d)Why is a maize grain considered as a fruit? (1mk)

……

……

24. The diagram below shows part of alimentary canal of a mammal



(i)Name the parts labeled A and C (2mks)

A……

C……

(ii)State the function of the part labeled B (1mk)

……

……

231/2
BIOLOGY
PAPER 2
JUNE- 2016
TIME: 2HOURS.

CENTRAL YEARLY MEETING OF FRIENDS (CYMF) -2016
Kenya Certificate of Secondary Examination (KCSE)

231/2
BIOLOGY
PAPER 2

.

INSTRUCTIONS TO CANDIDATES

- Write your **Name**, **School** and **Index** number in the spaces provided.
- Answer **all** questions in section **A** in the spaces provided. In Section **B**, answer question **6** (compulsory) and either **7** or **8** in the spaces provided after question **8**.
- Candidates should answer all the questions in **English**.

FOR EXAMINERS USE ONLY

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATES SCORE
SECTION A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
SECTION B	6	20	
	7	20	
	8	20	
TOTAL SCORE		**100**	

This paper consists of 8 printed pages Check the Question paper to ensure that all pages are printed as indicated and no question are missing.

SECTION A

(Answer ALL questions in this section)

1. (a) The table below shows the concentration of sodium and iodine ions in pond water and in the cells sap of water lettuce plant

	Sodium ion concentration	Iodine concentration
Ponch water	180	0.4
Cell sap	90	500

(a) Giving reasons name the process through which each of the ions is taken up by the plant

(i)Sodium ion (2mks)

……

……

……

(ii)Iodine ion (2mks)

……

……

……

(b) The lettuce plant was then treated with a chemical substance that inhibit the syntheisis of ATP

Giving a reason ,state which ion was affected by the treatment (2mks)

……

……

……..

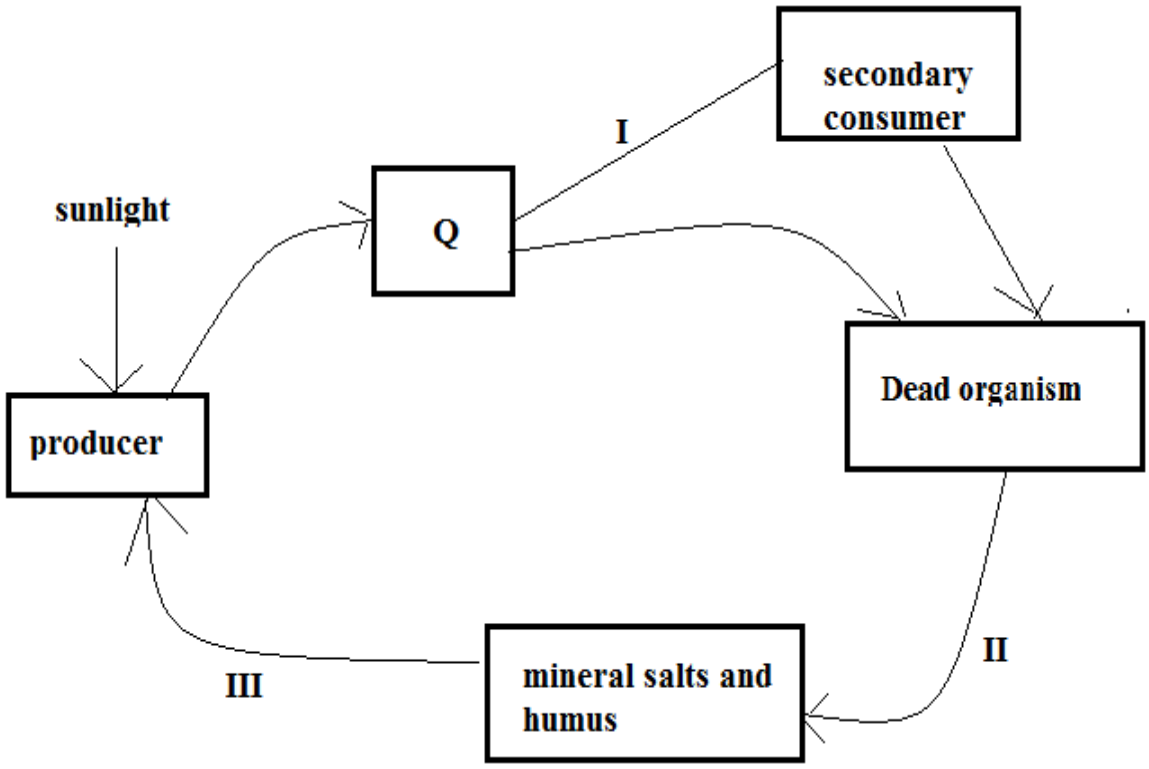
(c) Explain why fresh water fish cannot survive in marine habitat. (2mks)

……

……

……

2. The diagram below represents recycling of nutrients in a certain ecosystem



(a) Name the trophic level represented by Q. (1mk)

……...

(b) Name the process represented by; (3mks)

I……

II…….

III……

(c) Name the organism involved in process II. (1mk)

……

……..

(d) What would happen within the ecosystem if all the secondary consumers were eliminated?

(3mks)

……
……
……
……

3. In a garden of plants of the same species 705 plants have red flowers which 224 had white flowers.

(a) Work out the ratio of the red to white flowers (show your working). (2mks)

(b)(i) Using letter R to represent the dominant gene, work out a cross between F1 offspring and a white flowered plant (4mks)

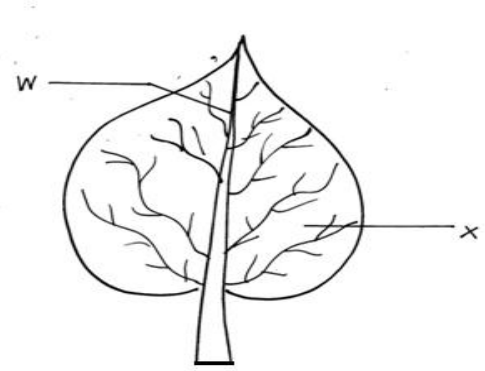
(ii)What is the genotypic ratio from the cross in (i) above? (1mk)

……
……
……

(c)What is meant by the term allele? (1mk)

……
……

4. The diagram below shows a leaf of a certain plant



(i)Name the parts labeled W and X (2mks)

……

……

……

(ii)State how the parts labeled W and X are adapted to their functions (2mks)

W……

……

X……

……

(B) (I)Using observable features only ,state the class to which the plant from which the leaf above was obtained belongs (1mk)

……

……..

(ii)Give two reseasons for your answer in (i) above (2mks)

……

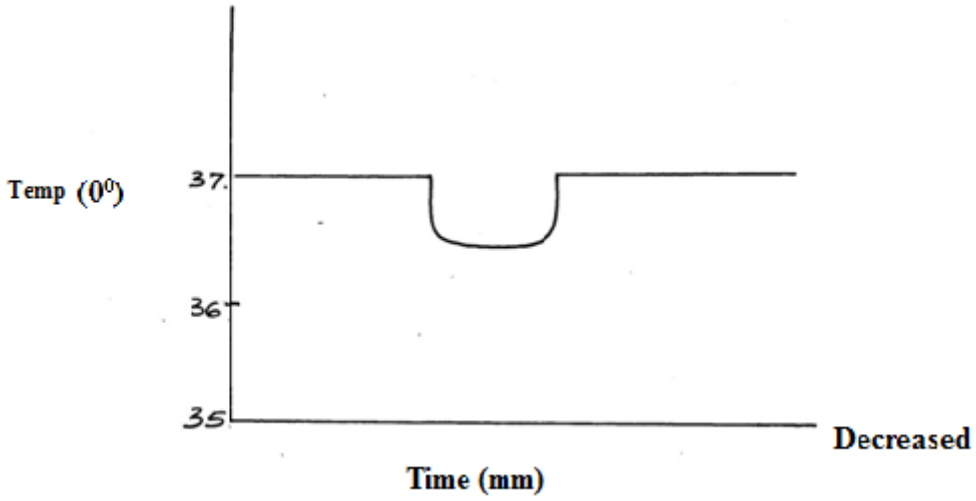
……

(iii)Give one climatic conditions that favors the growth of the plant from which the leaf was obtained (1mk)

……

……

5. The temperature of a person was taken before, during and after a cold bath. The results are shown in the graph below.



(a)Explain why the temperature decreased during bath. (3mks)

……

……

……

……

(b)What changes occurred in the skin that enabled the body to return to normal. (4mks)

……

……

……

……

……..

(c)Name the specific part that controls body temperature in humans. (1mk)

……

……

SECTION B (40MARKS)

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

6. In an experiment 900 viable seeds of a certain plant species were divided into groups of 100 seeds each. Each group of seeds was placed at different temperatures but same conditions of air and moisture. The percentage of germination was determined after 10 days .The table below shows percentage germination at normal temperatures.

Temp (0c	0	5	10	15	20	25	30	35	40
Percentage germination	0	0	2	5	16	50	84	30	2

(a)Using a suitable scale, draw a graph of percentage germination against temperature (^{0}c). (6mks)

(b)Account for percentage germination at

(i)5^0C (3mks)

……

……

……

(ii) 30^0C (3mks)

……

……

……

……

(iii) 40^0C (3mks)

……

……

……

……

(c)Explain the role played by each of the following factors in germination of seeds.

i) Water (3mks)

……

……

……

……

ii) Oxygen (2mks)

……

……

……..

7. Describe the various ways in which seeds and fruits are adapted for dispersal. (20mks)

8. (a)What is natural selection? (2mks)

(b)Discuss three examples of natural selection in action. (18mks)

……

……

……

……

……..

……

……

……

……

……

……..

……

……

……

231/1
BIOLOGY
PAPER 1
(THEORY)
JULY/AUGUST-2016
TIME: 2 HOURS.

SAMETA SUB-COUNTY JOINT EVALUATION TEST- 2016
Kenya Certificate of Secondary Education. K.C.S.E)

231/1
BIOLOGY
PAPER 1
(THEORY)
JULY/AUGUST-2016
TIME: 2 HOURS.

INSTRUCTIONS TO CANDIDATE'S

- Write your name and name of your school in the spaces provided above
- Sign and write the date of examination in the spaces provided.
- Answer all the questions in the spaces provided.
- This paper consists of 8 printed pages.
- Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing

For Examiners Use Only

Question	Maximum score	Candidate's score
1-29	**80**	

1. (a) What is metamorphosis? (1mk)

……

……

(b) What is the biological significance of metamorphosis to an insect? (2mks)

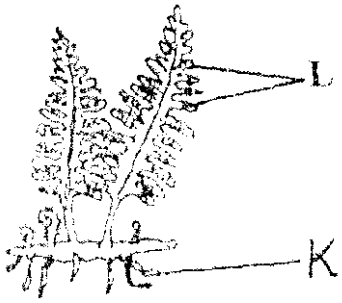
……

……

……

……

2. (a) The diagram below shows a certain plant.



(i) Name the division in the kingdom Plantae to which the plant belongs. (1 mk)

……

……

(ii) State the functions of structure labelled K and L (2mks)

……

……

……

……

3. Name two type of mutation represented below. (2mks)

(i) Original strand (ii) Mutated strand

……

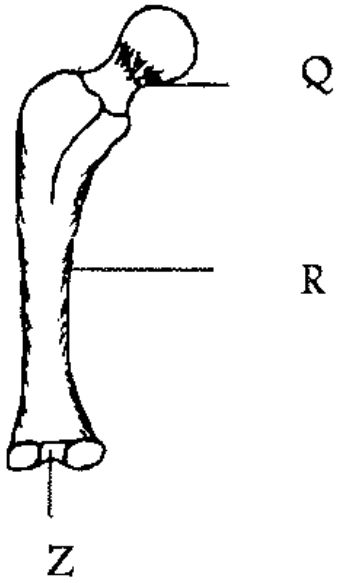
……

4. Name the organelles that perform the following function in a cell.

(i) Protein synthesis…… (1mk)

(ii) Transport of cell secretions …… (1mk)

5. The diagram below shows a bone of hind limb. Study it and answer the questions that follow.



(a) Name the bone (1mk)

(b) Name the parts labelled Q and R (2mks)

Q……..

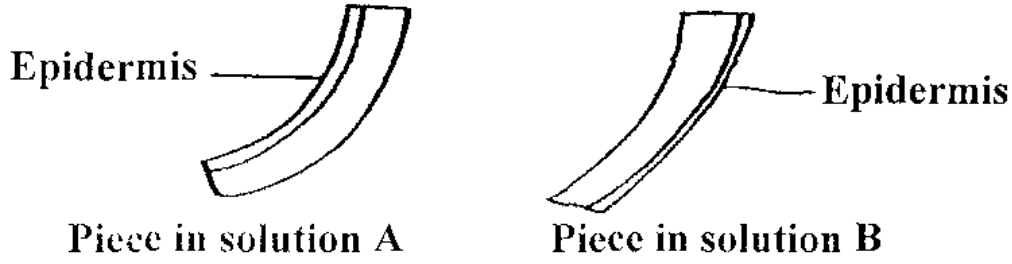
R……

(c) Name the structure that articulates with the part labelled Z and the joint formed? (2 mks)

Structure……

Joint……...

6. A 4cm straight piece of stem from piece from a herbaceous plant was split lengthwise into two similar pieces. the pieces were placed in sugar solutions of different concentrations for 30 minutes. Their appearance after 30 minutes is as shown below.



Account for appearance of the pieces iii solution A and B. (3mks)

7. The equal ion below represents a process that takes place in plants.

$6CO_2 + C_6H_{12}O_6 + 6O_2$

(i) Name the process. (1mk)

……

……

(ii) State two factors not shown in the equation that are necessary for the process to take place. (2mks)

……

……

……

……

8. (a) State two ways in which root hairs are adapted to their functions, (2mks)

……

……

……

……

(b) Explain how high humidity affects the rate of transpiration. (2mks)

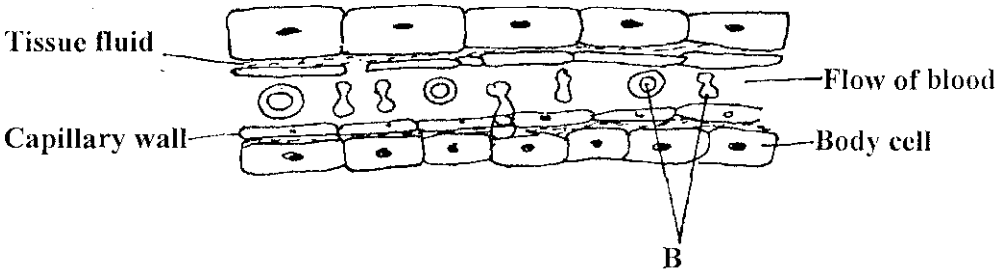
……

……

……

……

9. The diagram below shows the exchange site between circulatory system and body cells.



(i) Name the cells labelled B.

(lmk)

(ii) Name the gas that diffuses from B to the tissues cells. (1mk)

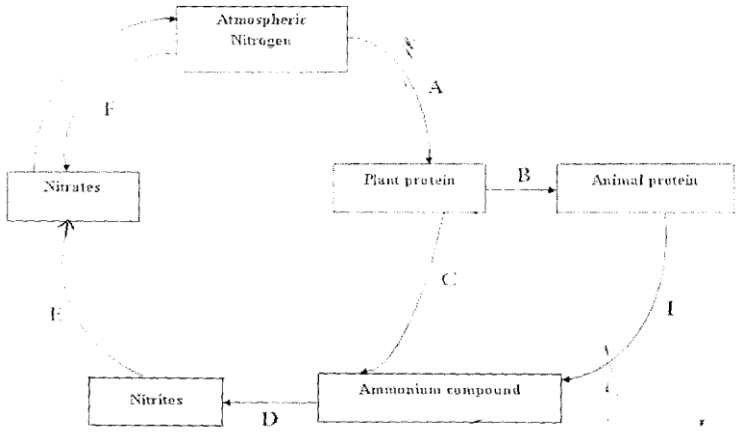
(c) Give two adaptations of the capillary wall. (2mks)

10. State the importance of the following parts of a microscope (2mks)

(i) Clip…….

(ii) Coarse adjustment knob……...

11. The diagram below represents a simplified Nitrogen cycle



(i) Name the organisms that cause the following process (3mks)

A…….

D…….

E…….

(ii) Name the process presented in I above (1mk)

12. An experiment was done by form four students in a certain school on tile reaction of growing seedling which was placed horizontally in position on a moist cotton wool, After sonic days it was observed that the shoots bends upwards while the roots bend downwards.

(a) Name the response exhibited by the roots. (1mk)

……

……

(b) Explain how both bending of the shoots and roots occur (2mks)

……

……

……

……

13. The equation below represents a certain process that occurs in plants.

$C_6H_{12}O_6$ + substance x $\xrightarrow[v]{\text{process}}$ lactose + product k

Name the substance x…… (1 mk)

Product k…….. (lmk)

Process v (1mk)

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

(i) Homeostasis. lmk)

(ii) Osmoregulation. (1mk)

(b) hormones involved in regulating glucose level iii blood. (2muks)

15. Give an example of a sex — linked trait in humans on

Y- Chromosome (lmk)

……

……

X-Chromosome. (1mk)

……

……

16. State two advantages of sexual reproduction.

(2mks)

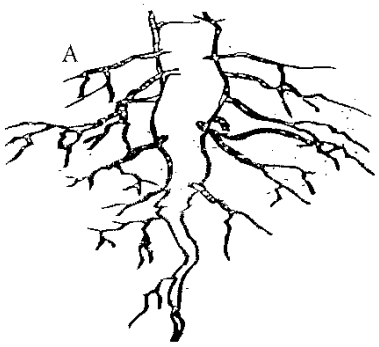
……

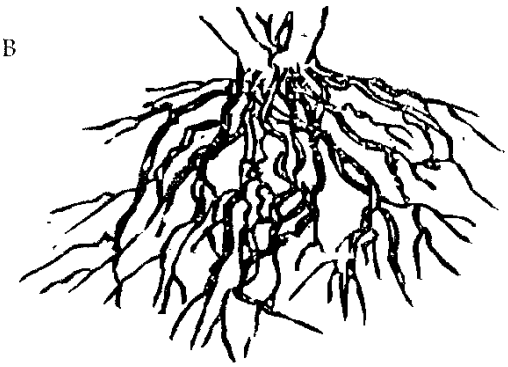
……

……

……

17. The diagrams below illustrate the organs of some flowering plants.



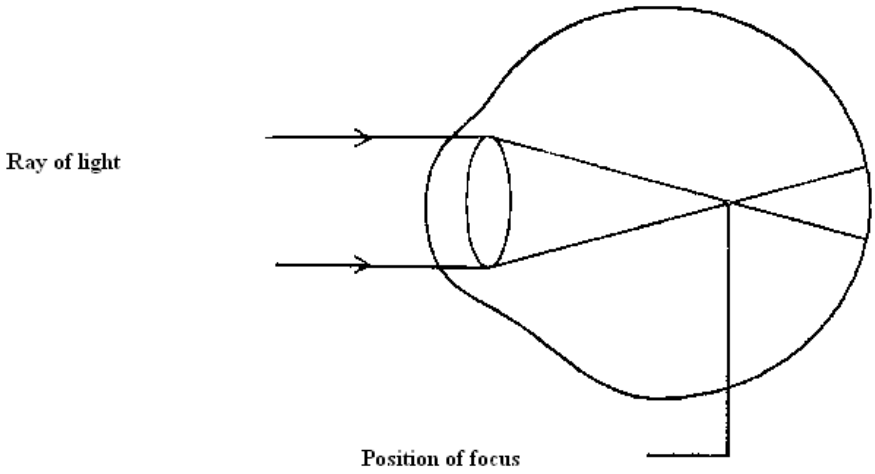


State the classes of plants to which each belong. (2mks)

A……..

B……

18. The diagram below illustrates a defect in the eye.



Explain how the defect illustrated above can be corrected.

(2mks)

……

……

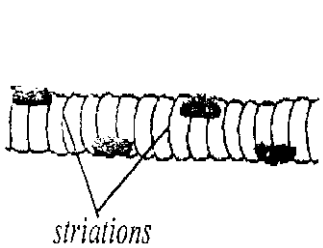
……

……

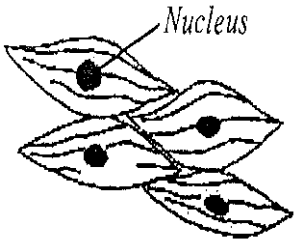
……

……

19. Below arc diagrams of muscles found in mammals. Study them carefully and answer the questions that follow.



Muscle Q



Muscle R

(a) Name the muscles.

Q…….

R……..

20. The following equation represents aerobic respiration.

$C_6H_{12}O_6 \longrightarrow 6CO_2 + 6H_2O$+ Energy 2 GCO + 611,0 + Energy

(a) Work out the respiratory quotient. (2mks)

(b) Stale the importance of respiration quotients

(1mk)

……

……

21. In humans name the hormone that:

(a) Stimulate the contraction of uterus during birth. (1mk)

……

……

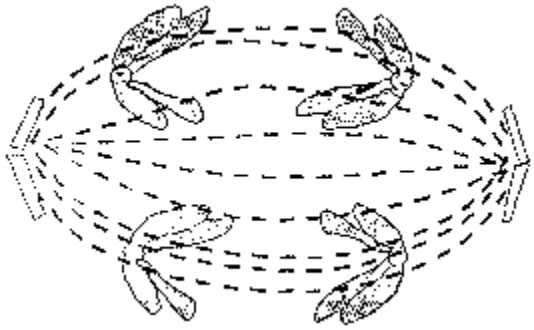
(b) Stimulate development of Graafian follicle

(1mk)

……

……

22. The diagram below represents a stage during cell division.



(a) Name the stage of cell division. (1mk)

……

……

(b) Give two reasons for your answer in (a) above. (1mk)

……

……

23. (a) Name the respiratory surface for gaseous exchange in insects. (1mk)

……

……

(b) State two adaptations of the site named in (a) above. (2mks)

……

……

24. In an experiment, the concentration of ions in the cell sap of reeds growing in a swampy area and the water in the swamp were determined. The data below was obtained, Study it and answer the questions that follow.

(a) Name the process by which uptake of the following ions by the reeds occurs. (2mks)

……

……

……

……

25. State TWO adaptations of a leaf to gaseous exchange. (2mks)

……

……

……

……

26. (a) The action of pepsin stops in the. duodenum. Explain. (2mks)

……

……

……

……

(b) State one functions of the muscles found iii the alimentary canal of mammals. (1mk)

……

……

27. Name the substance produced during anaerobic respiration in animals and state why it should be got rid of immediately (2mks)

Substance……

Reason……...

28. (a) Wing am i insect, wing of a bird, hand of a man, flipper of a whale, foreleg of a horse are Locomotory structures in animals. Using the structures listed above state the ones considered as

(i) Homologous structures

(1mk)

……

……

(ii) Analogons structures

(1mk)

……

……

(b) Identity the type of evolution that brings about

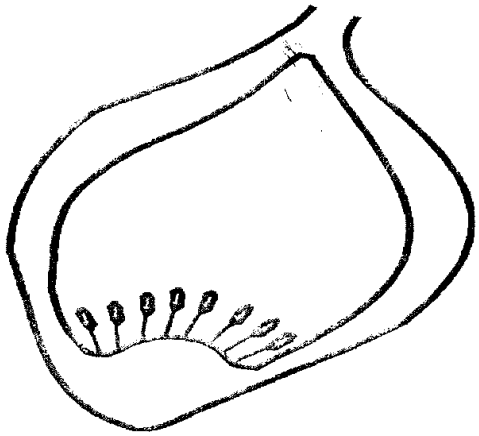
(i) Homologous structures

(1mk)

……

……

29. (a) Identify the type of placentation shown by the diagram below. (1mk)



(b) Give two adaptation of a fruit dispersed by water.

(2mks)

……

……

……

……

……

……

231/2
BIOLOGY
PAPER 2
(THEORY)
JULY/AUGUST-2016
TIME: 2 HOURS.

SAMETA SUB-COUNTY JOINT EVALUATION TEST- 2016
Kenya Certificate of Secondary Education. K.C.S.E)

231/2
BIOLOGY
PAPER 2
(THEORY)
JULY/AUGUST-2016
TIME: 2 HOURS.

INSTRUCTIONS TO CANDIDATE'S

(a) Write your **name** and **index number** in the spaces provided above.
(b) **Sign** and **write the date of examination** in the spaces provided above.
(c) This paper consist of **2** sections; **A and B.**
(d) Answer all the questions in section A in the spaces provided.
(e) In section **B a**nswer question 6 (**compulsory**) and either question **7** or **8** in the spaces provided after question 8.
(f) This paper consists of **12 p**rinted pages.
(g) Candidate's should check to ascertain that all pages are printed as indicated and that no questions are missing.
(h) Candidates should answer the questions in English.

For Examiner's Use Only.

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

Total Score	**80**	

SECTION A (40marks)

Answer all questions in this section in the spaces provided.

1. (a) Define Osmosis. (2mks)

……

……

(b) Distinguish between haemolysis and plasymolysis. (2mks)

……

……

……

……

(c) How do the following factors affect the rate of diffusion.

(i) Diffusion gradient. (1mk)

……

……

(ii) Temperature. (1mk)

……

……

(d) Outline two roles of active transport in human body (2mks)

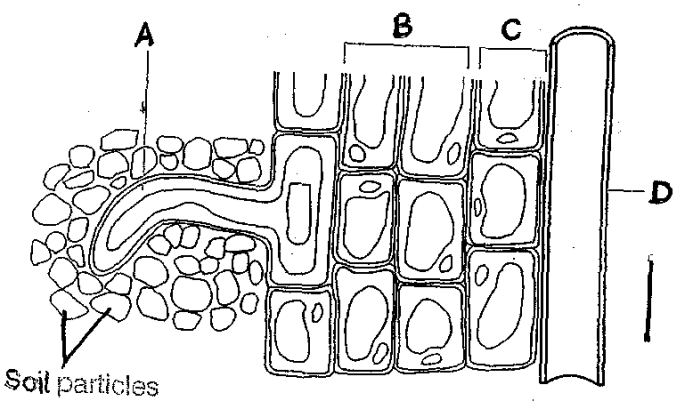
……

……

……

……

2. The diagram below shows part of a longitudinal section of a young root.



(a) Name the parts labelled A, B,C and D.

A……. (1mk)

B……. (1mk)

C……. (1mk)

D……. (1mk)

(b) State the importance of the cell labelled A. (1mk)

……

……

(c) How is the tissue labelled D adapted for the function it performs? (3mks)

……

……

……

3. When pure breeding black guinea pigs were crossed with pure breeding white guinea pigs, the offspring had a coat with black and white patches.

(a) Using latter G to represent the gene for black coat colour and letter H for white coat colour, work out the genotypic ratio of F2. (5mks)

(b) State the phenotypic ratio of F2. (1mk)

……

……

(c) (i) Name the term used when two alleles in heterozygous state are fully expressed phenotypically in an organism. (1mk)

……

……

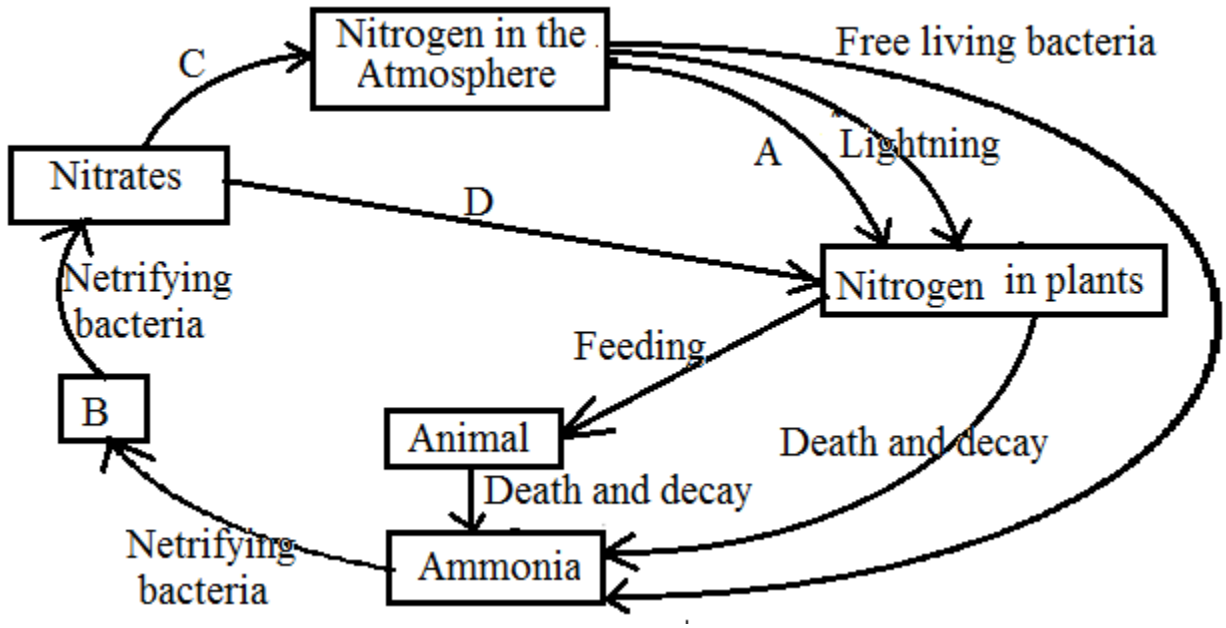
(ii) Give an example of a trait in human beings were the condition whose term is named in

(c)(i) above express itself. (1mk)

……

……

4. The diagram below represents the nitrogen cycle.



(a) State the process labelled A and D.

A…… (1mk)

D…… (1mk)

(b) Name the compound represented by B. (1mk)

……

……

(c) Name the group of organisms labelled C.

(1mk)

……

……

(d) (i) Name the group of plants which promote process A. (1mk)

……

……

(ii) State the part of the plant where process a takes place. (1mk)

……

……

(e) How would excess pesticides in the soil interfere with process A. (2mks)

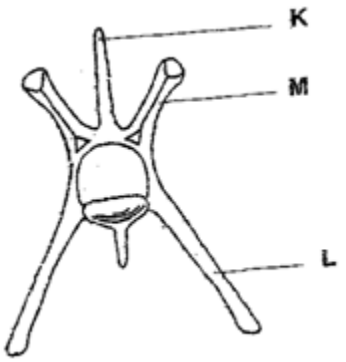
……

……

……

……

5. The diagram below illustrates above found in the human skeleton.



(a) Identify the bone. (1mk)

……

……

(b) Give two distinguishing features for your answer in

(a) above. (2mks)

……

……

……

……

(c) Name the parts labelled L, M and K.

L……. (1mk)

M……. (1mk)

K……. (1mk)

(d) Explain how part M adapts the above bone to its function. (1mk)

……

……

(e) State the view at which the bone was observed to come up with the diagram. (1mk)

……

……

SECTION B (40marks)

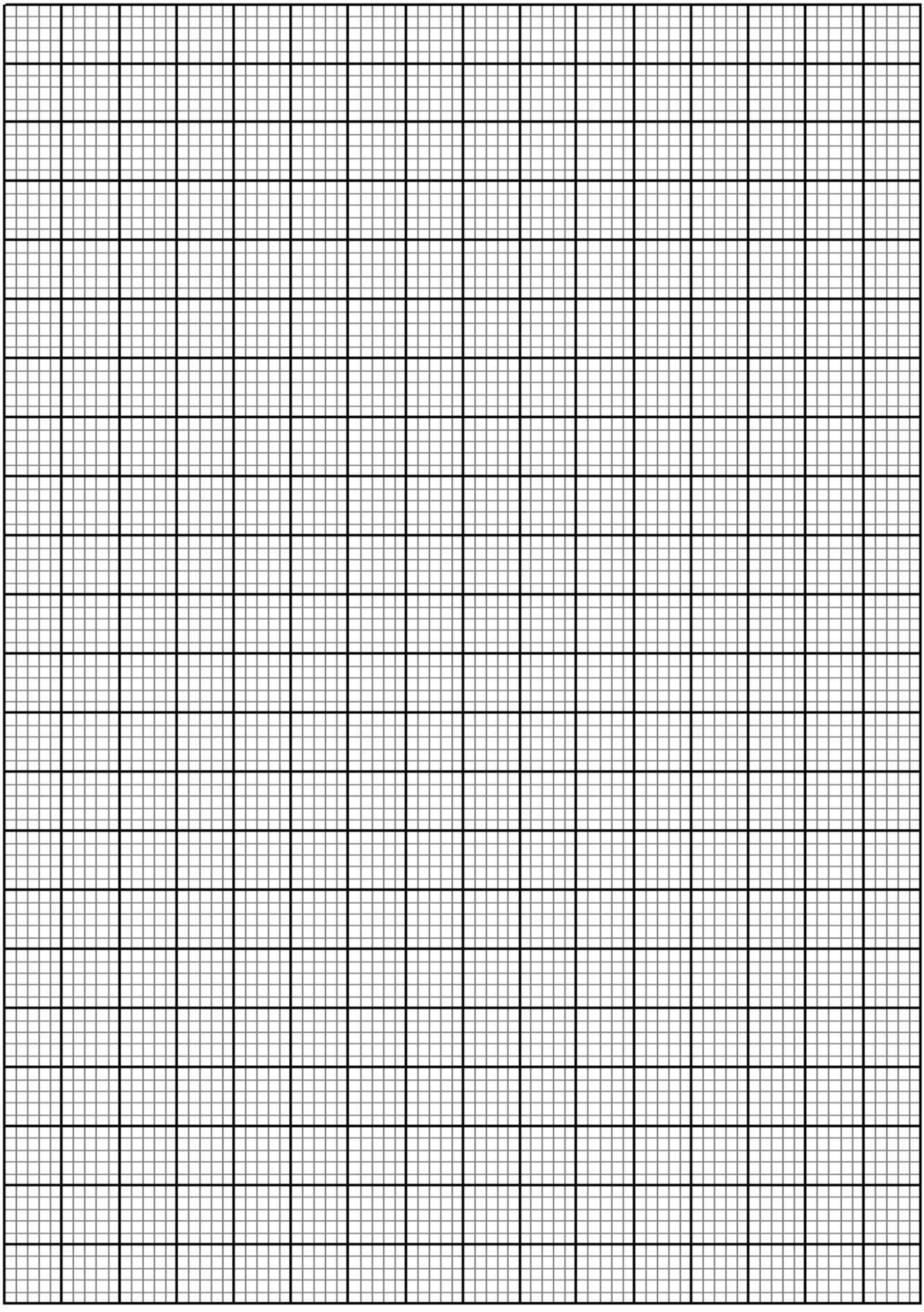
Answer question 6 (Compulsory) and either question 7 or 8 in the spaces provided after question 8.

16 A person had gone for 24 hours without food. Then he was served with a well balanced meal, after which the concentration of glucose and amino acids in the blood were determined every one hour for the next 8 hours after the meal. The concentration were measured as blood passed through the hepatic portal vein and hepatic vein. The results were as shown in the table below.

Time in hours	Concentration of glucose	and amino acids in	blood(mg/100cm^3 of blood)	
	HEPATIC PORTAL	VEIN	HEPATIC	VEIN
	GLUCOSE	AMINO ACIDS	GLUCOSE	AMINO ACIDS
0	79	1.0	85	1.0
1	79	1.0	85	1.0
2	160	1.0	110	1.0
3	140	4.0	100	3.0
4	120	6.0	90	2.0
5	100	5.0	90	2.0
6	90	1.0	90	1.0
7	90	1.0	90	1.0
8	90	1.0	90	1.0

(a) On the same axis plot graphs of glucose concentration in hepatic portal vein and hepatic vein against time. `

(7mks)



(b) Account for the difference in blood sugar level in hepatic portal vein and hepatic vein;

(i) between 0-1 hours. (4mks)

(ii) Between 2-4 hours (4mks)

(c) (i) Give one reason that delayed increase in amino acids concentration in hepatic portal vein. (1mk)

(ii) Account for the difference in concentration of amino acids hepatic portal vein and hepatic vein between $3^{rd} – 6^{th}$ hours. (2mks)

(d) Name the collective name for enzymes which act upon each of the following food.

(i) Proteins. (1mk)

(ii) carbohydrates. (1mk)

7. (a) Define Organic evolution. (2mks)

(b) Explain the various evidences of organic evolution. (18mks)

8. Describe the role of plants hormones in growth and development of plants. (20mks)

……

……

……

……

……

……

……

……

……

……

Paper 1

(Theory)

2hours

THE SUKEMO JOINT MOCK EXAMINATIONS

Kenya Certificate of Secondary Education

BIOLOGY

Paper 1

(Theory)

2 Hours

Instructions to candidates

(a) Write your **name** and **index number** in the spaces provided above

(b) Sign and write the date of examination in the spaces provided above

(c) Answer **ALL** questions in the spaces provided

(d) This paper consists of 9 printed pages

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

question	Maximum score	Candidate's score
1-28	80	

Kenya Certificate of Secondary Education

BIOLOGY

Paper 1

1. (a)The study of microorganisms (microbes) is called microbiology. Name any two branches of microbiology. (2mks)

……

……

……

(b) Name the branch of biology that deals with the study of the Phylogenetic relationship among organism (1mk)

……

……

2. (a) state **one** environmental problem that can be solved by studying biology (1mk)

……

……

(b) State **two** precautions taken during collection of specimens (2mks)

……

……

……

3. (i) the liger is an offspring of a lion and a tiger. Explain why the liger is infertile (1mk)

……

……

……

(ii) Name **two** members of kingdom Protoctista (2mks)

……

……

……

4. (a)(i) State the function of diaphragm in the microscope (1mk)

……

……

……

(ii) State the advantage of using light microscope over electron microscope (1mk)

……

……

(b) What is the role of cristae in respiration? (1mk)

……

……

……

5. Explain the process of wilting (2mks)

……

……

……

……

6. (a) Use the equation below to answer questions that follow (3mks)

Maltose + A $\xrightarrow{\text{process B}}$ glucose + C

Identify:

A……

……..

B……

……..

C……

……..

(b) Explain why patients who cannot feed orally are given glucose in a drip (2mks)

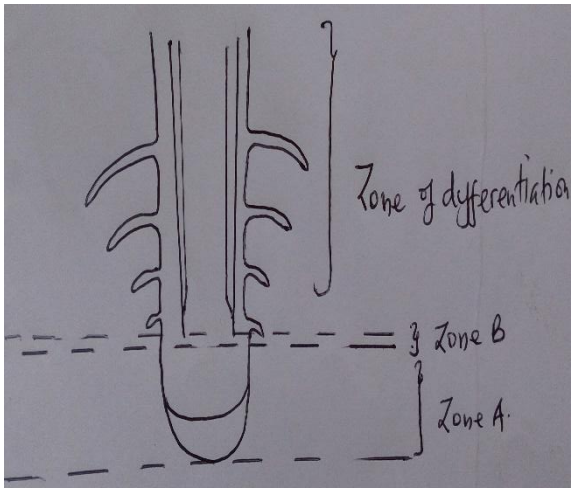
……

……

……

……

7. (a) The diagram below represents the apical growth in a root



(i) What happens to the cells at zone B (2mks)

……
……

(ii) Name the hormone produced at zone A that brings about a change in zone B (1mk)

……
……

(b) State **two** adaptations of phloem tissue to its functions (2mks)

……
……
……
……

8. (a) Distinguish between natural (innate) and natural acquired immunity (2mks)

……
……
……

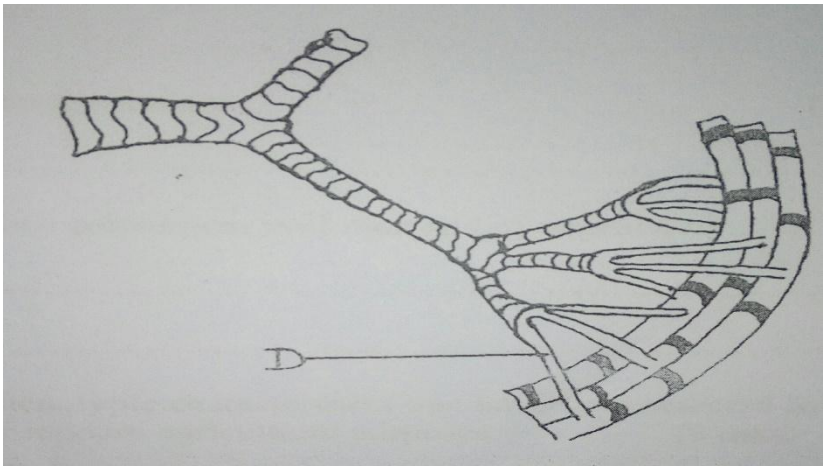
(b) (i) State why it is a disadvantage to have blood group O (1mk)

……
……
……

(ii) Describe the basic steps in blood clotting in human beings (4mks)

……
……
……
……
……
……
……

9. The diagram below is a structure used in gaseous exchange in insects



(a) Identify part labelled D (1mk)

……

……

(b) State**one** adaptation of structure D to its function (1mk)

……

……

(c) A person who has been smoking for many years was found to have a lot of dust and microorganism in the lungs. Explain (2mks)

……

……

……

10. (a) Give an equation to show that respiration involves oxidation of a food stuff (1mk)

……

…….....

……

…….....

(b) How is an energy rich molecule rebuilt after muscle contraction (2mks)

……

……

……

…….....

……

…….....

……

…….....

(c)Name the end products of Kreb's cycle (2mks)

……

……

11. (a) Name the excretory product removed through guttation (1mk)

……

……

(b) Name the structures in the skin that deals with (2mks)

(i) Temperature regulation

……

……

(ii) Excretion

……

……

(c) Seals have very thick layer of fatty tissue under the skin. In what way is this useful to them? (2mks)

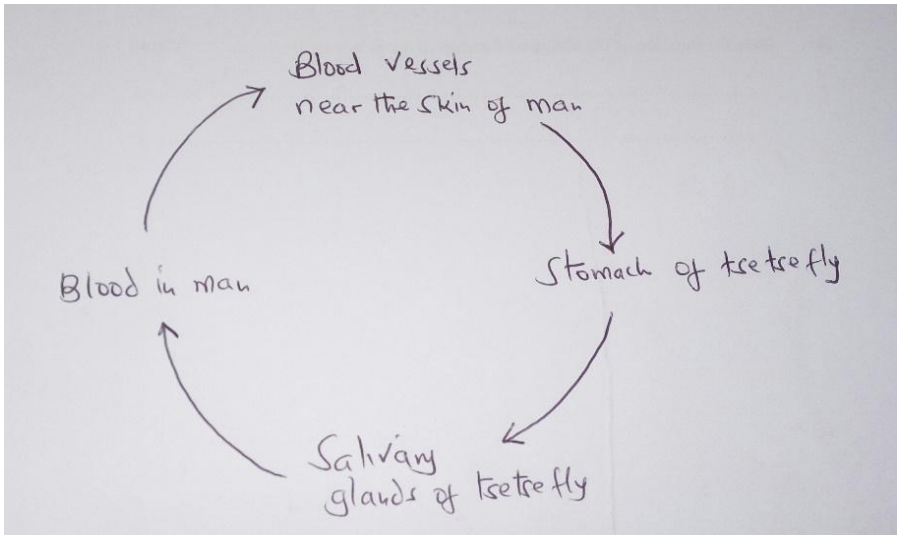
……

……

……

……

12. Below is the life cycle of a pathogen which causes sleeping sickness



(a) (i) Suggest a method which can be used to eradicate/remove the pathogen from people

……

……(1mk)

(ii) State the phylum to which the pathogen belongs (1mk)

Phylum

……

……..

(b)State **two** reasons why green plants are included in a fish aquarium (2mks)

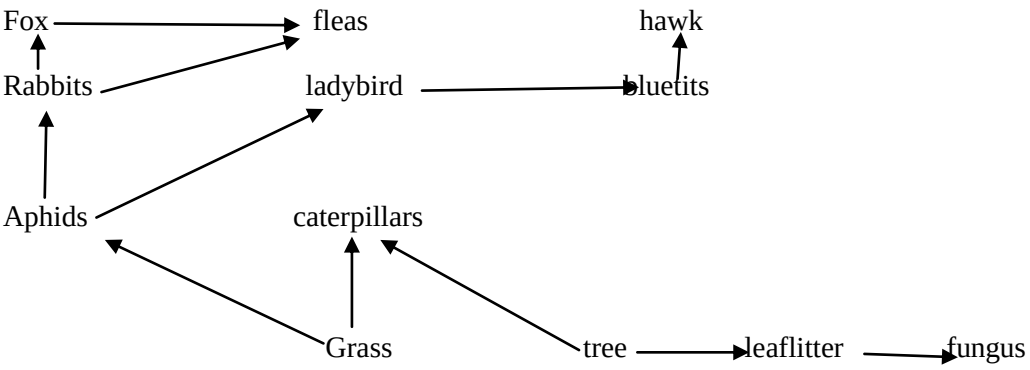
……

……

……

……

(c) Study the diagram below



(i) Name the primary producer (1mk)

……

……

(ii) State reasons why not all energy stored in the rabbit's body is transferred to the fox (1mk)

……

……

……

13. Give the functions of the following ecological instruments (2mks)

(a) Seechi disc

……

……

(b) Photographic light meter

……

……

14. (a) Explain why fertilization must take place in the fallopian tube but not uterus (2mks)

……

……

……

……

(b) Explain double fertilization in flowering plants (3mks)

……

……

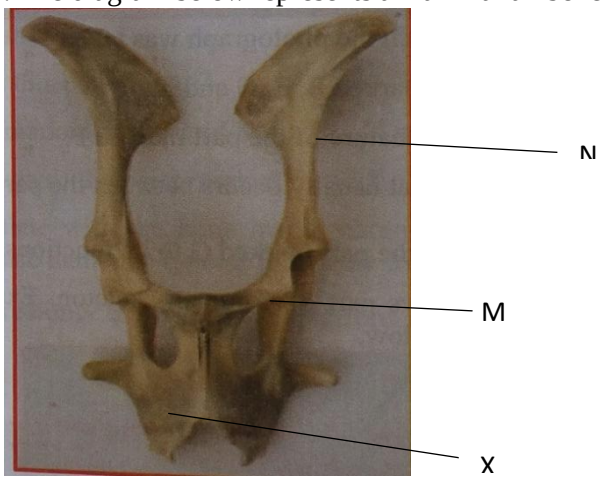
……

……

……

……

15. The diagram below represents a mammalian bone of the appendicular skeleton



(a) Name and state the functions of the part labelled M and N (2mks)

…M……

……

……N……

……

……

……

(b) State how the structure X is adapted to its function (1mk)

……

……

……

16. State the **three** main features of cervical vertebra (3mks)

……

……

……

……

17. Distinguish between skeletal and cardiac muscles (2mks)

……

……

……

18. List down **three** phenotypic characteristics that have been selected for the production of strains suitable for modern agricultural purposes (3mks)

……

……

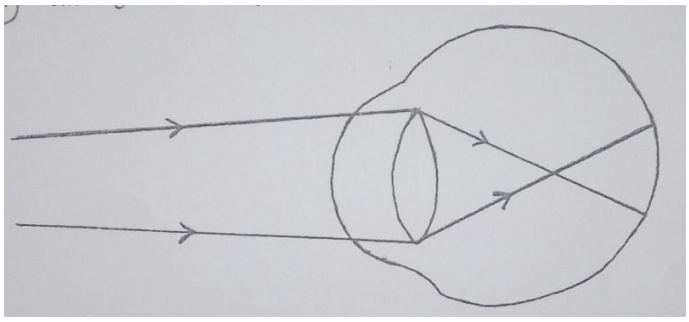
……

……

19.The following experiments were carried out by students.

(a) The student was told to hold a mirror close to the eyes and cover them with hands for about 15 seconds and then remove their hands and open the eyes. State how the size of the two pupils were altered. (2mks)

(b) The diagram shows the position of an image formed in a defective eye



(i) Draw a diagram to show how the defect can be corrected (2mks)

20. Give **two** importance of nastic responses (2mks)

……

……

……

21. (a) What does Lamarck's idea of evolution emphasize? (1mk)

……

……

……

(b) What evidence is there to suggest that vertebrates have a common ancestral origin?(1mk)

……

……

……

22. (a) Name the hormone that sustains the larval stage in insects and the structure that produce it.

(2mks)

Hormone……

……

Structure……

……

(b) State the type of growth which occurs in insects (1mk)

……

……

This is the last printed page

231/2
BIOLOGY PAPER 2
THEORY
JULY/AUGUST 2016
TIME: 2 HOURS

SUKEMO JOINT EXAMINATION TEST - 2016
Kenya Certificate of Secondary Education (K.C.S.E.)
231/2
BIOLOGY PAPER 2

INSTRUCTIONS TO CANDIDATES

- Write your name and index number in the spaces provided above.
- Sign and write the date of examination in the spaces provided.
- In Section B answer questions 6 (Compulsory) and either question 7 or 8 in the spaces provided after question 8.
- Answer all the questions in the spaces provided.
- Candidates should answer all the questions in English.

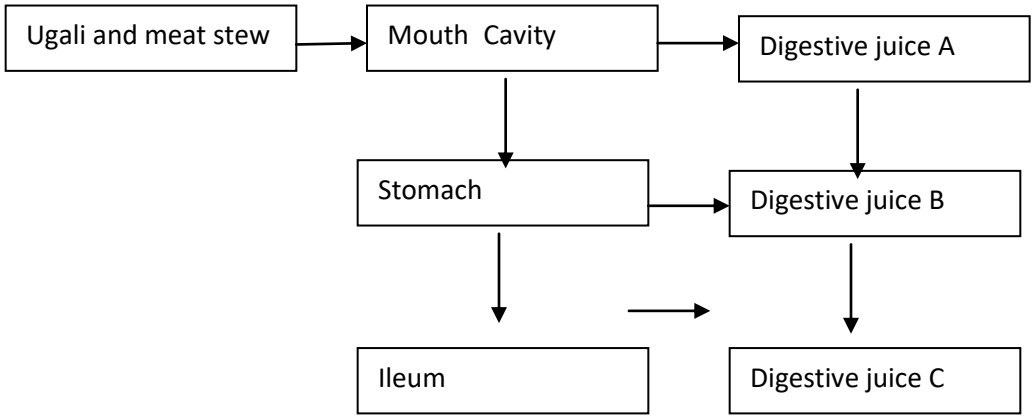
For Examiners' use ONLY

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
A	**1**	**8**	
	2	**8**	
	3	**8**	
	4	**8**	
	5	**8**	
	6	**20**	
	7	**20**	
	8	**20**	
TOTAL		**80**	

SECTION A (40 Marks)

INSTRUCTIONS* – *Answer ALL the questions in this section in the spaces provided.

1. The flow diagram below represents passage of a meal through the human digestive system. Study the diagram and answer the questions that follow:-



a) Name the physical process that will occur in mouth cavity. (1 mark)

……

b) Name the digestive juices B and C. (2 marks)

B_____

C_____

c) Explain two ways in which the digestive system is protected from corrosive effects of digestive juices. (2 marks)

……

……

……

……..

……

……

d) Name the hormone that stimulates secretion of juice B. (1 mark)

……

……

e) Identify two contents of digestive juice A. (2 marks)

……

……

……

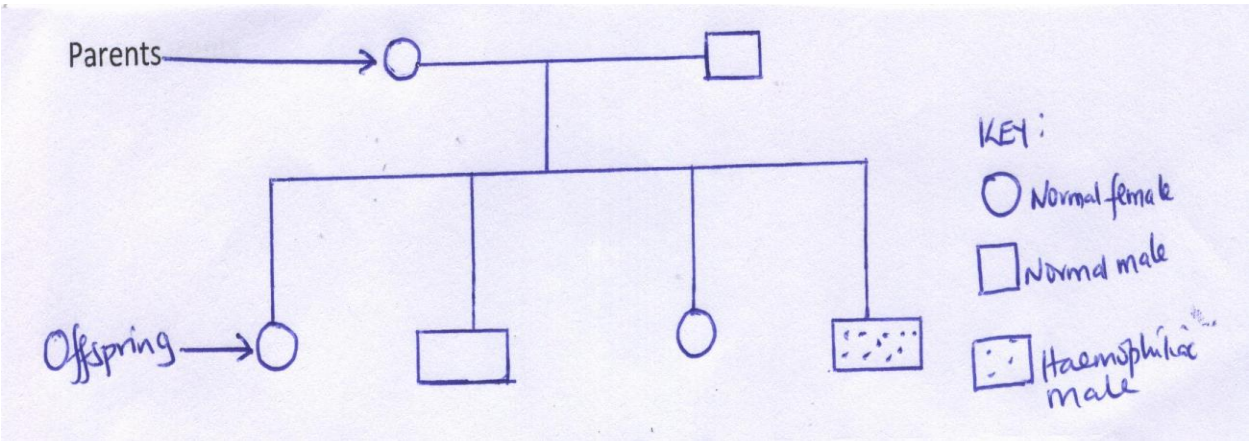
……

2.a) Each human somatic (body) cell has 46 chromosomes in its nucleus. How many of these are sex chromosomes? (1 mark)

……

…… b)

Haemophilia is due to a recessive gene. The gene is sex-linked and located on the x-chromosome. The figure below shows some offspring from phenotypically normal parents.



i) What are the parental genotypes?

Father_____Mother_____ (2 marks)

ii) Work out the genotypes of the offspring. (2 marks)

c) State <u>two</u> other disorders in humans that result from gene mutation. (2 marks)

……

……

……

……..

3.a.i) Name the cartilage found between the bones of the vertebral column. (1 mark)

……

……

ii) What are the functions of the cartilage named in a.(i) above? (3 marks)

……

……

……

……

……

……

b) State <u>two</u> ways by which plants compensate for lack of ability to move from one place to another. (2 marks)

……

……

……

……

c) State adaptations of the following tissue in plants. (2 marks)

i) Collenchyma tissues.

……

……

……

……

ii) Sclerenchyma tissues.

……

……

……

……

4. The table below shows the contents of urine compared to blood plasma and glomerular filtrate in a mammal. Study it and answer the questions that follow:-

Component	**Plasma g/cm^3**	**Glomerular g/100 cm^3**	**Urine g/100 cm^3**
Urea	0.04	0.04	2.10
Uric acid	0.005	0.005	0.07
Glucose	0.20	0.20	0.00
Amino acids	0.07	0.07	0.00
Plasma proteins	9.00	0.00	0.00
Salts	0.84	0.84	1.96

a) Account for the absence of:-

i) Plasma protein in glomerular filtrate. (1 mark)

……

……

……

ii) Glucose and amino acids in urine. (1 mark)

……

……

……

b) From the results above, identify two types of wastes eliminated from the mammalian blood through the kidney. (2 marks)

……

……

……

……

c) Give a reason why kidney tubules are highly coiled. (1 mark)

……

……

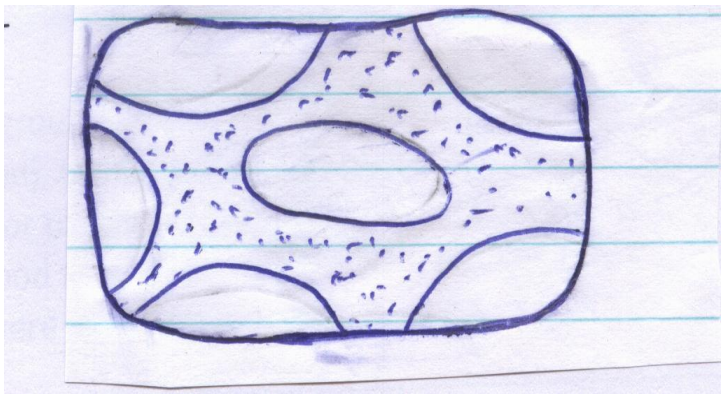
d) Name the hormone responsible for:-

i) Reabsorption of water. _____ (1 mark)

ii) Reabsorption of sodium chloride. _____ (1 mark)

e) Name one kidney disease._____ (1 mark)

5. A student placed a plant cell in solution X for 30 minutes. The cell appeared as shown in the diagram below:-



a) What is the nature of solution X? (1 mark)

……

……

b) State the process that makes the cell appear as shown in the diagram. (1 mark)

……

……

c) Account for the shape of the cell after 30 minutes. (3 marks)

……

……

……

……

……

……

……

d) Explain what would happen if a red blood cell is placed in distilled water. (3 marks)

……
……
……
……
……
……
……

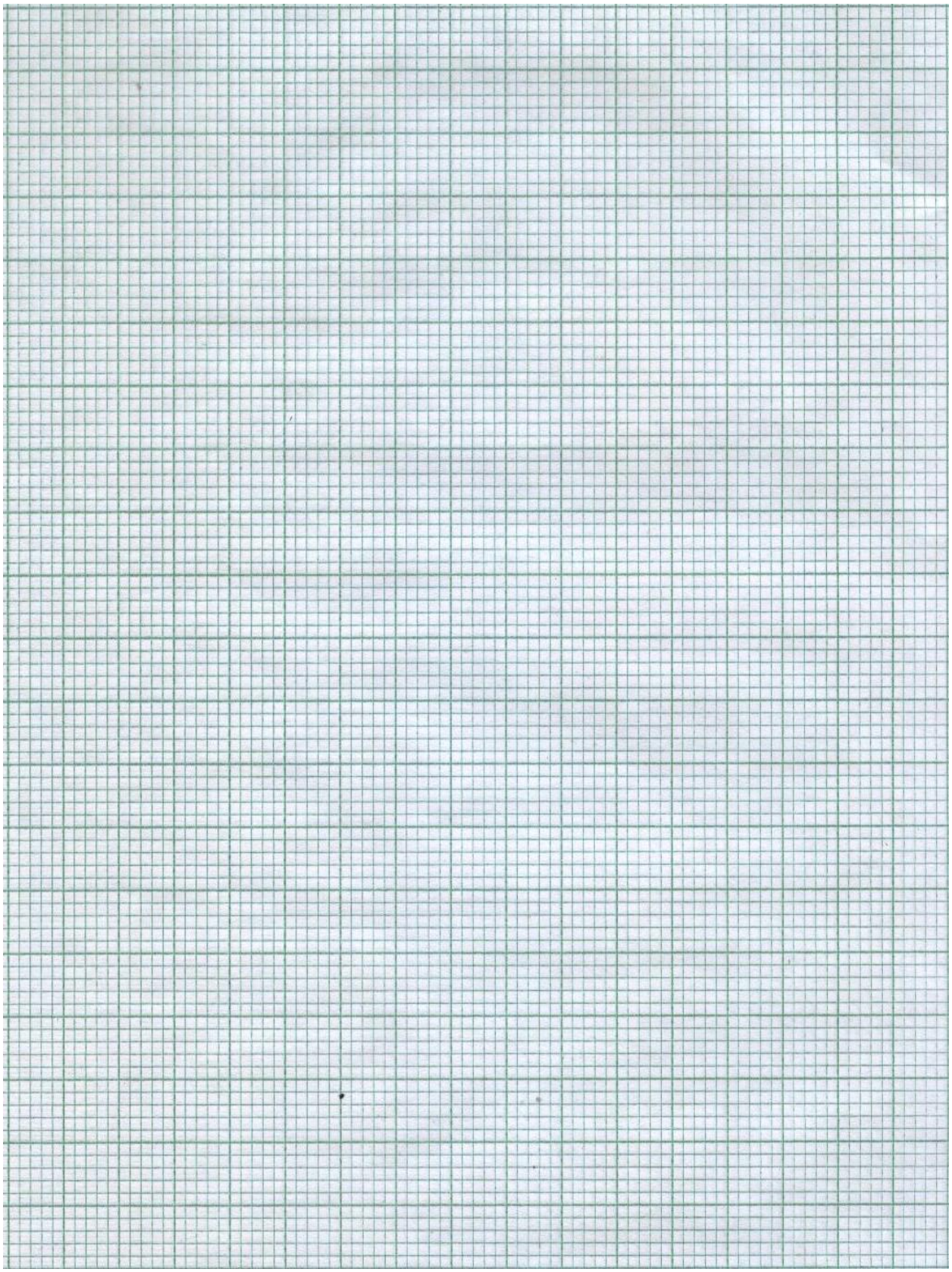
SECTION B (40 Marks)

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

6. In a study on immunity, two groups of mice were immunized with sheep blood (0.1 m l or 20% cell suspension). One of the groups was given 5 dozes of a drug Tinocordine (50 mg each) prior to immunization. The second group was not treated with Tinocordine. Blood was collected from each group every third day for one month. The results were as shown in the table below:-

NO. OF DAYS AFTER IMMUNIZATION	**ANTIBODIES(ARBITRARY UNITS**	
	TINOCORDINE TREATED MICE	**NON-TINOCORDINE TREATED MICE**
3	15	5
6	20	5
9	30	15
12	60	25
15	122	30
18	250	30
21	122	30
24	60	30
27	37	22
30	27	5

a) Plot graphs using the same axes to display the results above. (8 marks)



b) What is the effect of Tinocordine on the immune system? (1 mark)

……

c) Determine the rate of antibody production between day 13 and 17 in:-

i) Tinocordine treated Mice. (2 marks)

……

……

……

……

ii) Non-Tinocordine treated mice. (2 marks)

……

……

……

……d.i)

What type of immunity is described in the information above? (1 mark)

……

……ii) Name another type of immunity. (1 mark)

……

…….....e) Name the causative agent of AIDs in humans and state its effect on the body. (2 marks)

Agent Effect:……

Effect:…….

f) Name <u>three</u> diseases in human beings here vaccination is done. (3 marks)

……

……

……

7.a) Describe the sequence of events from the time a mature pollen grain is deposited on the stigma until an endosperm is formed. (16 marks)

b) State the adaptations of fruits and seeds to dispersal by water. (4 marks)

8.a) During a voting exercise tension was high. One of the aspirants was furious and wanted to face a very aggressive opponent. Explain the physiological changes that occur in his body to prepare him for the fight. (14 marks)

b) Identify each of the following responses described below:-

i) A person coughs whenever a foreign body irritates the respiratory tract. (1 mark)
ii) Whenever a bell is rung, a dog is presented with a meal. After several days of practice, the dog salivates once the bell is rung even if food is not available.

(1 mark)

c) State the differences between the two responses identified in (b) above. (4 marks)

……

……

……

END