TOP STUDENT KCSE

BIOLOGY PREDICTIONS

(SERIES 1)

FOR MARKING SCHEMES

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QUESTIONS ARE FREE

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

TOP STUDENT KCSE PREDICTIONS

SERIES 1 TRIAL 1 BIOLOGY PAPER 1

Kenya Certificate of Secondary Exams

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

- *Write your name and Index Number in the spaces provided above.*
- *Sign and write date of examination in the spaces provided above.*
- *Answer **ALL** questions in the spaces provided.*
- *All workings **MUST** be clearly shown where necessary.*
-

FOR EXAMINERS USE ONLY.

Question	Maximum Score	Candidates Score
1 – 28	80	

1. Name the reagent used for testing presence of (3 **marks**)
   (a) Starch
   (b) Reducing sugars
   (c) Vitamin c
2. State the processes which occur in each of the following organelles (2 **marks**)
   (a) Chloroplast
   (b) Mitochondrion

(c) Ribosomes

3. A student observed a specimen through a light microscope. He used the objective lens marked X40.If he indicated the magnification of the image as x 400, what was the eye - piece magnification?
(Show your working). (3 **marks**)

4. State the function of the following in mammalian trachea. (3 **marks**)
(a) Rings of cartilage
(b) Mucus
(c) Cilia

5. **(a)** What do you understand by the term biological control? (1 **mark**)
(b) Explain why all the energy produced by producers does not flow to the tertiary consumers. (2**marks**)

6. Name any three forces that maintain the transpiration stream (3 **marks**)

7. Give the form in which the following gases are transported in blood. (3 **marks**)
(a) Oxygen
(b) Carbon (IV) oxide
(c) Carbon (II) oxide

8. **(a)** Name the main group of organisms which comprise the Kingdom Monera. (1**mark**)
(b) State any three ways in which the organisms named in 8 (a) above affect human lives. (3**marks)**

9. State the main characteristics of Monera which distinguish it from all other kingdoms.

10. State ways in which the xylem tissue is adapted to carry out its function.(3**marks**)

11. Why is it necessary for an athlete to breathe heavily after running? (2 **marks**)

12. State ways in which the following diseases can be prevented
(a) Typhoid and amoebic dysentery (2 **marks)**
(b) Malaria (2 **marks**)

13. What are the three distinguishing features of phylum Arthropoda? (3**marks**)

14. **(a)** Name the main product of the dark stage of photosynthesis. (1**mark**)
(b) What is the role of chlorophyll during photosynthesis (2**mark**)

15. Name three mechanisms that prevent self-pollination in flowers that have both male and female parts. (3 **marks**)

16. State three applications of anaerobic respiration. (3**marks**)

17. What is the significance of highly folded inner membrane of a (2**marks**)

18. Why is it necessary for blood from the gut to pass through the liver before joining general circulation? (2 **marks**)

19. A person's urine tested positive for reducing sugars.

(a) Name the type of sugar present in the urine. (1**mark**)

(b) Name the gland and the hormone which failed to control the above (2**marks**)

Gland

Hormone

(c) Which disease was the person suffering from? (1**mark**)

20. State two roles played by the process of reproduction. (2**marks**)

21. What is the habitat of the following plants? (3**marks**)

(i) Xerophytes

(ii) Hydrophytes

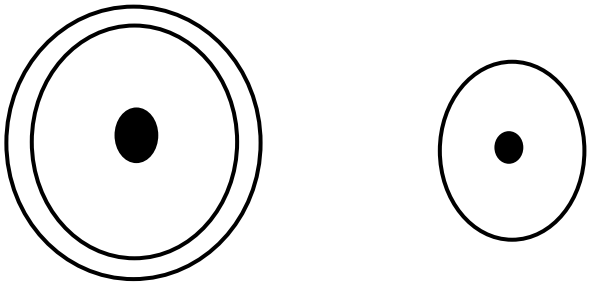
(iii) Halophytes

22. **(a)** State ways in which molars are adapted to their functions. (2**marks**)

(b) Name any ***two*** dental diseases. (2**marks**)

23. How is the sperm cell adapted to carry out its function? (3**marks**)

24. The following are diagrams of two pollen grains.



K **L**

(a) State one observable difference between K and L. (1**mark**)

(b) State the agent of pollination for each of them. (2**marks**)

K

L

25. How do sunken stomata reduce transpiration? (2**marks**)

26. Give the classes to which the following animals belong. (3**marks**)

(a) Human being

(b) House fly

(c) Spider

27. **(a)** State one event that occurs in prophase of meiosis I which does not occur in prophase of mitosis (1 **mark**)

(b) What are the results of the above phenomena? (2**marks**)

27. Explain why growing grass die a few days when salt is sprinkled on it. (3**marks**)

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

TOP STUDENT KCSE PREDICTIONS

SERIES 1 TRIAL 1 BIOLOGY PAPER 2

Kenya Certificate of Secondary Exams

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

- *Write your name and Index Number in the spaces provided above.*
- *This paper consists of **two** sections. Section **A** and section **B.***
- *Answer **ALL** questions in section **A** in the spaces provided. In section **B** answer question **6** (compulsory) and either question **7** or **8** in the spaces provided after question 8.*
- *This paper consists of 10 Printed pages. Candidates should check the question paper to ensure that all the papers are printed as indicated and no questions are missing*

For Examiners use only.

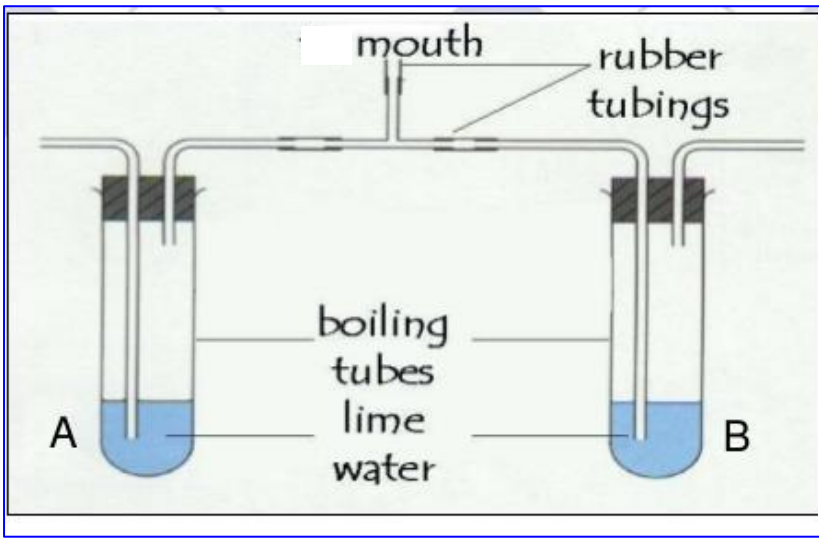
Section	Question	Maximum score	Candidates score
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
B	6	20	
	7	20	

	8	**20**	
	Total score	**80**	

SECTION A. 40 MARKS

Answer all the Questions in this section.

1. The diagram below illustrates an experimental set up to compare relative amounts of a gas in inhaled air and exhaled air.



a) On the diagram, show with arrows the direction of movement of inhaled and exhaled air into and out of the mouth. **(2mks).**

b) What is the name of the gas being investigated in the. **(1mk)**

c) What will happen to the lime water in **(2mks)**

Boiling tube **A?**

Boiling tube **B?**

d) Explain the observations made in (c) above **(3mks).**

2. A human gene which is Y-linked controls premature baldness. One allele leads to normal hair pattern while the other produces premature baldness

(a) What are alleles? **(1mark)**

b) If a man with premature baldness marries, work-out the phenotypes of his children. (Use letter R to represent gene for premature baldness). **(4 marks)**

c) Explain why this trait is not observed in females **(2marks)**

d) Give one other trait in man that is Y—linked **(1mark)**

3. a) What is active transport? **(1mark)**

(b) State three factors that increase the rate of active transport. **(3mks)**

(c) Give ***two*** roles of osmosis in plants **(2mk)**

(d) What would happen if a plant cell is placed in a hypotonic **(2mks)**

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

(a) Identify the fused bones **(1mk)**

(b) Name:

i) The bone that articulates at the point labelled **A** **(1mk)**

ii) The structure labelled **B** **(1mk)**

(c) State the type of joint formed at structure **B** **(1mk)**

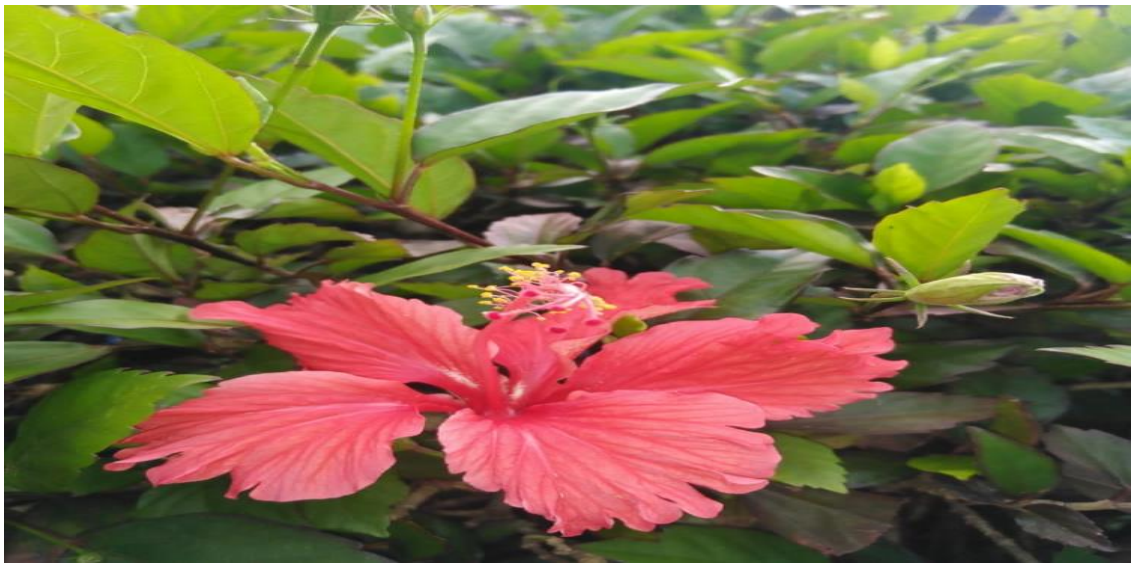
(i) Name: the structure labelled **(1mk)**

ii) State two functions of the structure named in d(i) **(2 mks)**

(d)i) Name the structure labelled **(1mk)**

ii) State what happens to the structure during childbirth **(1mk)**

5. Use the diagram below to answer the questions that follow;



(a) Name the class the plant belongs to **(1mk)**

(b) Give three **OBSERVABLE** characteristics that place the plant to the class named in **(a)** **(3mks)**

(c) If a cross section was done on the young stem, draw and label the section observed. **(3mks)**

SECTION B (40 MARKS)

Answer question 6 (compulsory) and either 7 or 8

6 .In an ecological study, a grasshopper population and that of crows was estimated in a certain grassland area over a period of one year. The results are as shown in the table below.

Months	*J*	*F*	*M*	*A*	*M*	*J*	*J*	*A*	*S*	*0*	*N*	*D*
Number of adult grasshoppers x 10_2	*90*	*20*	*11*	*25*	*2500*	*1652*	*120*	*15*	*10*	*35*	*192*	*456*
Number of crows	*4*	*2*	*0*	*1*	*8*	*22*	*7*	*2*	*1*	*1*	*5*	*15*

Amount of rainfall	*20*	*0*	*55*	*350*	*520*	*350*	*12*	*10*	*25*	*190*	*256*	*350*

(a) (i) What is the relationship between the rainfall and grasshopper population? **(1mark)**

(ii) Account for the relationship stated in a *(*i) **(3marks)**

(b) Explain the relationship between the grasshopper population and that of the crows **(3marks)**

(c) If the data was used in the construction of pyramid of numbers, what would be the trophic of; **(3marks)**

(i) Grasshoppers

(ii) Crows

(iii) The grass in the study area

(d) If the area studied was one square kilometer, state:

(i) one method that could have been used to estimate the crow population. **(1 mark)**

(**ii)** One method that could have been used to estimate the grasshopper **(1mark)**

(e) Suggest what would happen f a predator for grasshoppers entered the study area. **(2 marks)**

(f) What is meant by the term carrying capacity **(1mark)**

(g) Why would the carrying capacity of wild animals in a woodland grassland be higher than that of cattle? **(2marks)**

(h) What is an ecosystem? **(3marks)**

7. Describe how water from the soil reaches the leaves of a tall tree and eventually to the atmosphere **(20mks)**

8. Explain how the human alimentary canal is adapted to perform its functions. **(20mks).**

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

TOP STUDENT KCSE PREDICTIONS

SERIES 1 TRIAL 2 BIOLOGY PAPER 1

Kenya Certificate of Secondary Exams

TIME: 2 HOURS

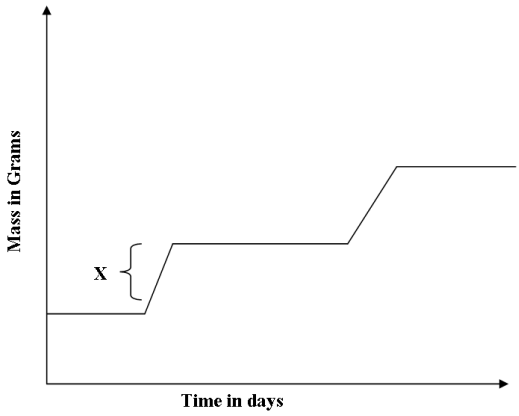
INSTRUCTIONS TO CANDIDATES

- Write your name and Index Number in the spaces provided above.
- Sign and write date of examination in the spaces provided above.
- Answer **ALL** questions in the spaces provided.
- All workings **MUST** be clearly shown where necessary.

For Examiners use only.

Question	Maximum Score	Candidates Score
1 – 25	**80**	

1.The graph below represents the growth pattern of animals in a certain phylum.



a)Name the type of growth curve shown above. **(1mk)**

b)i)Identify the process represented by **X**. **(1mk)**

ii)Name the hormone responsible for the process in b(i) above. **(1mk)**

c)State the importance of the growth of a pollen tube to a plant. **(1mk)**

2.a) What is the function of Sodium hydrogen Carbonate that is added to test solution of non-reducing sugar. **(1mk)**

b)The equation below represents a process X which is controlled by enzymes .

$$C_6H_{12}O_6 + C_6H_{12}O_6 \underset{\mathbf{R}}{\overset{\mathbf{X}}{\rightleftharpoons}} C_{12}H_{22}O_{11} + H_2O$$

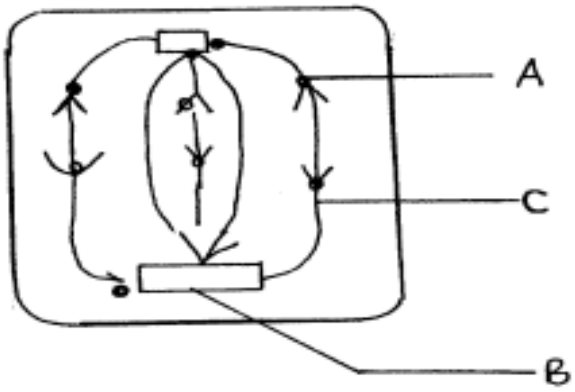
Glucose + Fructose Sucrose + Water

i) Name the process **X** and enzyme **R**

Process **X** **(1mk)**

Enzyme **R** **(1mk)**

3. The diagram shows an epidermal cell undergoing mitotic cell division.



i) Name the stage of mitosis it **(1mk)**

ii) Name the structures

A **(1mk)**

C **(1mk)**

4. What is the effect of gibberellins on the shoots of plants? **(4mks)**

5. (a) Give ***two*** forms in which carbon (IV) oxide is transported in human blood. **(2mks)**

(b) Name the enzyme that enhances the loading and off – loading of carbon (IV) oxide in the human blood. **(1mk)**

6. **a)**What is the importance of the counter current flow in the exchange of gases in a fish. **(2mks)**

b)State ***two*** ways in which the tracheoles of an insect are adapted to their functions. **(2mks)**

7.The equation below represents a reaction that occurs during respiration in a cell.

K + Phosphate ⟶ Adnenosine triphosphate

a)Identify the compound K. **(1mk)**

b)State ***two*** differences between **K** and **ATP.** **(2mks)**

c)Name the organelle responsible for the production of energy in a cell muscle **(1mk)**

8.Explain how crops grown along roads can be a source of lead poisoning to human beings. **(2mks)**

9.Explain why plants growing in low altitude areas grow faster than those in high altitudes. **(3mks)**

10. List down ***four*** phenotypic characteristics that have been selected for the production of strains suitable for modern agricultural purposes. **(4mks)**

11.Name the type of eye defects that can be corrected by;

i) Use of bifocal lens **(1mk)**

ii) Use of artificial lens **(1mk)**

iii) Use of concave lens **(1mk)**

12.a) The length from the tail tip to the anus of a certain tilapia fish is 10cm. The length from the tail tip to the mouth is 35cm. Calculate the tail power of the fish. (Show all your working **(2mks)**

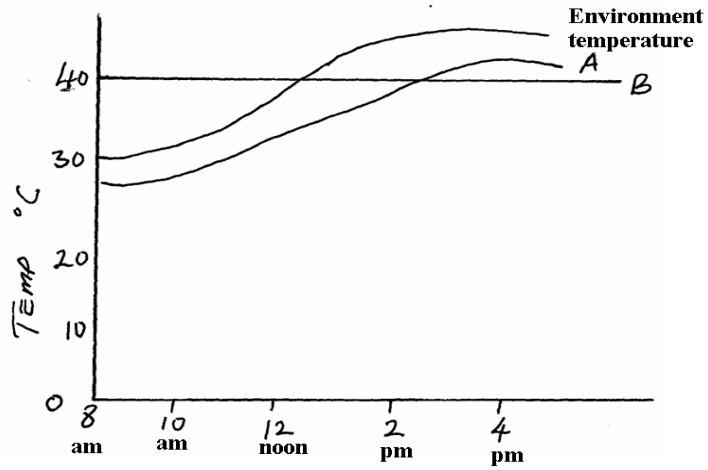
b)What is the significance of high tail power in fish? **(1mk)**

13. List down three differences between the endocrine system and nervous system. **(3mks)**

Endocrine system	Nervous system

14.Distinguish between the struggle for existence and survival for the fittest as used in the theory of natural selection. **(2mks)**

15. The body temperatures of two animals A and B varied as below with environmental Temperature



a)Which of the animals is;

i) Endothermic. **(1mk)**

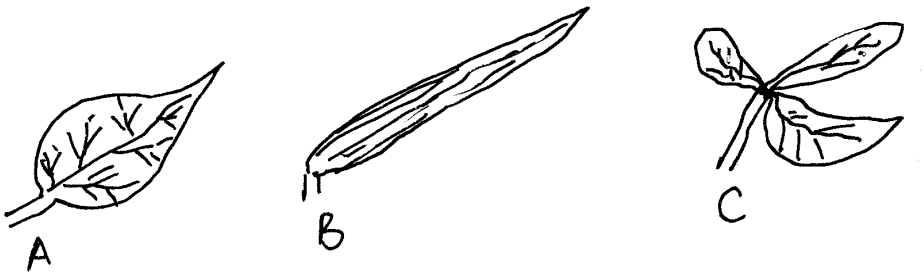
ii) Ectothermic **(1mk)**

b)With a reason, state which of the animals is likely to be widely **(2mks)**

16.State three roles of oestrogen during the menstrual cycle **(3mks)**

17. State three characteristics of cells at the zone of cell division in an apical merintem **(3mks)**

18. Below are diagrams of three leaves A, B and C. Construct a two step dichotomous key which can be used to identify each of them. **(4mks)**



19.a) Name two mutagenic agents. **(2mks)**

b) Identify the type of gene mutations represented by the following pairs of words.

i)Shirt instead of skirt **(1mk)**

ii) Hopping instead of shopping **(1mk)**

20. Liver damage leads to impaired digestion of fats. Explain this statement. **(2mks)**

21.Explain why several lateral buds sprout when a terminal bud in a young tree is removed. **(3mks)**

22.(a) State ***two*** structural adaptations that make xylem vessels suitable for transport of water and mineral salts. **(2mks)**

(**b)**List any ***three*** adaptations of the root hair cells to their functions **(3mks)**

23.(a) Define the following terms:- **(2mks)**

(i) Species:

(ii) Binomial nomenclature:-

24. What is the significance of active transport in the human body. **(3mks)**

25. Explain how the biceps and triceps muscles bring about the movement at the hinge joint of the elbow in man. **(2mks)**

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

TOP STUDENT KCSE PREDICTIONS

SERIES 1 TRIAL 2 BIOLOGY PAPER 2

Kenya Certificate of Secondary Exams

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

- This paper consists of two sections **A** and **B**.
- Answer **ALL** questions in section **A**
- Answer question **6** (compulsory) and either question **7** or **8** in section **B**.

For Examiner's Use Only

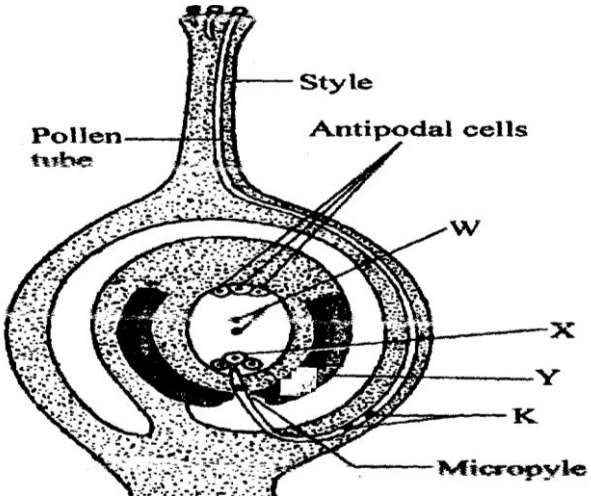
Section	*Question*	*Maximum score*	*Candidate's score*
A	*1* *2* *3* *4* *5*	*8* *8* *8* *8* *8*	
B	*6* *7* *8*	*20* *20* *20*	

Total Marks	***80***	

SECTION A (40 MARKS)

***Answer all questions in this section*.**

1.The diagram below shows a cross section through the female part of a flower.



a)Name the structures labeled **W**,**X**, and **Y**. **(3mks)**

W-

X-

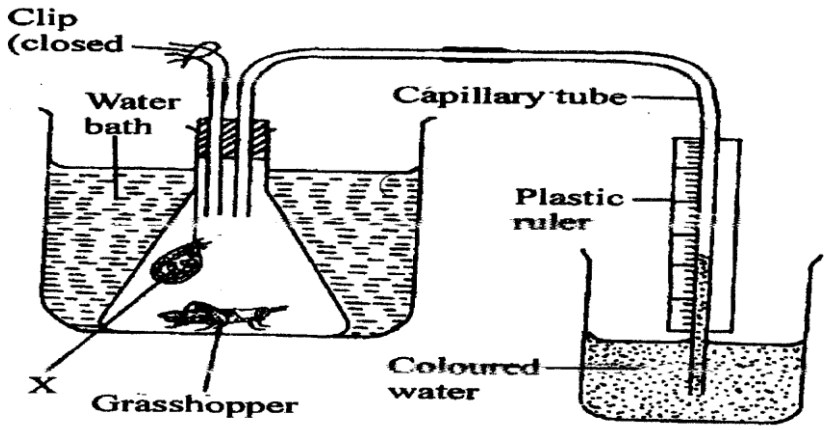
Y-

b)State ***two*** functions of the pollen tube. **(2mks)**

c)What happens to antipodal cells after fertilization. **(1mk).**

d)Name the structure labeled **K** and state their role. **(2mks)**

2. The diagram below illustrates and experiment to determine the rate of respiration in a small insect.



a)Name the chemical compound labeled **X** and state its function. (**2mks)**

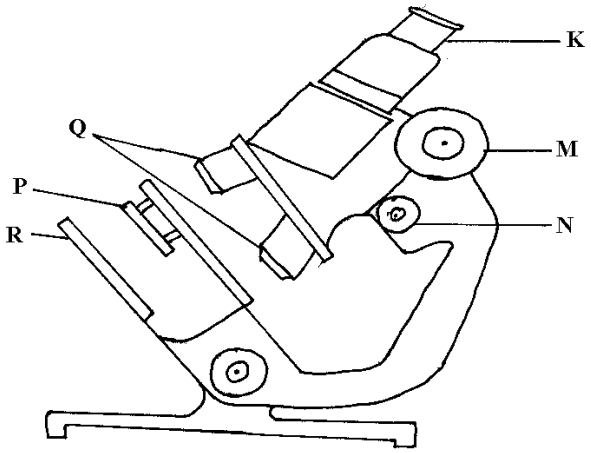
b)Why is it necessary to place the flask in a water bath. **(3mks)**

c)What changes would you expect to observe in the level of coloured water in the capillary tube after the experiment has run for five minutes. **(1mk)**

d)Explain the changes you have started in (c) above. **(3mks)**

e)State how you can set up a control experiment . **(1mk)**

3. The diagram below shows some components of a light microscope.



a) Name the parts labeled **(2mrks)**

K

M

b) State the functions of **(2mrks)**

P

Q

c) A student was viewing a prepared slide of a plant cell under high power microscope. The features of the cell were blurred. Which one of the labeled parts of the microscope would the student use to obtain:-

(i) a sharper outline of the features. **(1mrk)**

(ii) Give the formula used to calculate magnification in a light **(1mrk)**

d) A student was preparing a section of a plant cell to be viewed on a light microscope. Give a reason for each of the following steps:-

(i) Cutting a very thin section **(1mrk)**

(ii) Staining the section **(1mrk)**

(iii) Putting the section in water **(1mrk)**

4. In an experiment, a black mouse was mated with a brown mouse; all the off-springs were

black. The off-springs grew and were allowed to mate with one another. The total number

of (F2) generation off-springs was 96.

a) Using the letter symbols capital letter **B** for the gene of black color and small **b** for brown cooler, Work out the genotype of the F1 generation. **(3mrks)**

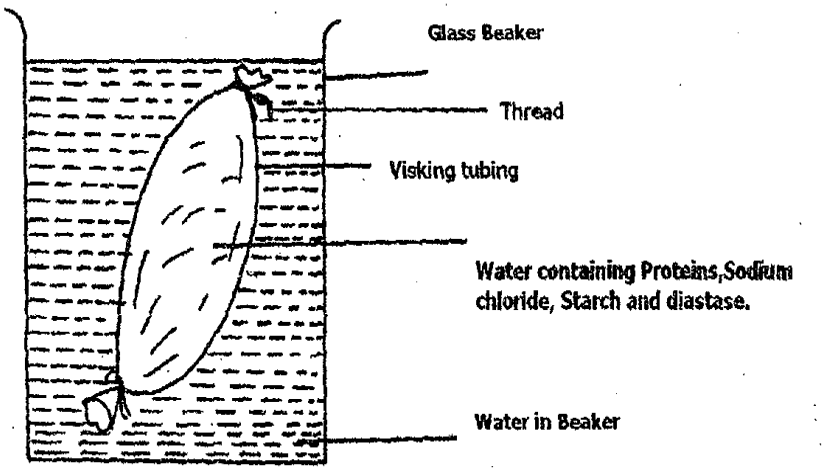
b) From the information above, work out the following for the F2 generation.

i) Genotypic ratio. **(2mrks)**

ii) Phenotypic ratio. **(1mrk)**

iiii) The total number of brown mice **(2mrks)**

5.In a physiological experiment, starch, protein, diastase and sodium chloride were added to water and put inside a visking tubing. The visking tubing was then placed in a water bath maintained at a temperature between *35* --- 40°C. The set up was as shown in the diagram below.



The following observations were made after the procedures indicated.

Contents in	At the start of experiment	After 1 hour
Visking tubing	i) Solution tastes salty	Solution tastes salty
	ii) Visking tubing is not firm	Visking tubing is firm
	iii) After boiling with Benedicts solution, solution remains blue	After boiling with Benedicts solution the solution turns brown
	iv) On addition of solution hydroxide followed by copper sulphate solution to the solution, the colour changes to purple	On addition of sodium hydroxide followed by coppers sulphate to the solution, the colour changes to purple
Beaker	i) Water is tasteless	Solution tastes sweet/salty
	ii) After boiling solution with Benedicts solution, Blue colour remains	After boiling solution with Benedicts solution, colour turns to brown
	iii) On addition to sodium hydroxide	On addition of sodium hydroxide followed by copper

	followed by copper sulphate solution, colour remains blue	sulphate solution, colour remains blue

a) Name the process by which salt moved into the water in the beaker from the visking tubing **(1mark)**

b) i) Name the food substance responsible for the brown colour observed after 1 hour

both in the beaker and visking tubing when solutions are boiled with benedicts solution **(1mark)**

ii) Account for the observation in (b i) above. **(3marks)**

c) i) Name the food substance tested with sodium hydroxide followed by copper sulphate

solution(s) **(1mark)**

ii) Account for the absence of the food substance named in (c i) above in the beaker after 1 hour. **(1mark)**

d) After one hour the visking tubing was firm. State the term used to describe this state **(1mark)**

SECTION B(40 MARKS)

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

6.An experiment was carried out whereby three healthy rats were fed on equal amounts of glucose. After half an hour, the glucose concentration per ml. of blood was measured at 15 minutes intervals for three hours. The following results were obtained.

Glucose conc. / Rats	**0 min**	**15 min**	**30 min**	**45 min**	**60 min**	**75 min**	**90 min**
A	0.800	0.774	0.715	0.680	0.650	0.595	0.555

B	0.745	0.695	0.695	0.660	0.635	0.600	0.545
C	0.795	0.695	0.665	0.635	0.590	0.550	0.495
Mean	0.780	0.720	0.691	-	0.625	-	0.532

a.i) Calculate the mean concentration of glucose in mg per ml of blood at 45 and 75 minutes. Record your answer on the table. **(2mks)**

ii) On the graph paper provided, plot a graph of the mean glucose concentration against time **(6mks)**

(provide a graph paper)

iii) What was the mean glucose concentration in the blood after 37.5 minutes? **(1mk)**

iv) Give a reason why it was necessary to use three rats in the experiment instead of one **(1mk)**

v) Why was the initial concentration of glucose in the rats not the same? **(2mks)**

vi) Account for the difference in mean glucose concentration during the period. **(3mks)**

b) Give ***two*** reasons why glucose is the main respiratory substrate. **(2mks)**

c) Give three ways in which glucose is assimilated in the body. **(3mks)**

7.a) What assumption are made when using the captured recapture method in estimating population of animals. **(5mks)**

b)Describe how you would use the capture – recapture method to estimate the population of fish in the school pond. **(15mks)**

8.(a) Define natural selection. **(2mks)**

(b) Natural selection brings about adaptation of a species to the environment. Discuss. **(18mks)**

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

TOP STUDENT KCSE PREDICTIONS

SERIES 1 TRIAL 3 BIOLOGY PAPER 1

Kenya Certificate of Secondary Exams

TIME: 2 HOURS

INSTRUCTIONS:

(a) *Write your* ***name, class, admission number*** *and* ***index number*** *on the space provided.*

(b) *Answer* ***all*** *the questions in the spaces provided*

(c) *Candidates should check to ensure that all the pages are printed as indicated and that no questions are missing.*

(d) *This paper consists of* ***10 pages.***

1. **(a)** Define the following terms as used in Biology.

(i) Chemosynthesis **(1 mark)**

(ii) Mutualism **(1 mark)**

(b) State the importance of photosynthesis in nature. **(2marks)**

2. What is the importance of the stroma in the chloroplast? **(2marks)**

3. Name ***two*** cell structures that synthesize the following cell organelles.

(a) Ribosomes **(1mark)**

(b) Lysosomes **(1mark)**

4. Name ***three*** plant leaf excretory products. **(3marks)**

5. A student mixed a sample of urine from a patient with Benedict's solution and boiled the mixture. The color changed to orange.

(a) What was present in the urine sample? **(1mark)**

(b) What did the student conclude about the health status of the patient? **(2 marks)**

(c) Which organ in the patient may not be functioning properly? **(1mark)**

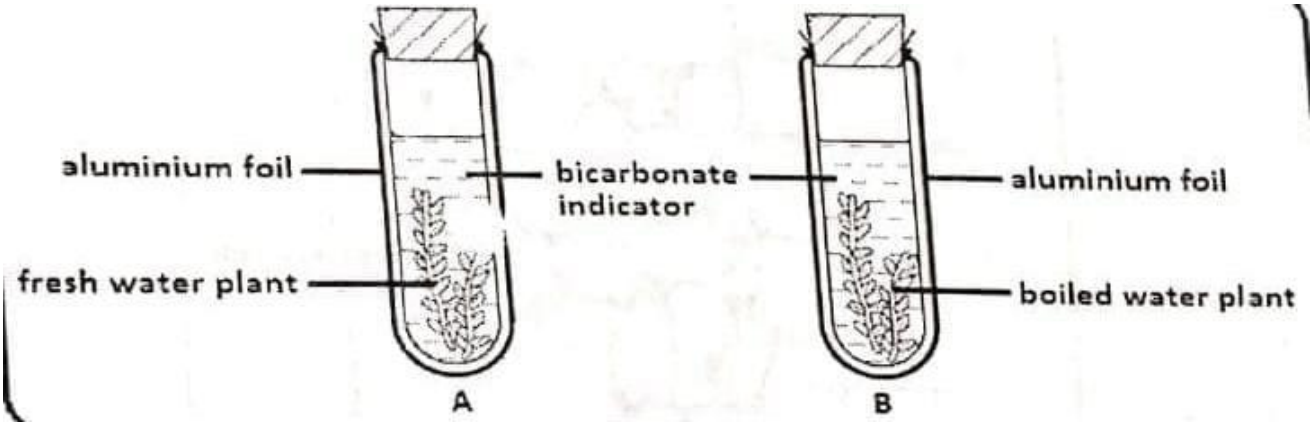
6. Name ***two*** types of values in the heart. **(2marks)**

7. Sometimes when one stands up very quickly after a long period of sitting, she may feel faint or dizzy. Explain. **(2 marks)**

8.The cardiac muscles are said to be myogenic. What is the meaning of the term myogenic.

9.A Form 3 student carried out an experimental set up as shown below.

Bromothymol blue is sensitive to pH change (bromothymol is yellow in low pH)



(a) What was the aim of the experiment? **(1 mark)**

(b) Why was set up B included in this experiment? **(1 mark)**

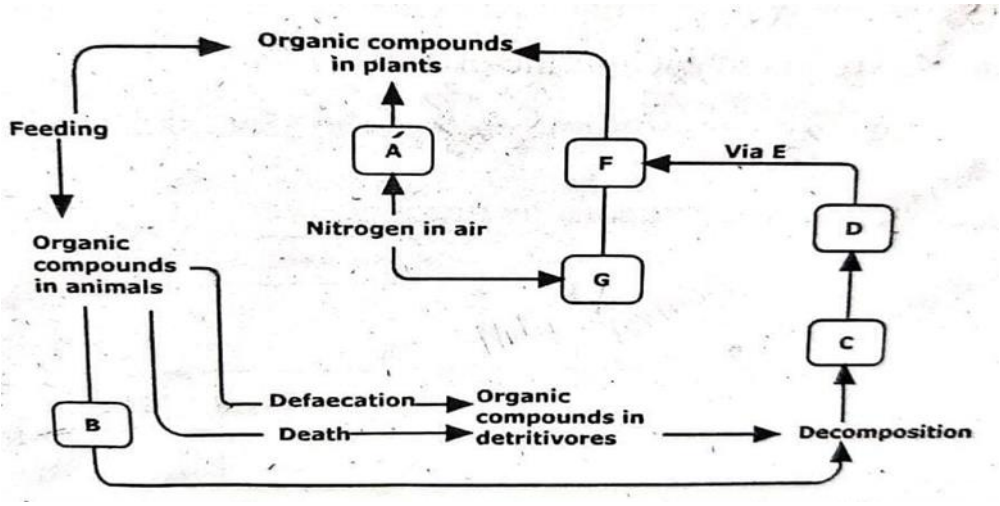
(c) Why was aluminium foil used in this experiment? **(1 mark)**

(d) Explain why bromothymol changed its color from blue to yellow in tube A after 30 minutes. **(1 mark)**

10. Differentiate between the cell wall found in fungi and the one in plants. **(2 marks)**

11. State ***three*** adaptations that enable prey to evade predators. **(3 marks)**

12. The diagram below represents a simplified trend of nitrogen circulation in an ecosystem.



(a) What is the descriptive term applied to each of the organisms **A** and **D**.

A-

D-

(b) Name each of the processes. **(3 marks)**

(i) Marked **B**

(ii) Facilitated by organisms **D**

(iii) One group of organisms that can act as saprophytes

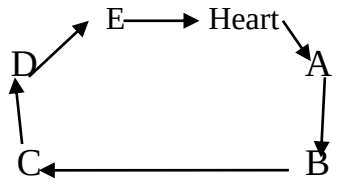
(c) Name the chemicals **C, F** and **E**.

C-

F-

E-

13. The diagram below is a summary of the sequence of blood flow through the heart and associated blood vessels.



(a) Name the blood vessels labelled **A** and **E**. **(2 marks)**

A

E

(b) State ***two*** differences between blood vessel **B** and **D**. **(2 marks)**

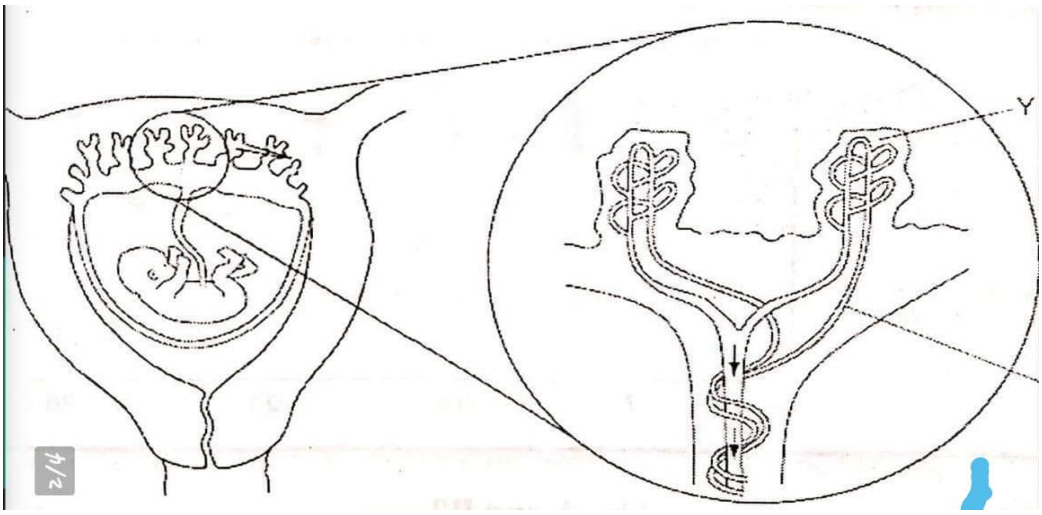
(c) State ***two*** adaptations of the blood vessel labeled **C** to its functions. **(2 marks)**

14. How does light as a biotic factor influence the distribution of plants in an ecosystem? **(3 marks)**

15. Seed germination is affected by certain plant growth regulators.

Describe ***two*** actions of gibberellins during seed germination. **(2 marks)**

16. The diagram below shows a foetus in the uterus.



(a) Name ***two*** substances that will be at a higher concentration at Y that at X. **(2 marks)**

(b) State ***two*** observable adaptations of the placenta to its functions. **(2 marks)**

17. **(a)** Name the genetic disorder in humans that is characterized by inability of blood to clot**.** **(1 mark)**

(b) A female human was found to have an extra sex chromosome in her cells.

(i) Give the total number of chromosomes in the male individual's cells.

(1 mark)

(ii) Explain the possible causes of this condition. **(2 marks)**

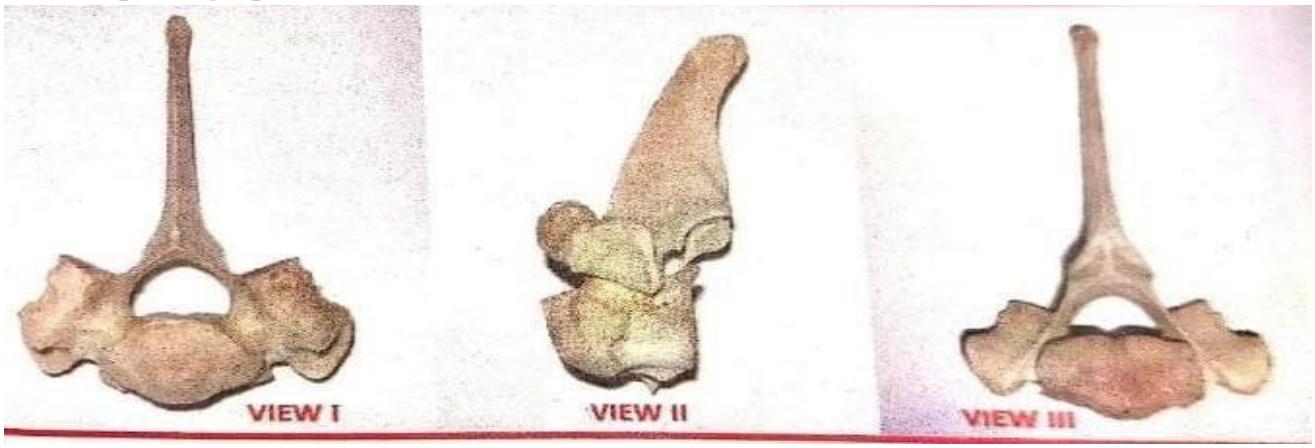
(iii) State ***two*** physical characteristics observed in the female individual with such a condition. **(2 marks)**

18. **(a)** Explain why fossil records as evidence of organic evolution are usually incomplete. **(3 marks)**

(b) Name the evidence of organic evolution exhibited by occurrence of similar amino acid molecules in a range of organisms. **(1 mark)**

19. Bumble bees are insects that live in the arctic tundra. They have adaptations to keep their body temperature above that of the environment. One adaptation is shivering which involves rapid muscle contraction. A second adaptation is a very hairy body. Explain how those adaptations help to keep the body temperature above that of the environment. **(3 marks)**

20. The photograph below shows a bone from an animal.



(a) **(i)** Identify the bone shown. **(1 mark)**

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

(b) Name the body region from which the bone was obtained. **(1 mark)**

(c) State ***three*** adaptations of the bone in the photograph to its functions. **(3 marks)**

21. The photograph below shows a potted plant in horizontal position.

(a) Name the type of response shown. **(1 mark)**

(b) State the biological significance of the response above to the plant. **(1 mark)**

(c) Explain the mechanisms of the response. **(4 marks)**

(d) **(i)** State the class to which the plant belongs. **(1 mark)**

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

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

TOP STUDENT KCSE PREDICTIONS

SERIES 1 TRIAL 3 BIOLOGY PAPER 2

Kenya Certificate of Secondary Exams

TIME: 2 HOURS

Instructions to Candidates

(a) *This paper consists of* ***two sections; A*** *and* ***B****.*

(b) *Answer* ***all*** *the questions in* ***section A*** *in the spaces provided after each question.*

(c) *In* ***section B answer question 6 (compulsory)*** *and* ***either question 7 or 8*** *in the spaces*

provided after ***question 8****.*

(d) *Candidates should answer the questions in English*

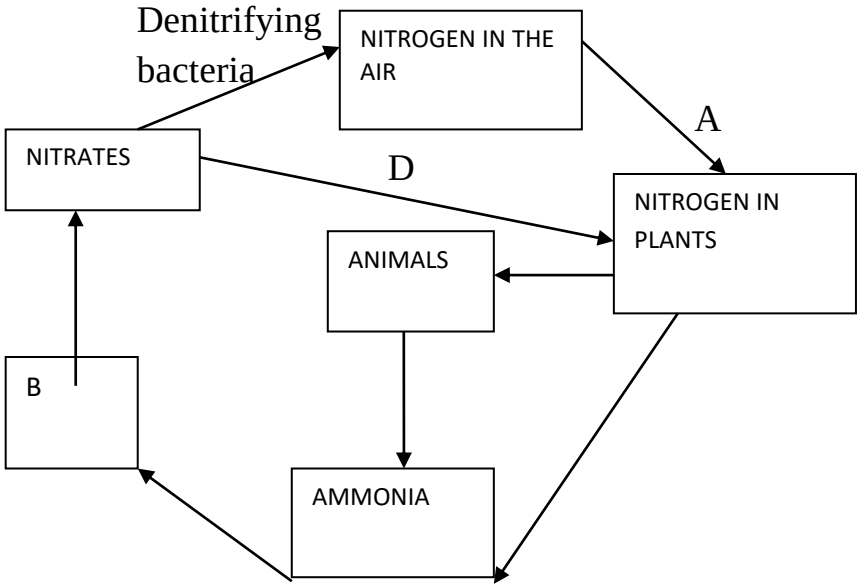
For Examiner's Use Only

SECTION	QUESTIONS	MAXIMUM SCORE	CANDIDATE SCORE
A	1		
	2		
	3		
	4		
	5		
B	6		
	7		
	8		

TOTAL SCORE		

1.The diagram below represents the nitrogen cycle.

The diagram below represents the nitrogen cycle.



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

(ii) Name the group of organisms represented by **E**. **(1mark)**

(iii) State the process labelled A and D. **(2 marks)**

(iv) **a)** Name the part of the plant where nitrogen fixation takes place.

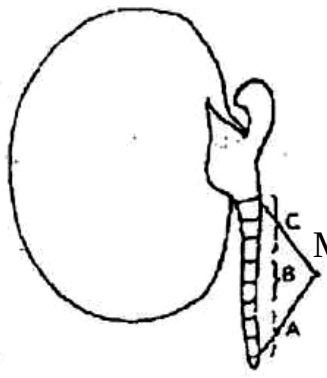
(1mark)

(b) What is the effect of denitrifying bacteria in the soil? **(1mark)**

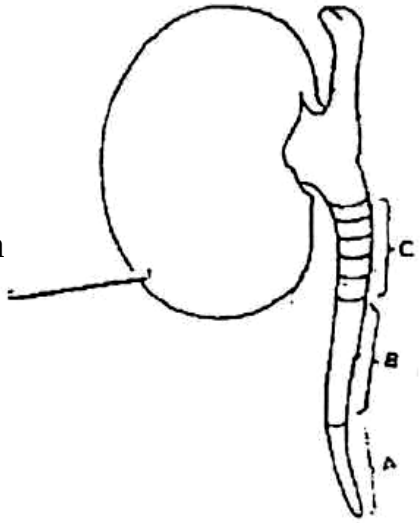
(v) How would excess pesticides in the soil interfere with Nitrogen fixation?

(2 marks)

2. The diagram below shows the results obtained in an experiment on graph of a bean seedling.



Marks made with



Waterproof ink

After 5 days

Start of Experiment End of Experiment

a) Suggest the aim of the experiment. **(1 mark)**

b) State the processes that occur in each of the regions marked A, B and C.**(3 marks)**

c) Account for the observations made in the regions A and C. **(4 marks)**

3. a) What is meant by the term linked genes? **(1 mark)**

b) Hemophilia is a genetic condition transmitted through a recessive gene linked to **X**

chromosome. The normal gene may be represented by $\mathbf{X^H}$**.**

i) What is the genotype of a hemophilic female? **(1 mark)**

ii) A woman who is a carrier for the hemophilia gene marries a normal man. Work out the phenotypic ratio for their offspring. **(4 marks)**

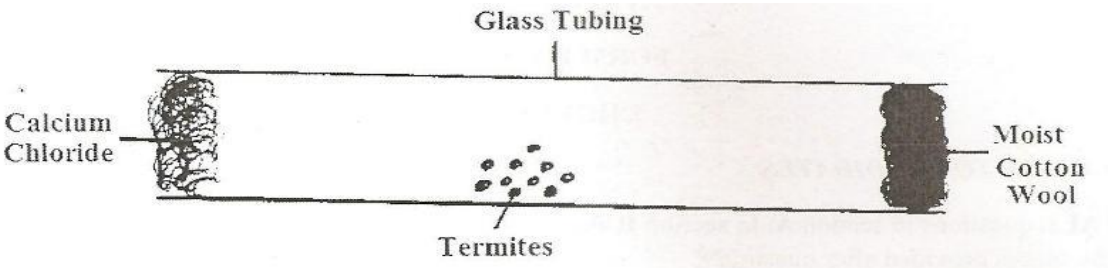
iii) Hemophilia is more common in males than in females. Explain this phenomenon. **(2 marks)**

4. A climbing plant twines around the stem of a tall tree.

(a) (i) Name the type of response exhibited by the climbing stem.**(1 mark)**

(ii) Explain how the response named in (a) (i) above takes place.**(3 marks)**

(b) An experiment was carried out to investigate the response of white termites to a certain stimulus. Ten termites were placed at the centre of glass tubing. Calcium chloride was placed one end of the tubing and moist cotton wool at the other end as illustrated below.



(i) What observations are made after 20 minutes? **(1 mark)**

(ii) What type of response is exhibited by the termites? **(1 mark)**

(iii) What is the survival value of the above response? **(1 mark)**

(iv) What is Photonasty? **(1 mark)**

5. A group of students set up the following experiments to investigate the factors that affect enzymes.

Tube 1	Tube 2	Tube 3	Tube 4
Egg white Amylase/ptyalin at 30^{o} C	Boiled starch Dilute acid Amylase 36^{0}C	Boiled starch Amylase	Boiled starch Boiled Amylase

a) Identify the property of enzymes being investigated in tubes 1 and 2 **(2 marks)**

b) After 3 hours thee students tested the content in the four tubes for starch. They obtained the following results in tube 2, 3 and 4.
Tube 2 – Blue – black color
Tube 3 – Brown color of iodine remained
Tube 4 – Blues black color.
Account for the results obtained in tube 3 and 4. **(2 marks)**

c) What results would you expect in tube 3 if temperature was maintained at 5^{o}C? Give a reason for your answer. **(2 marks)**

d) Name ***two*** enzymes found in the pancreatic juice **(3 marks)**

SECTION B (40marks)

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

6. The table below contains information on changes that occur in a river, downstream from a sewageoutflow.

Distance downstream from point of sewage entry(m)	Concentration of dissolved oxygen (%)	Number of organisms (arbitrary units)		
		Bacteria	Algae	Fish
0	95	88	20	20
100	30	78	8	6
200	20	74	6	2
300	28	60	20	0
400	42	50	40	0
500	58	48	70	0
600	70	44	84	0
700	80	42	90	0
800	89	38	84	0
900	95	36	68	4
1000	100	34	54	20

a)Plot a graph of number of organisms against distance downstream. (7 marks)(Provide graph paper)

b)Describe the changes in the concentration of oxygen dissolved in the water downstream fromthe point of sewage entry.

(2 marks)

c)Account for the changes in the numbers of each of the following organisms downstream.

i. Bacteria **(3 marks)**

ii. Algae **(3marks)**

d)State ***two*** ways in which the degree of water pollution caused by sewage can be reduced. (2marks)

6. a) Explain ***three*** reasons why plants lacks well developed excretory organs. **(3 marks)**

b) Name ***three*** ways in which plants excrete waste products.**(3 marks)**

c) State and explain the economic importance of plants excretory products. **(14 marks)**

8.Describe how the various parts of the human digestive system are adapted to their functions. **(20 marks)**

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

TOP STUDENT KCSE PREDICTIONS

SERIES 1 TRIAL 4 BIOLOGY PAPER 1

Kenya Certificate of Secondary Exams

TIME: 2 HOURS

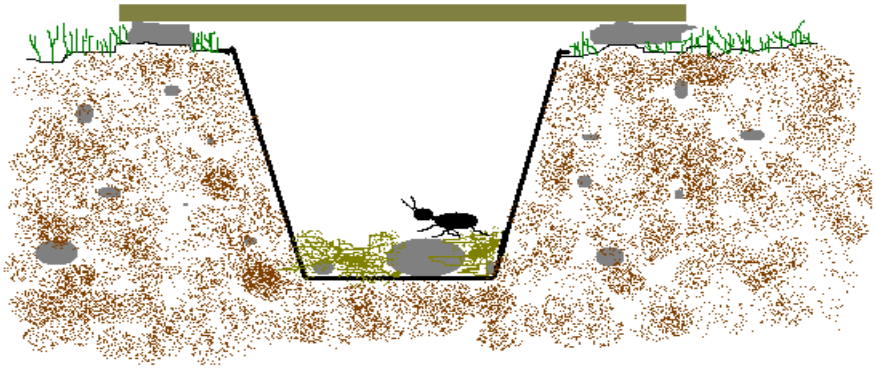
INTRUCTIONS

- *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 after each question*
- *In Section **B**, answer question **6 (compulsory)** in the spaces provided and either question **7** or **8** in the spaces provided after question **8**.*
- *Answers must be written in English only.*

For Examiner's Use Only:

QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
1- 31	80	

1. State the branch of Biology that would be used in solving the problem of disputed parentage. **(1mark)**
2. A young scientist observed a bird laying her eggs in a nest and later the eggs hatched into chicks. Name two characteristics shown by the chicks that show a chick is a living thing but an egg is not. **(2marks)**
3. Study the diagram below and answer questions that follow



(i) What is the name given to the apparatus shown above **(1 mark)**

(ii) What is its use in Biological studies? **(2 marks)**

4. a) A form two student observed the leaf shown below.

a) Name the process shown by the leaf. **(1mark)**

b) Differentiate between the process shown above and transpiration **(2marks)**

5. A certain species of flowering plant relies entirely on sexual reproduction for propagation. The Chromosome number of the cell in the ovarian wall is 16.

a) The pollen tube nucleus. **(1mark)**

b) A cell of the endosperm. **(1mark)**

6. a) What are fossils? **(1mark)**

b)State **two** limitations of the use of fossils as an evidence of evolution. **(2marks)**

7. Name the disease of the blood characterized by,

a)Abnormally large number of white blood cells **(1mark)**

b)Crescent –shaped hemoglobin **(1mark)**

8. a) State ***two*** roles of hydrochloric acid secreted by the stomach wall. **(2marks)**

(b) Name the cells that secrete the above component. **(1mark)**

9. Name the organisms that cause each of the following diseases

i) Amoebic dysentery. **(1mark)**

ii) Bilharzia **(1mark)**

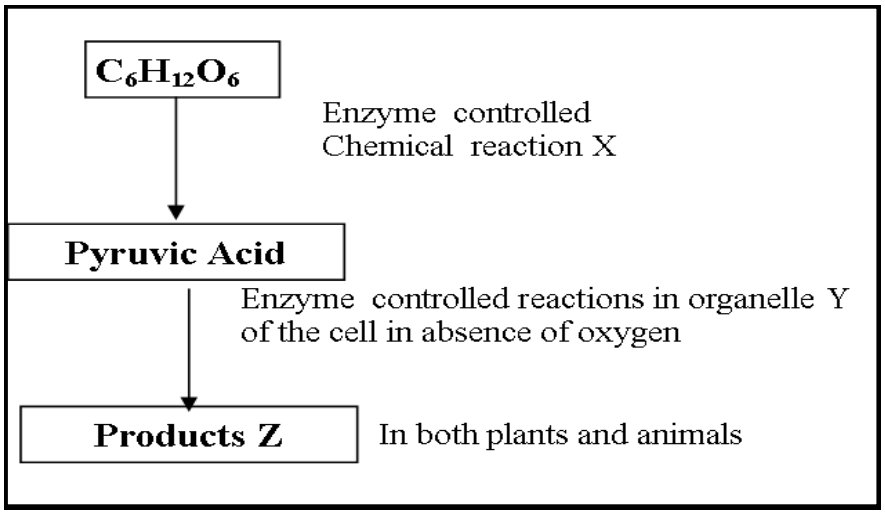
10. Explain how marine fish regulate their osmotic pressure. **(3marks)**

11.A rhinoceros in a national park was found to be infected with ticks. State the trophic level occupied by the :

(i) Rhinoceros. **(1mark)**

(ii) Ticks **(1mark)**

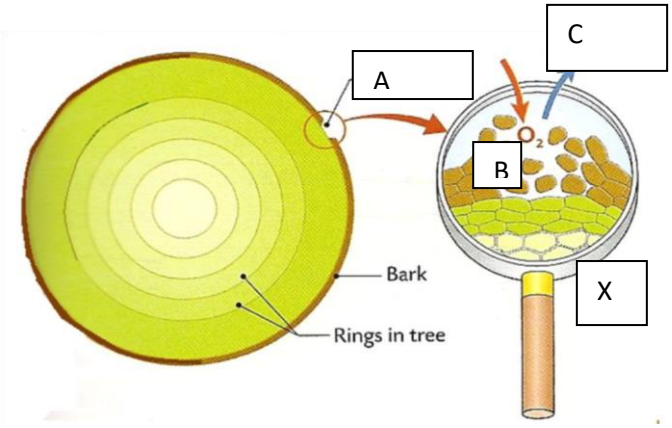
12. Study the flow chart below of a process that takes place in both plants and animals.



a) Name the above process. **(1mark)**

b) In the above process name the chemical reaction represented by X. **(1mark)**

13. The diagram below shows a gaseous exchange structure in the stems of angiosperms.



Name;

a) Part labelled **A.** **(1 mark)**

b) Apparatus **X.** **(1 mark)**

c) Substances represented by arrows B and C. **(2 marks)**

B-

C-

14. When blood is flowing through a vena cava, which main blood vessel will it flow through next? **(1mark)**

15. Below is an image of a biological vector. Use it to answer questions that follow.

(a) Identify the parasite transmitted into human blood by the organism. **(1 mark)**

(b) Name the blood cells that are destroyed by the parasite in (a) above. **(1 mark)**

(c) State one biological method used to eradicate the larvae of these organisms. **(1 mark)**

16. Give the structural adaptations of the following in an insect pollinated plant.

(a) Pollen grain. **(1 mark)**

(b) Stigma. **(2 mark)**

17. Use the illustration below to answer questions that follow.

(a) Identify the type of pollution that has such an effect. **(1 mark)**

(b) State ***two*** effects of the type of pollution identified in (a) above to the organism. **(2 marks)**

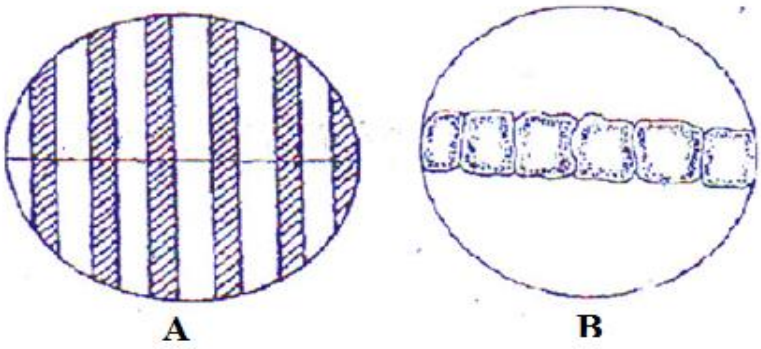
18. Identify the following types of responses:

(a) Pollen tube growing towards the ovary **(1 mark)**

(b) Maggots moving away from light. **(1 mark)**

19. State ***two*** activities of the cell that are controlled by the nucleus. **(2 marks)**

20. The field of view of a light microscope appeared as shown below in diagram A and the diameter in A was occupied by cells as shown in B.



Calculate the length of one cell. **(3 marks)**

21. State two importance of water in germination of seeds. **(2 marks)**

22. Why is sexual reproduction advantageous in flowering in plants? **(2 marks)**

23. Below is an illustration of an organism captured by students during a practical lesson.

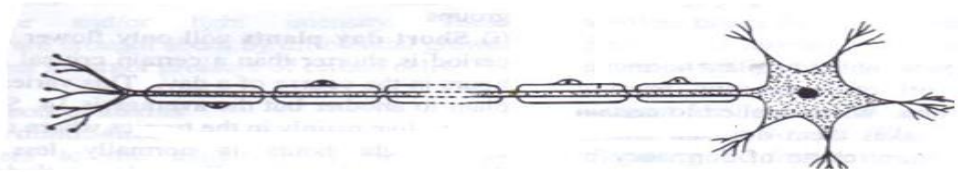
(a) Identify **three** features that enable the organism to be placed in the phylum Arthropoda. **(3marks)**

(b) Explain why the organism will die when Vaseline is applied on its thorax. **(1 mark)**

24. State the significance of natural selection. **(2 marks)**

25. Explain why a plant shoot develops lateral branches when its tip is removed. **(2 marks)**

26. The diagram below shows the structure of a neuron.

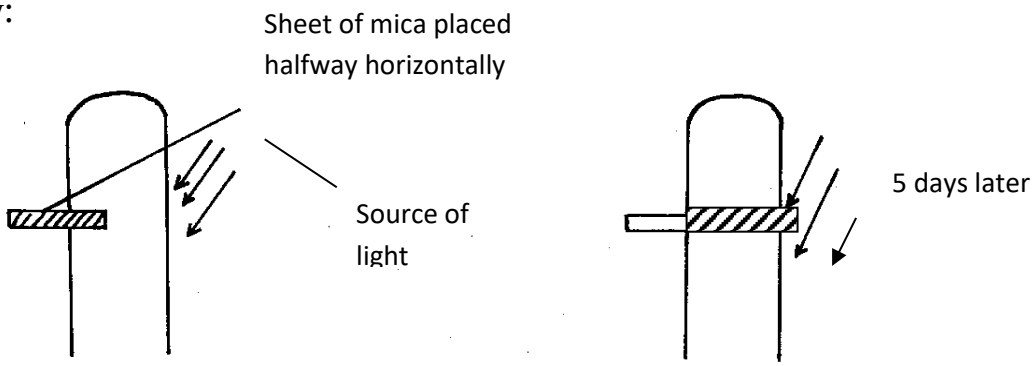


(a) Identify the neuron and state its function **(2 marks)**

(b) Name the part of the brain that is involved in learning and memory. **(1 mark)**

27. Explain what happens to the structures of the human eye when a student reading a white printed paper on a bright sunny day enters a dark room for examinations. (3 marks)

28. The experiment below was carried out by form four students. The result was recorded below:



Explain why the shoot doesn't bend towards the light. **(3marks)**

29. In an investigation, a group of students came across animals living in the following habitats. What was the likely main nitrogenous waste product of each in its habitat?

(3marks)

Habitat	**Nitrogenous waste**
Terrestrial	
Fresh water	
Marine	

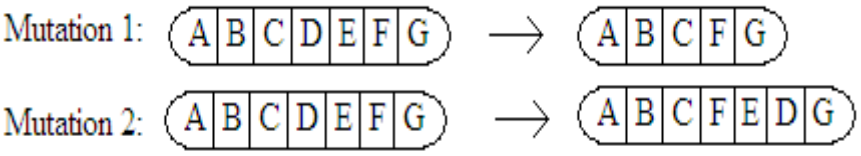
30. State the functions of each of the following parts of male reproductive system **(3marks)**

a. Sertoli cells

b. Epididymis

c. Seminiferous tubules

31. The diagram below shows various types of gene mutations..



a. Identify the type of gene mutation shown above. **(2marks)**

Mutation 1

Mutation 2

b)Distinguish between gene and chromosomal mutations **(2mark)**

NAME…… ADM NO……

SCHOOL……..CLASS……

DATE……

TOP STUDENT KCSE PREDICTIONS

SERIES 1 TRIAL 4 BIOLOGY PAPER 2

Kenya Certificate of Secondary Exams

TIME: 2 HOURS

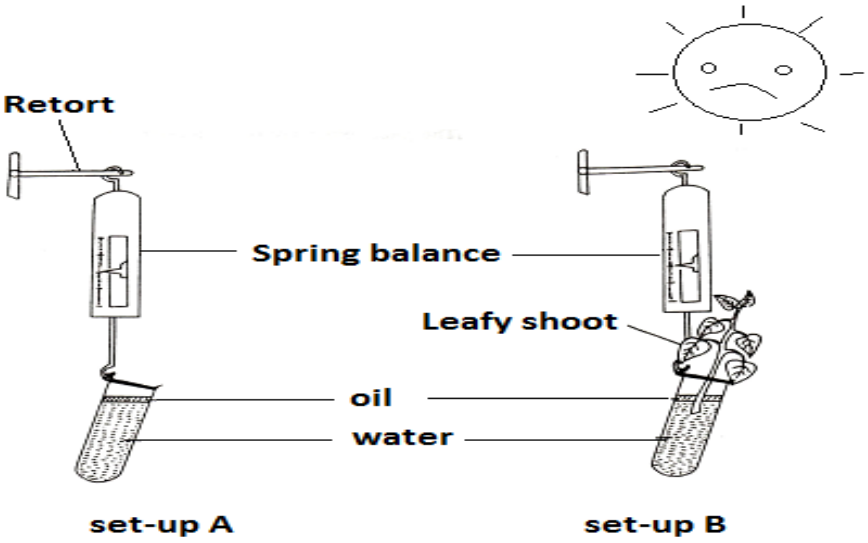
INSTRUCTIONS TO CANDIDATES

- *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.*

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**	

SECTION A (40 MARKS)

1. The set below was used to investigate a certain physiological activity in plants. The two set ups were left under a hot sun for several hours. Study it carefully to answer the questions that follow.



(a) What physiological process was being investigated? **(1 mark)**

(b) What was observed in set-up A and B at the end of the experiment **(2 marks)**

A-

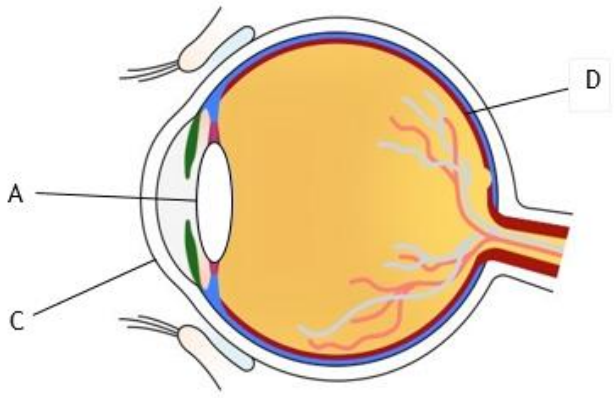
B-

(c) Explain your answer in the (d) above for set-up B. **(2 marks)**

(d) What do you understand by the terminology guttation? **(1 mark)**

(e) Explain how wilting of leaves during a hot day is advantageous to a plant **(2marks)**

2. The diagram below illustrates the structure in the human eye.

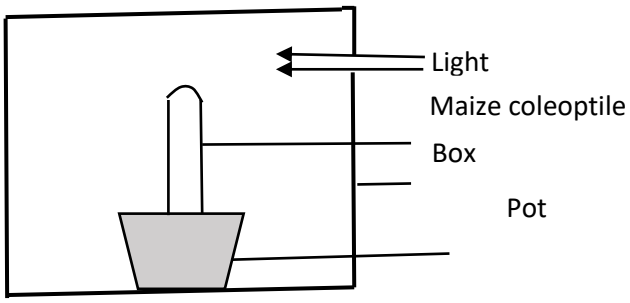


(i) State one way in which the part labelled c is suited to its function **(1mark)**

(ii) State the functions of the cells in the part labelled **D** **(2marks)**

(iii) State the changes that occur in part A to facilitate vision of a distance **(2marks)**

b) A student set up an experiment as shown below.



The set up was left for three days.
Account for the expected results after three days **(3marks)**

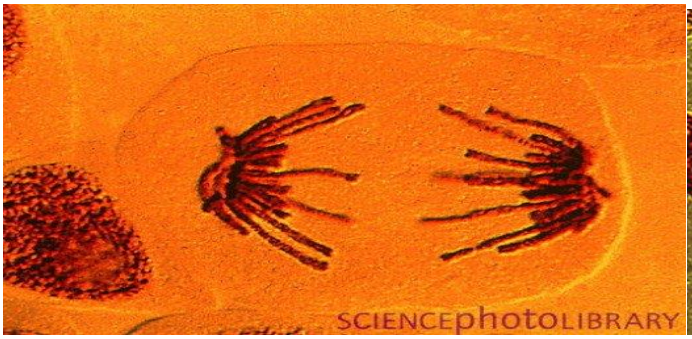
3. Tongue rolling is dominant over the inability to roll tongue. The father of a family can roll his tongue while the mother cannot. Half of their children can roll the tongue while the other half cannot. Use letter R to denote the tongue rolling trait.

a) Explain with the help of a diagram why only half of the children in the case above inherit the tongue rolling trait from their father. **(4 marks)**

b) If all children could roll the tongue, then what would be the genotype of the mother and father? Explain your answer using a punnet square. **(4 marks)**

c) The micrographs below are of a tissue showing mitosis. Examine it and answer the questions.

R **T**



a.) i. Identify the tissue from which the micrographs were obtained **(1mark)**

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

Name the stages represented by **R** and **T**. **(2marks)**

R-

T-

b) State ***two*** significance of mitosis to an organism. **(2 marks)**

c.) Name ***two*** regions in higher plants where cells actively undergo mitosis. **(2marks)**

d) During a laboratory investigation, a scientist extracted gastric juice from the mammalian stomach. He used it to carry out tests on a food sample B which was suspected to contain proteins. He divided the food sample B into three portions and treated them as below.

I. On the 1st portion of B, he added Gastric juice and mixed them thoroughly before adding sodium hydroxide followed with copper (II) sulphate drop by drop.

II. On the 2nd portion of B, he added boiled gastric juice and mixed them thoroughly before adding sodium hydroxide followed with copper (II) sulphate drop by drop.

III. On the 3rd portion of B, he added Gastric juice, sodium bi-carbonate and mixed them thoroughly before adding sodium hydroxide followed with copper (II) sulphate drop by drop.

a)State the observations he made in each set up. **(3marks)**

1st portion…

2nd portion

3rd portion

b) Why was the experiment on the 1st portion included in the tests? **(1mark)**

c) Name the property of the chemical being investigated in these tests. **(1mark)**

d) Account for the observations made in 2 (a) above. **(3marks)**

SECTION B (40MARKS)

Answer question 6 (compulsory) then choose any between question 7 and 8

6. An experiment was carried out to investigate the effects of dilute sulphuric acid on the growth of plant seedlings. Batches of seedlings were grown in glass dishes on filter paper to which dilute sulphuric acid was added. The dishes were then incubated. The root and shoot lengths were measured after 65 hours. The results obtained are shown in the table below.

Sulphuric acid concentration (mol/dm^{-3})	**Mean root length (mm)**	**Mean shoot length (mm)**
0	55.5	25.2

1×10^{-3}	63.4	18.4
3×10^{-3}	6.5	9.5
4×10^{-3}	2.0	4.6
6×10^{-3}	1.8	0.8
7×10^{-3}	1.5	0.5
8×10^{-3}	1.3	0.3
9×10^{-3}	1.3	0.0
10×10^{-3}	1.0	0.0

(a) Plot a graph of the mean root length and the mean shoot length against the sulphuric acid concentration on the same grid.(provide a graph paper) **(7 marks)**

(b) Describe the relationship between the concentration of sulphuric acid and the:-

(i) Growth of shoots **(2 marks)**

(ii) Growth of the roots **(2 marks)**

(c) Estimate the mean root and the mean shoot lengths when the concentration of sulphuric acid is 5×10^{-3} **(2 marks)**

(d) State **two** other effects of acid rain. **(2 marks)**

(e) State **three** ways of preventing acid rain. **(3 marks)**

(f) Name two other gases with the same effect Sulphur (IV) oxide gas in the atmosphere. **(2mark**

7.a) Describe the mechanism of inhalation and exhalation in **(14marks)**

b). Explain **three** factors that affect rate of breathing **(6marks)**

8 a) Describe the process of double fertilization in flowering plants. **(15marks)**

b) Describe what happens to the various parts of a flower after **(5 marks)**

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

TOP STUDENT KCSE PREDICTIONS

SERIES 1 TRIAL 5 BIOLOGY PAPER 1

Kenya Certificate of Secondary Exams

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided.

Answer ALL the questions in the spaces provided,

FOR EXAMINERS USE ONLY

Question	Maximum score	Candidates score
1-27	80	

1. Explain the following terms.

a) Taxonomy **(1mrk)**

b) Species (**1mrk)**

2. State ***three*** features used in classifying arthropods into classes. **(3mrks)**

3. a) Name the substance that accumulates in muscles when respiration occurs with insufficient Oxygen. **(1mrk)**

b) Give the ***three*** end products of anaerobic respiration in plants. **(3mrks)**

4. a) State ***three*** characteristics of a wind pollinated flower. **(3mrks)**

b) Explain why sexual reproduction is important to organisms. **(1mrk)**

5. State the functions of the following organelles.

a). Lysosomes **(1mrk)**

b). Golgi apparatus **(1mrk)**

6. What is the role of vascular bundles in plant nutrition? **(3mrks)**

7. Haemophilia is a genetic disorder which is transmitted through a recessive gene linked to the X chromosome. Using H to represent the normal gene and h for haemophilia, work out the genotypic ratio of the offspring of a marriage between a woman who is carrier for haemophilia gene and a normal man. **(4mrks)**

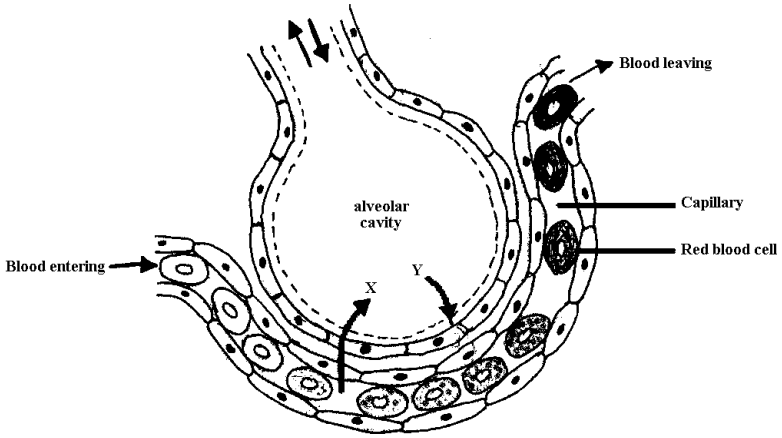
8. a) In what form does energy enter the earth's ecosystem? **(1mrk)**

b) What is the main source of energy in an ecosystem **(1mrk)**

c) In what form does energy transferred from one trophic level to another **(1mrk)**

d) If only a small fraction of energy is transferred from one trophic level to another, what happens to the rest of the energy? **(1mrk)**

9. The diagram below represents gaseous exchange in the alveolus.



a). Identify the gases labeled **X** and **Y.** **(2mrks)**

b). Trace the path followed by gas Y from alveolar space until it reaches the red blood cells. **(3mrks)**

c). Name the part of the brain that controls breathing movement in humans. **(1mrk)**

10. The table below shows the energy use per day in kilojoules

Age(years)	Male	Female
2	5,500	5,500
5	7,000	7,000
8	8,800	8,000
11	10,000	9,200
14	12,500	10,500

18	14,200	9,600
25	12,100	8,800

a). From the table, explain why after age 8 males require more energy than females. **(1mrk)**

b). Other than sex and age, name three other factors that determine energy requirements in human beings **(3mrks)**

11. **a)** Define organic evolution. **(1mrk)**

b). Give the role played by variation in the process of evolution. **(2mrks)**

12. **a)** What are halophytes? **(1mrk)**

b) State three adaptations of halophytes to their habitats**.** **(2mrks)**

13. **a)** Name the causative agent of the following diseases in humans. **(2mrks)**

Syphilis

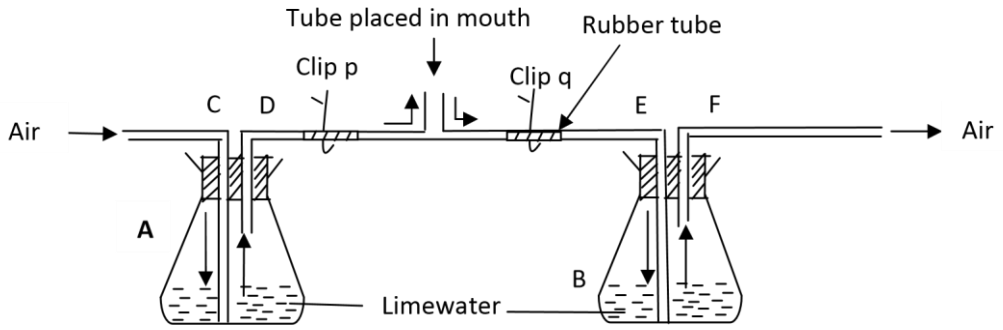
Herpes

b). State the functions of the following structures**.** **(2mrks)**

Fallopian tube

Amniotic fluid

14. An experiment was set up as shown below to compare the amount of carbon (iv) oxide in expired and inspired air.



a). State the purpose of the clip **(2mrks)**

i). P

ii). Q

b). Compare the observations in flask A and B after the experiment. Give reasons for your answer. **(2mrks)**

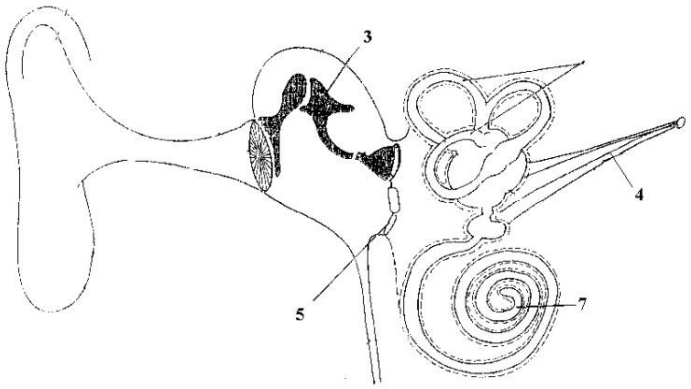
15. Name the form in which carbohydrates are stored in. **(2mrks)**

i). Plants tissues

ii). Animal tissues

16. Explain how water is gained from the soil by root hairs in plants. **(3mrks)**

17. The diagram below shows the human ear.



a). Name the structures labeled 3, 4 **(2mrks)**

b). State the function of the parts labeled 5 and 7. **(2mrks)**

18. Give the survival value of the following tropic responses

a). Geotropism **(1mrk)**

b). Haptotropism **(1mrk)**

c). Chemotropism **(1mrk)**

19. Distinguish between single and double circulatory systems. **(1mrk)**

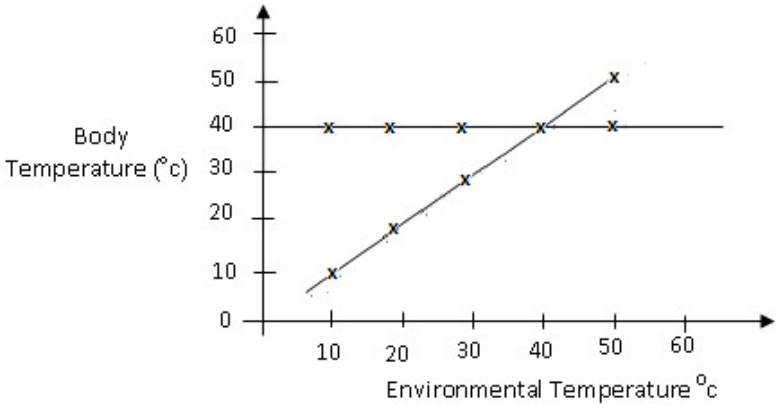
20. Name one disorder caused by a dominant gene. **(1mrk)**

21. Name the spore producing structures in pteridophytes. **(1mrk)**

22. a). Define transpiration. **(1mrk)**

b). State ***<u>two</u>*** environmental factors that decrease the rate of transpiration **(2mrk)**

23. The graph below shows the relationship between environmental temperature and the body temperature in two different animals A and B.



a). State the relationship between the body temperature of animal A and external environmental temperature. **(1mrk)**

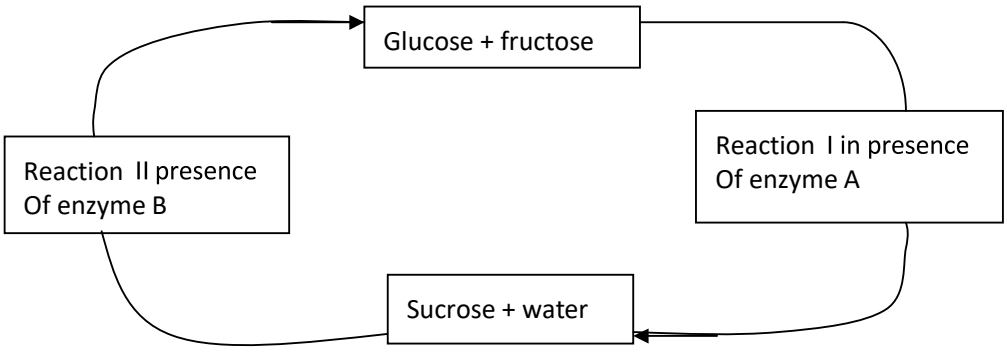
b). Give the term used to describe;

i). Animals of type (**1mrK)**

ii). Animals of type **(1mrk)**

24. Nitrogen in the atmosphere cannot be directly utilized by plants. State two ways by which this Nitrogen is made available for plant use. **(2mrk)**

25. The diagram below shows chemical reaction I and II which are controlled by enzyme A and B.



Name the reaction I and enzyme B **(2mrks)**

Reaction I

Enzyme B

26. State two main functions of a microscope. **(2mrks)**

27. in what form is carbon (IV) oxide transported in blood. **(2mrks)**

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

TOP STUDENT KCSE PREDICTIONS

SERIES 1 TRIAL 5 BIOLOGY PAPER 2

Kenya Certificate of Secondary Exams

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

1. *Write your name and index number in the spaces provided.*
2. *Sign and write the date.*
3. *This paper consists of two sections. **A and B.***
4. *Answer **ALL** the questions in section A in the spaces provided.*
5. *In section **B**, answer question **6 (compulsory)** and either question **7 or 8** in the spaces provided.*

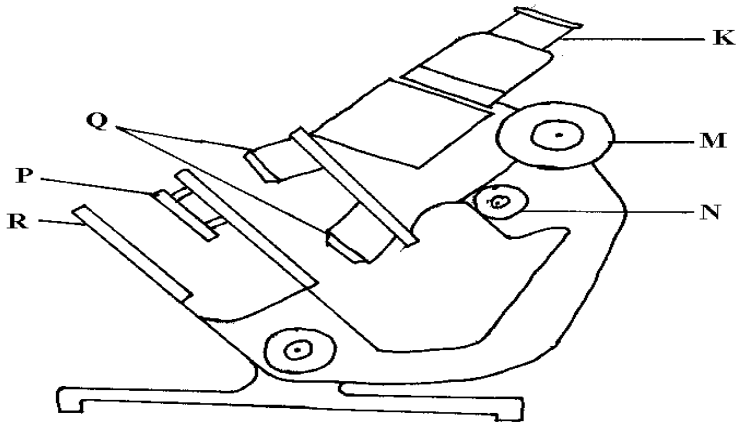
For examiners use only:

Section	Question	Maximum score	Candidates score
A	**1**	**9**	
	2	8	
	3	7	
	4	8	
	5	8	
B	6	20	
	7	20	
	8	20	
TOTAL SCORE		**80**	

SECTION A

Answer all questions in the spaces provided

1. The diagram below shows some components of a light microscope.



a) Name the parts labeled **(2mrks)**

K

M

b) State the functions of **(2mrks)**

P

Q

c) A student was viewing a prepared slide of a plant cell under high power microscope. The features of the cell were blurred. Which one of the labelled parts of the microscope would the student use to obtain:-

(i)a sharper outline of the features. **(1mrk)**

(ii) Give the formula used to calculate magnification in a light **(1mrk)**

d) A student was preparing a section of a plant cell to be viewed on a light microscope. Give a reason for each of the following steps:-

(i) Cutting a very thin section **(1mrk)**

(ii) Staining the section **(1mrk)**

(iii) Putting the section in water **(1mrk)**

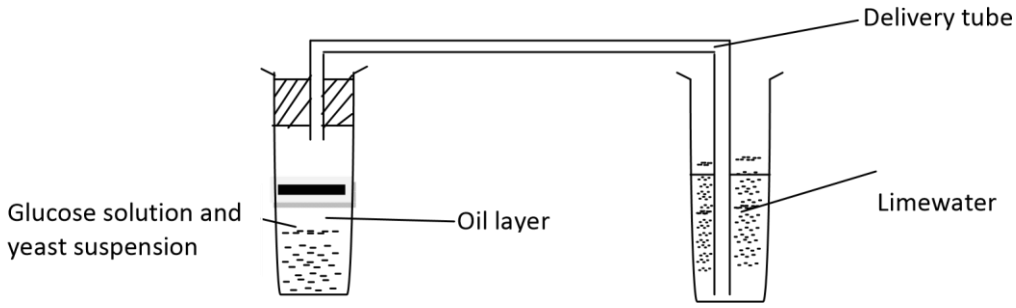
2.a) Explain what happens to excess amino acids in the liver of humans. **(4mrks)**

b).i) What would happen if a person produced less anti-diurectic hormone? **(1mrk)**

ii) What term is given to the condition described in **(b)(i)** above **(1mrk)**

c) State ***two*** portions of the human nephrone found only in the cortex of the **(2mrk)**

3. The diagram below shows a set up that was used to demonstrate fermentation.



Glucose solution was boiled and oil added on top of it. The glucose solution was then allowed to cool A B before adding yeast suspension.

a) Why was the glucose solution boiled before adding the yeast suspension **(1mrk)**

b) What was the importance of cooling the glucose solution before adding the yeast suspension? **(1mrk)**

c) What was the use of the oil in the experiment? **(1mrk)**

d) Give ***two*** reasons why accumulation of lactic acid during vigorous exercise lead to an increase in heart beat. **(2mrks)**

e). Other than carbon (iv) oxide, ***name*** the other products of anaerobic respiration in plants **(2mrks)**

4. In an experiment, a black mouse was mated with a brown mouse; all the off-springs were black. The off-springs grew and were allowed to mate with one another. The total number of (F2) generation off-springs was 96.

a) Using the letter symbols capital letter B for the gene of black color and small b for brown color, Work out the genotype of the F1 generation. **(3mrks)**

b) From the information above, work out the following for the F2 generation.

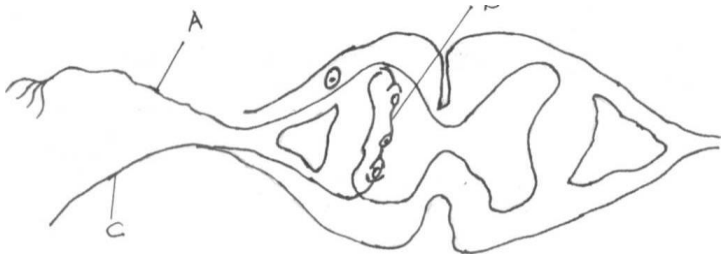
i) Genotypic ratio. **(2mrks)**

ii) Phenotypic ratio. **(1mrk)**

iiii) The total number of brown mice **(2mrks)**

5. When a person's hand accidentally touches a hot object it is quickly withdrawn, below is the diagram showing how response occurs

B



a). Describe a reflex action that will lead to the withdrawal of hand from an object. **(7mrks)**

b). Name the substance responsible for the transmission of an impulse across the synapse **(1mrk)**

SECTION B

Answer question six and any other one question from this section in the spaces provided.

6. (Compulsory)

An investigation was carried out between 1964 and 1973 to study the changes in fish population in a certain lake. Four species of fish A, B, C and D were found to live in the lake. In 1965, a factory was built near the lake and was found to discharge hot water in the lake raising the temperature from 25^{o} c to 30^{o} c. In 1967, sewage and industrial waste from a nearby town was diverted into the lake. In 1969, discharge of hot water, sewage and industrial waste into the lake was stopped.

The fish populations during the period of investigation are shown in the table below.

Fish population during the period of investigation

Fish species	1964	1966	1968	1970	1971	1971	1973
A	6102	223	20	106	660	4071	7512
B	208	30	11	22	63	311	405
C	36	100	0	0	0	0	0
D	4521	272	23	27	79	400	617

a) (i) In which year was the fish population lowest? **(1mrk)**

(ii)*State* the factors that might have caused the lowest fish populations during the year you have stated in (a) (i) above. **(3mrks)**

(iii) Explain how each factor you have stated in (a) (ii) above could have brought about the changes in the fish populations. **(11mrks)**

(iii) Why did fish species C remain 0 after 1969? **(1mrk)**

b). Other than the factors stated in (a) (i) above, state other four that may affect the population of fish in the lake. **(4mrks)**

7 (a). What is meant by the term digestion? **(2mrk)**

b) Describe how the mammalian small intestine is adapted to its **(18mrks)**

8. Discuss the various evidences which show that evolution has taken place **(20mrks)**

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

TOP STUDENT KCSE PREDICTIONS

SERIES 1 TRIAL 6 BIOLOGY PAPER 1

Kenya Certificate of Secondary Exams

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

(a) *Write your name and Index number in the spaces provided.*

(b) *Answer ALL questions in the spaces provided.*

(c) *Candidates check the question paper to ascertain that all the papers are printed*

FOR EXAMINERS USE ONLY.

QUESTIONS	MAXIMUM SCORE	CANDIDATES SCORE
1 – 32	**80**	

1. What components of blood are absent in the tissue fluid **(2mks)**

2. (a) What is a cell. **(1mk)**

(b) Define the meaning of the following terms

(i) Entomology **(1mk)**

(ii) Genetics **(2mks)**

3. (a) Name the association between leguminous plant and rhizobium bacteria **(1mk)**

(b) (i) State the population estimation method of grasshoppers in your school Compound. **(1mk)**

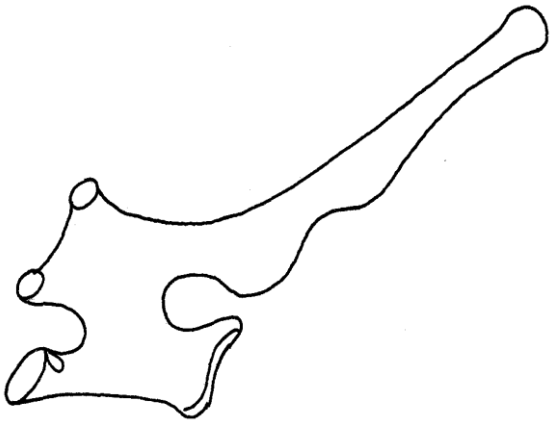
(ii) Suggest the name of the formula used to calculate population of the grasshoppers.

4. State the organelles that would be abundant in

(a) Palisade cell **(2mks)**

(b) Skeletal muscle cell **(2 mks)**

5. The diagram below represents a mammalian vertebra.



(a) Identify the vertebra represented above. **(1mk)**

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

6. State the functions of;

(a) Rough Endoplasmic Reticulum **(1mk)**

(b) Centrioles **(1mk)**

7. State any three theories that explain the mechanism of opening and closing of stomata. **(3mks)**

8. The following are characteristics of a certain animal dentition; large curved and sharply Pointed canines, small closely fitting incisors, narrow molars and premolars with cusps

(i) Identify the likely mode of feeding in this animal **(lmk)**

(ii) State three adaptations of the three types of teeth to the mode of feeding identified in **(i)** above **(3mks)**

9. A student visiting a game park observed that an adult elephant flapping its ears twice as much as its calf in order to cool its body when it is hot. Explain **(2mks)**

10. Name one function of,

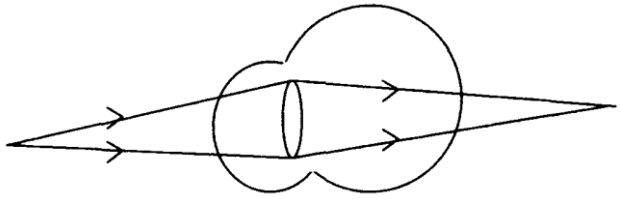
(a) Progesterone **(1mk)**

(b) Luteinizing hormone **(1mk)**

11.(a) Distinguish between the terms transpiration and Guttation **(2mks)**

(b) State the structures through which each of the process named in (a) above occurs **(2mks)**

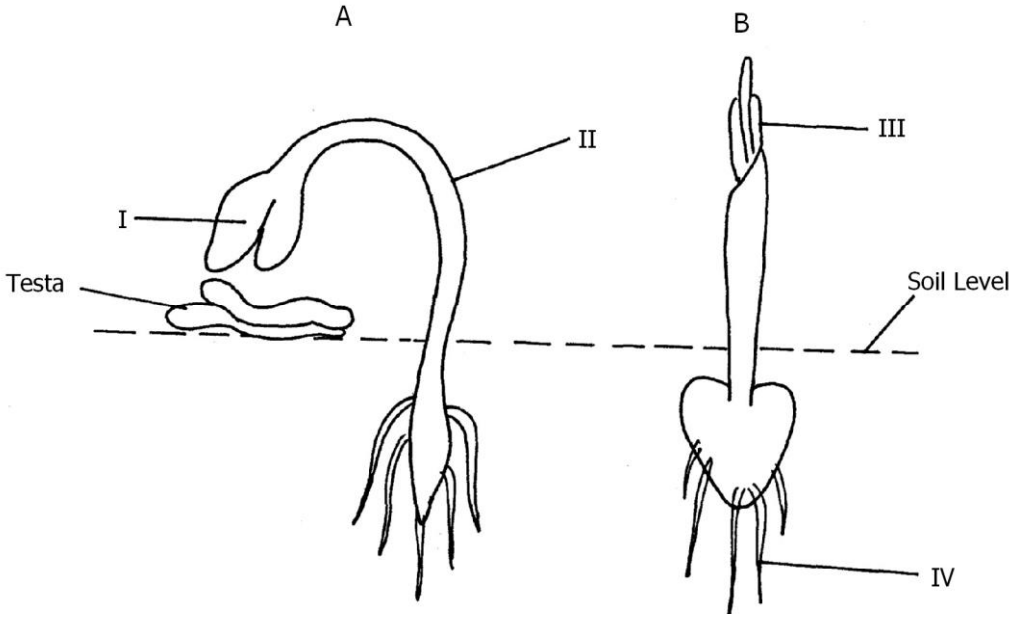
12. The diagram below shows the position of an image formed in a defective eye.



(a) Name the defect **(1mk)**

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

13. The diagram below represents a stage of growth in two different seedlings.



(a) Identify the type of germination exhibited B. **(1mk)**

(b) State the functions of part labeled **I** and **IV**. **(2mks)**

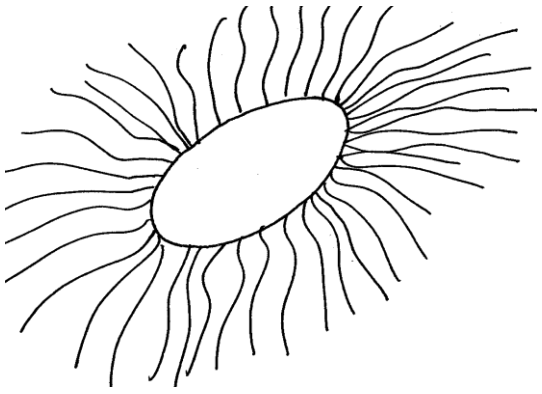
I

IV

14.(a) State the part of the brain that controls breathing movements in man **(1mk)**

(b) Explain how the aquatic plants are adapted to gaseous exchange **(4mks)**

15. The diagram below shows a seed of a certain plant.



(a) Name the likely agent of dispersal. **(1mk)**

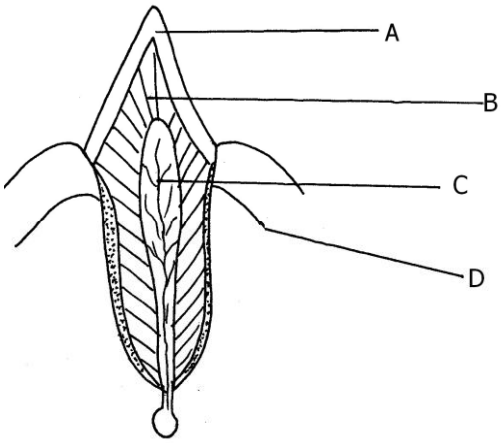
(b) Give a reason for your answer. **(1mk)**

16. (a) Distinguish between taxon and taxonomy **(2mks)**

(b) Name two classes of the phylum Arthropoda that have cephalothorax **(2mks)**

17.(a) Name the source of hydrochloric acid in the mammalian stomach. **(1mk)**

(b) The diagram below represents internal structure of a mammalian tooth.



(c) Name part labeled **B** and **D** **(2mks)**

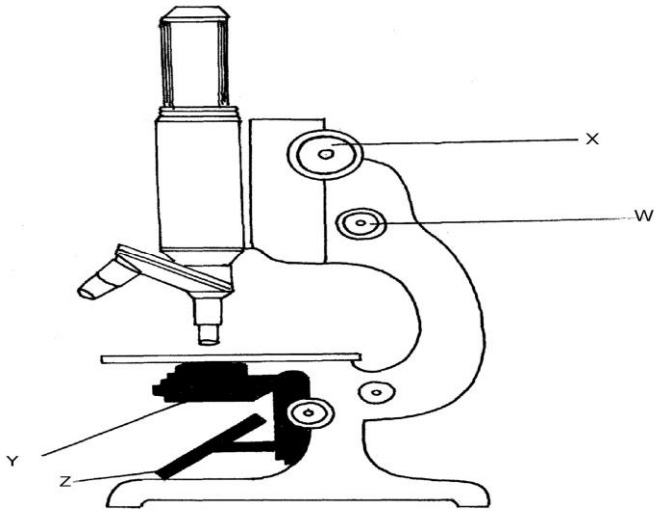
B -

D-

18. Distinguish between gene and chromosomal mutation. **(2mks)**

19. Differentiate between intracellular and extracellular enzymes. **(2mks)**

20. The diagram below represents a common laboratory equipment.



(i) Label the parts labeled **X** and **Y.** **(2mks)**

X -

Y-

(ii) Using arrows show how the object is illuminated. **(2mks)**

21. What is the main functions of vascular bundles. **(2mks)**

22. State the stage in meiosis where the following take place

(a) Disappearing of nucleolus **(1mk)**

(b) Formation of new spindle fibres **(1mk)**

(c) Formation of separate cells each with haploid number of chromosomes **(1mk)**

23. Explain the following genetic terms

(a) Turner's syndrome **(2mks)**

(b) Deletion **(2mks)**

(c) Name one sex-linked trait carried in they chromosome **(1mk)**

24. (a) What is meant by organic evolution (**1mk)**

(b) State three limitations in use of fossil records in retracting the evolutionary history of all modern day organisms **(3mks)**

25. Differentiate between monoecious and dioecious plants **(2mks)**

26. State three advantages of metamorphosis to the life of insects **(2mks)**

27. State the function of the following apparatus

(a) a pooter **(1mk)**

(b) a pit fall trap (**1mk).**

28.(a) Distinguish between Natural and acquired immunity **(1mk)**

(b) (i) Define the term Allergy **(1mk)**

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

TOP STUDENT KCSE PREDICTIONS

SERIES 1 TRIAL 6 BIOLOGY PAPER 2

Kenya Certificate of Secondary Exams

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

1. *Answer ALL questions in section A in the spaces provided.*
2. *In section B answer question 6 (compulsory) and either question 7 or 8 on the foolscap provided.*
3. *Candidates will be penalized for not following instructions in this paper carefully.*

4 All workings must be clearly shown where necessary.

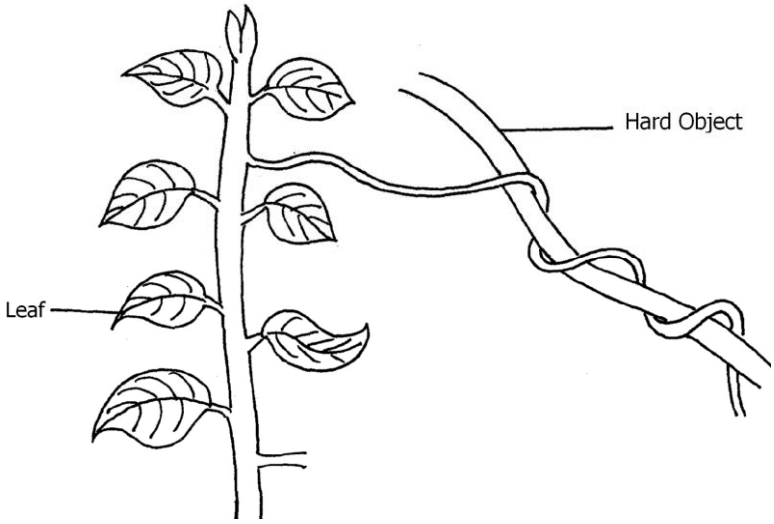
FOR EXAMINERS USE ONLY.

SECTION	QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1 2 3 4 5	08 08 08 08 08	
B	6 7 8		
TOTAL		80	

SECTION A (40 MARKS)

Answer all questions in this section

1. The figure below illustrate a response in plants.



(a) State the type of response illustrated **(1mk)**

(b) Explain how the response occurs. **(4mks)**

(c) State ***two*** importance of phototactic response in termites. **(2mks)**

(d) State hormone used in agriculture that breaks breaking seed dormancy. **(1mk)**

2. (a) (i) Define sex linkage. **(1mk)**

(ii) In a marriage of Jane and Otieno who are both normal for hemophiliac condition, gave birth to four children Susan, Grace, Tom and Peter. Tom the second born child was hemophilic. Later in life Tom married Alice who was normal. Their first born child was hemophiliac. Let H represent gene for normal condition.

(b) (i) What was the genotype of Alice. **(1mk)**

(ii) Work out the phenotypic ratio of F2. **(5mks)**

(c) How does the police force use knowledge on genetics. **(1mk)**

(d) What is the name given to points of contact in a pair of homologous chromosomes. **(1mk)**

3. A student observed feeding relationship while on a tour in a coastal Island.

-Eagles feed on small fish.

-Small fish feed on sea grass

-Insect larvae and molluscs feed on sea grass.

Insect larvae fed on by small fish, while crabs feed on insect larvae and molluscs.

(a) From the above information , construct a food web. **(3mks)**

(b) In which trophic level is small fish found. (**1mk)**

(c) Extract a food chain where the Eagle is a tertiary consumer. **(1mk)**

(d) Suppose all the crabs were poisoned, what would be the immediate effect in the ecosystem. Give a reason. **(1mk)**

(e) Give a reason why pyramid of biomass is a better representation of energy flow in an eco system than pyramid of numbers. **(1mk)**

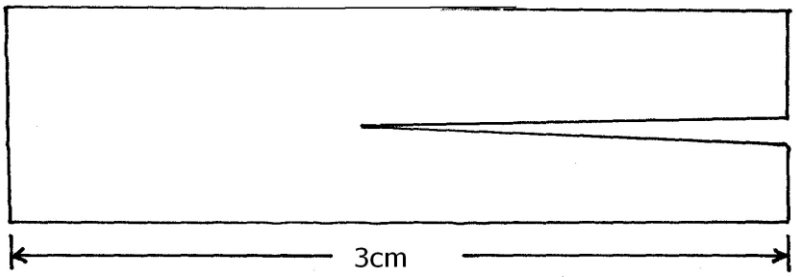
4. A student wanted to observe human red blood cells under a light microscope. He put l0ml of solution X,Y and Z in three boiling test tubes. The solutions were of different concentration .In each of the test tubes he put three drops of blood sample. The experiment was left to stand for 30 minutes. He placed one drop of solution X on glass slide and observed under the microscope.The same procedure was repeated for solutions Y and Z. He made the following observation.

Solution	**Observation**
X	Normal Cells
Y	Wrinkled Cells
Z	No cells observed

a) What was the physiological process observed. **(1mk)**

b) Explain why red blood cells observed in solution Y were wrinkled. **(3mks)**

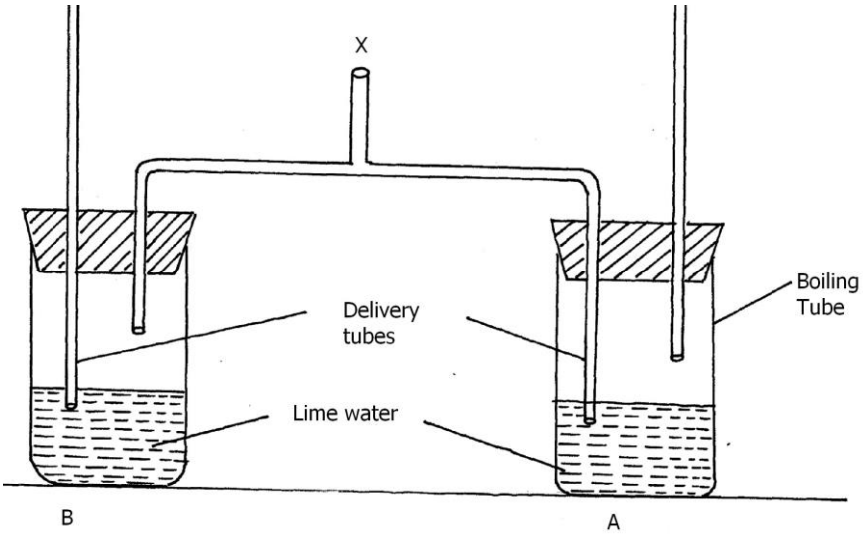
c) A 3cm long piece of kale (sukuma wiki) stem was cut halfway along its length as shown below.



(i) If the piece was placed in solution Z for 30 minutes, its shape changed . Using a pencil draw a diagram in the space provided to show the expected change. **(1mk)**

(ii) Explain the results obtained in **C(i)** above. **(3mks)**

5. An experiment was set up as shown below.



(a) A student blew air in and out through point X. Using arrows indicate on the diagram how air gets in and out of the set up. **(2mks)**

(b) **(i)** In which of the test tube would lime water turn milky first. **(1mk)**

(ii) Give a reason**.** **(1mk**

(iii) What is the effect of lactic acid in the thigh muscles of an athlete after a short fast race**.** **(2mks)**

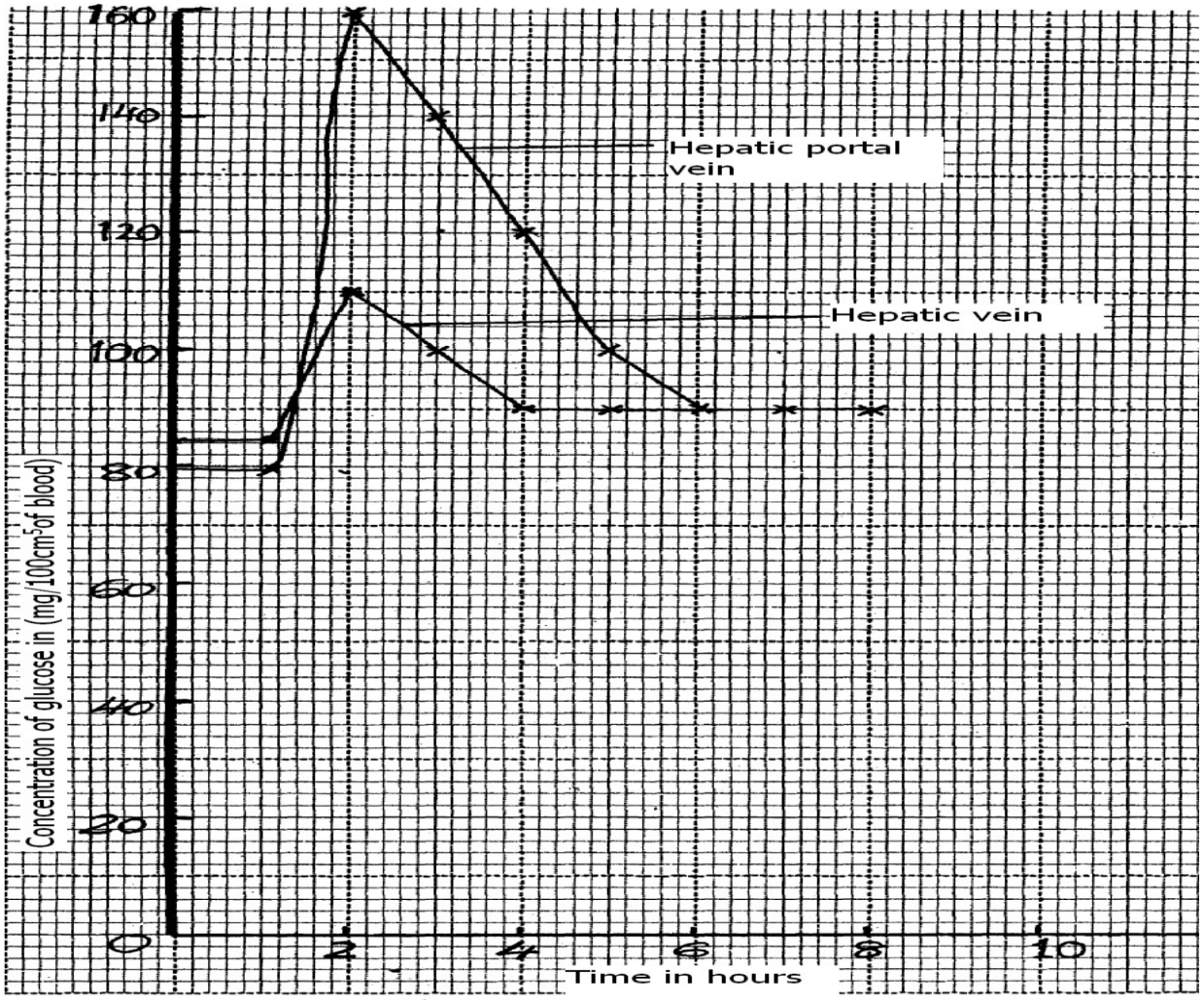
(c) Identify the type of muscle in human being where formation and effect of lactic acid is not felt. **(1mk)**

(d) What is the biological significance of boiling milk /ultra heat treated milk. **(1mk)**

SECTION B

COMPULSORY QUESTIONS.

6. A man was starved for 24hours.He was then served with a balanced diet after which the concentration of glucose in the hepatic and hepatic portal veins were determined at interval of 1 hour for the next 8 hours after the meal.The results were as shown in the graph below.



(a) From the graph state the normal concentration of glucose in man. **(1mk)**

(b) Determine the concentration of glucose after 2 ½ hrs. **(2mks)**

(c) Calculate the rate of glucose between 1 - 2 hours in hepatic portal vein. **(2mks)**

(d) Account for the blood sugar level in hepatic portal vein and hepatic vein between;

(i) 0- 1hour **(4mks)**

(ii) 2 - 4 hours. **(6mks)**

(a) A patient was found to produce urine that tasted sweet. Name the disease he was likely to be suffering from. **(1mk)**

(b) How would you test for the disease in your school laboratory. **(3mks)**

(c) What advice would you give to a patient whose blood contains abnormal high levels of urea. **(1mk)**

ANSWER EITHER QUESTION 7 OR 8 IN THE SPACES PROVIDED AFTER THE

QUESTIONS.

7. Describe how human skin is adapted to its function. **(20mks)**

8. **(a)**Describe the adaptation of floating water lily leaf to its photosynthetic function. **(10mks)**

(b) Describe the activities that take place in the chloroplast of growing plants.

(10mks)

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

TOP STUDENT KCSE PREDICTIONS

SERIES 1 TRIAL 7 BIOLOGY PAPER 1

Kenya Certificate of Secondary Exams

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

- The Paper consists of thirty three (33) Questions
- Write your name and index number in the spaces provided above
- Sign and write the date of examination in the spaces provided above
- Answer ALL the questions in this paper in the spaces provided.

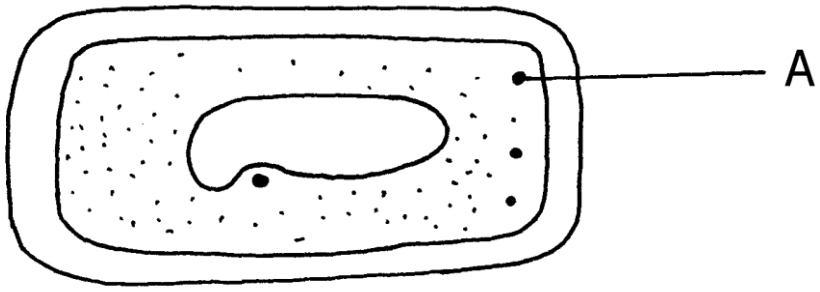
FOR EXAMINERS USE ONLY

QUESTION	Max Score	Candidate Score
1 – 33	80	

1.a) Name the antigens that determines human blood groups. **(2mks)**

b) State the adaptation of the red blood cells that make them move in blood capillaries**.** **(1mk)**

2. The figure below is a diagram of a cell as seen under the light microscope (**3mks)**



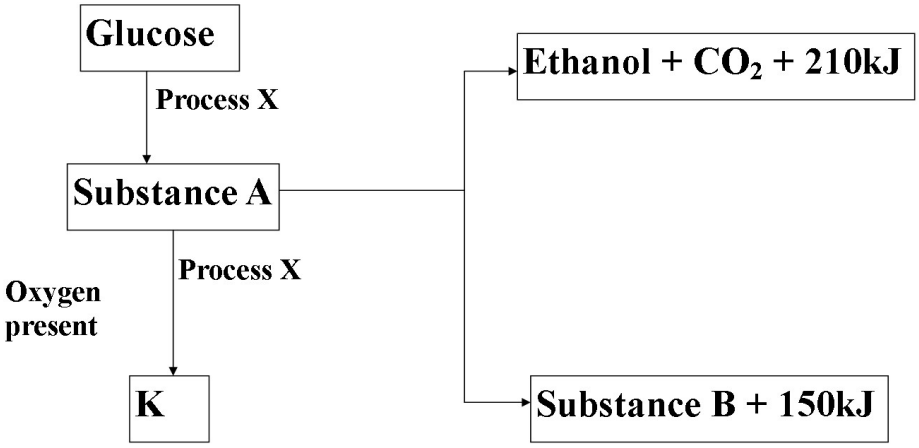
State <u>three</u> structures that show that these is a plant cell. **(3mks)**

3. Why is it more advantageous to breath through the nose than through the mouth. **(3mks)**

4. State ***<u>three</u>*** characteristics of members of Bryophyta. **(3mks)**

5. State ***<u>three</u>*** characteristics of a population **(3mks)**

6. The diagram below represents a simple respiratory pathway in cells **(2mks)**

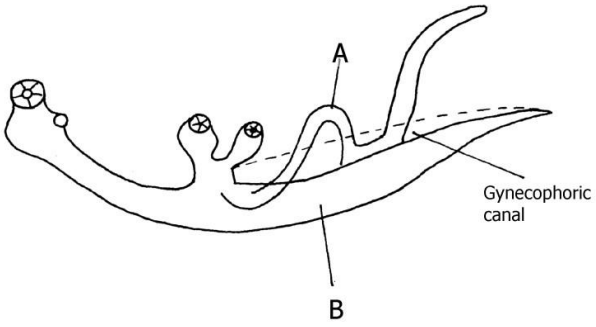


a. Name the process marked **X** and **Y** **(2mks)**

b. Name substances represented by **K**. **(1mk)**

c. State the name of substance **B.** **(1mk)**

7. The diagram below shows two organisms of the same species **(2mks)**



a. State the sex of organism **A** and **B.** **(2mks)**

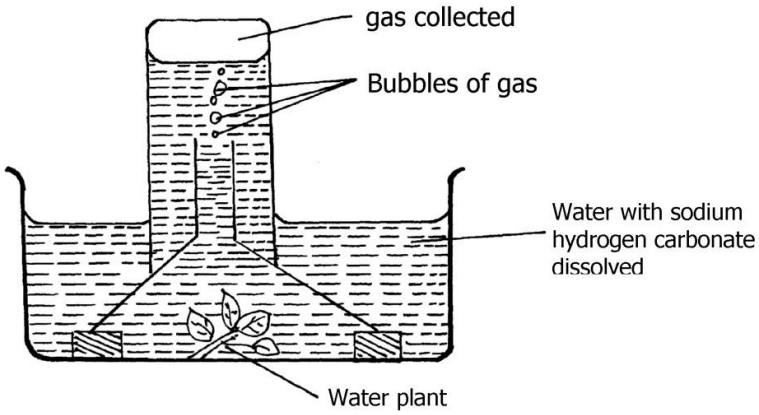
b. Name the disease caused by the above organism. **(1mk)**

8. Identify the physiolocal process involved in the following

a. Feeding in venus fly trap(insectivorous plant) **(1mk)**

b. Absorption of mineral salts by plant roots. **(1mk)**

9. An experiment on photosynthesis was set up as shown below **(4mks)**



a. What was the aim of this experiment. **(1mk)**

b. What gas is produced during this experiment. **(1mk)**

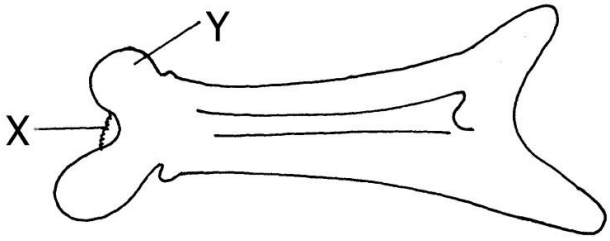
c. Why was sodium hydrogen carbonate added to water during this experiment. **(1mk)**

10. Distinguish between the following

a. Habitat and ecological niche. **(2mks)**

b. Intraspecific and interspecific competition . **(2mks)**

11. The diagram below represents a mammalian bone. **(1mk)**

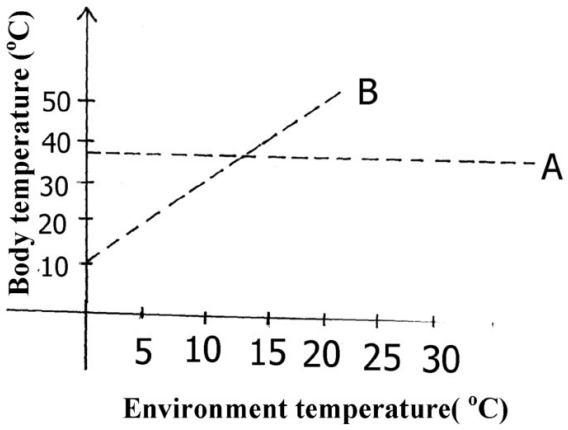


i) Name the bone **(1mk)**

ii) Identify the part labelled X **(1mk)**

iii) Name the bone that articulates with the part labelled Y (**1mk)**

12. Body temperature of two animals A and B were taken over the increase in environmental temperature. The results are shown in the diagram below.



a. What name is used to describe group of animals represented by

A **(1mk)**

B. **(1mk)**

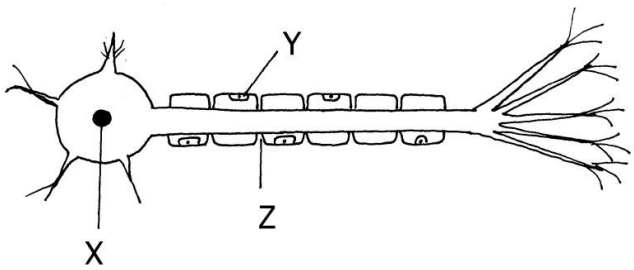
b. State ***two*** advantages of the group of animals represent by A over that of **B**. **(2mks)**

13. Briefly explain how the following affect the rate of transpiration **(2mks)**

i)Sunken stomata **(2mks)**

ii) Hairy leaves **(2mks)**

14. The diagram below shows the structure of a neurone



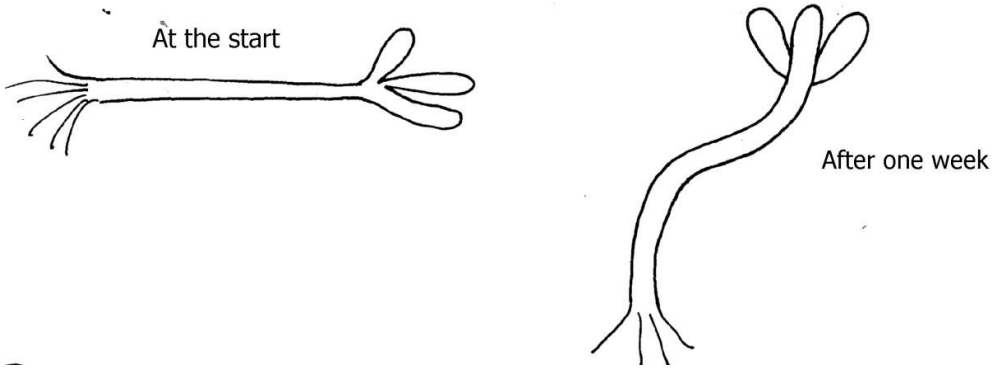
i) **a)** Identify the type of neurone drawn above (1mk)

b) Name the parts labelled **X** and **Y**

X

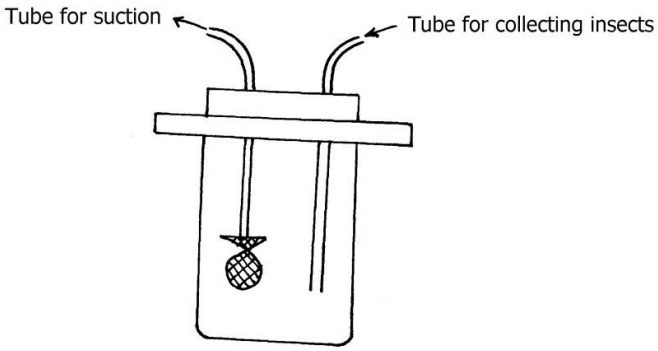
Y

15. A form four girl uprooted a young plant and laid it horizontally on the ground. After one week it was observed that the shoot of the same plant had bend upwards while theroot downwards as shown below.



Account for the observations made. **(3mks)**

16. The diagram below shows on apparatus used in collection of specimen



a) Identify the apparatus **(1mk)**

b) State its use **(1mk)**

17. Give a reason why staining is necessary when preparing specimen for observation under a microscope. **(1mk)**

18. The scientific name for a domestic cat is ***felis catus***. Outline the rules that were never followed in writing the name **(3mks)**

19. An organelle magnified 6000 times by an electrons microscope, measured 3mm in diameter. Calculate its real diameter in micro metres. Show your working **(2mks)**

20. What happens when a young herbaceous plant is well watered with strong salt solution**.** **(2mks)**

21 Name the cell organelles that would be found in abundance in

a) Skeletal muscus **(1mk)**

b) Palisade cells **(1mk)**

22. State one role of the following elements in the human body. **(1mk)**

a) Iron

(1mk)

b) Chlorine

(1mk)

23. **a)** What is mean by the term assimilation.

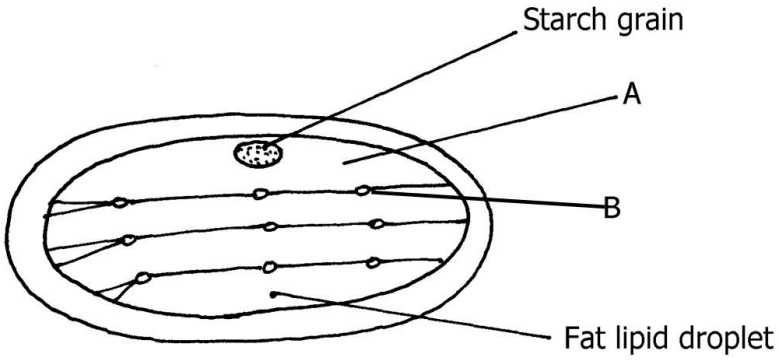
(1mk)

b) State ***two*** ways in which end products of lipids digestion are assimilated.

(2mks)

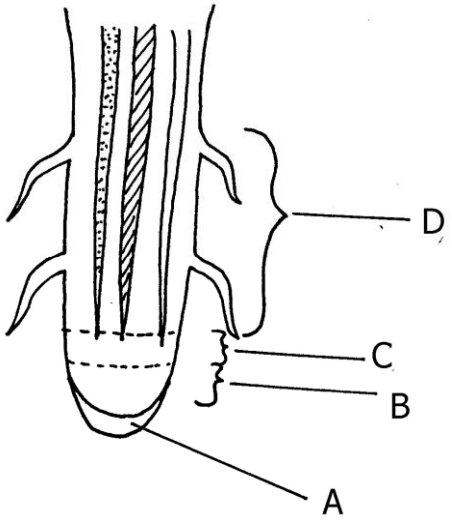
24. Enzyme + substrate $\rightleftharpoons$ enzyme + products from the above equation name ***two*** properties of enzymes exhibited in the equation. **(2mks)**

25. Study the diagram below and answer the questions that follow **(2mks)**



What process takes places in A and B. **(2mks)**

26. The diagram below represents a section of the dicot root apex. **(2mks)**



a) State the role of the part marked A

(1mk)

b) State ***three*** characteristics of the cells found in region B.

(3mks)

27. Give ***two*** adaptations of spiracles to their functions.

(2mks)

28. Differentiate between lactic acid fermentation and alcoholic fermentation.

(2mks)

29. State ***two*** importance of the placenta during pregnancy

(2mks)

30. State ***one*** function of water in a germinating seed.

(1mk)

31. Explain the following terms

a) Test cross

(1mk)

b) Phenotype **(1mk)**

32. Haemophilia is a sex – linked disorder caused by a recessive gene located on the X – chromosome. Give the genotype of a make haemophiliac individual.

(1mk)

33. Distinguish between divergent and convergent evolution. **(2mks)**

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

TOP STUDENT KCSE PREDICTIONS

SERIES 1 TRIAL 7 BIOLOGY PAPER 2

Kenya Certificate of Secondary Exams

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

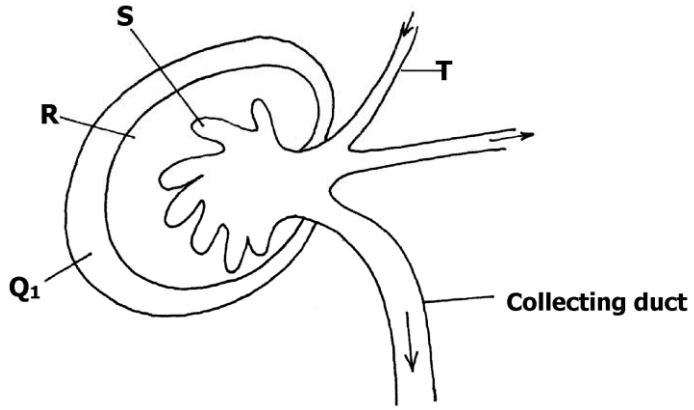
- This Paper consists 2 sections A and B.
- Answer all questions in section A in the spaces provided
- In section B, answer questions 6 (compulsory) and either questions 7 or 8 in the spaces after questions 8..

FOR EXAMINERS 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 SCORE	**80**	

SECTION A 40 MARKS

1. The diagram below is a longitudinal section of an organ in mammals



a) Name the organ **(1mk)**

b) Identify the parts R and S **(2mk**

c) **i)** State ***<u>two</u>*** differences in the structure above found in the deserted- rat and fish **(3mks)**

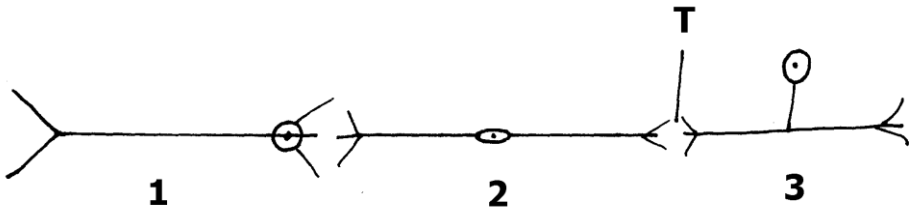
ii) Account for the difference stated above. **(2mks)**

d) Name the gland associated with the secretion of aldorsterone hormone**.** **(1mk)**

2. **a)** What is the economic importance of anaerobic respiration in industry. **(3mks)**

b) Explain what happens in the two phases of aerobic respiration. **(5mks)**

3. The diagram below shows three different types of neurons along a reflex arc.



a) Identify the Neuron labeled 1,2 and 3. **(3mks)**

b) Using arrows show the direction of impulse transmission on the diagram. **(1mk)**

c) Name the part where the cell body of neurons 1 and 2 are located**.(2mks)**

d) Describe the transmission of impulses across the part labeled T.

4. In an experiment, a variety of garden peas have a smooth seed coat was crossed with a variety with a wrinkled seed coat. All the seeds obtained in the F_1, had a smooth seed coat The F_1 generation was selfed. The total number of F_2 generation was 7324.

a) Using appropriate letter symbols in a punnet square, work out the genotypes of the F1 generation. **(4mks)**

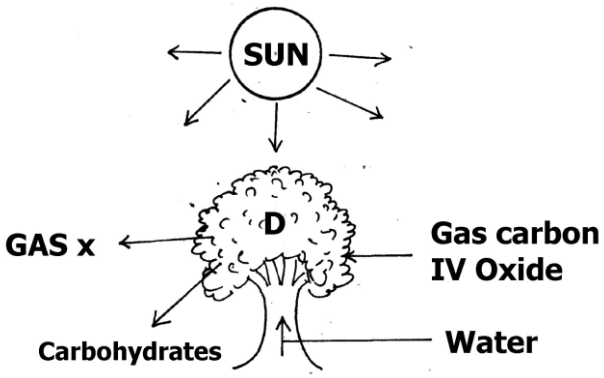
b) From the information above, work out the following for the F_2 generation

(i) Genotypic ratio **(2mks)**

(ii) Phenotypic ratio **(1mk)**

(iii) Wrinkled number **(1mk)**

5. The diagram below illustrate the first stage in the energy flow in the ecosystem



a) Identify (i) organelles responsible for activity in D.

(i) in **D** **(1mk)**

(ii) Gas **X** **(1mk)**

b) Suggest the roles played by each of the following in the process illustrated above.

(i) Light energy **(1mk)**

(ii) Water **(1mk)**

iii) Carbon (II) oxide **(1mk)**

c) Give three ways in which the carbohydrates produced in the organelles at D is utilized in the plants**.** **(3mks)**

SECTION B: 40 MARKS

6. The following data are results from an observation and measurement of daily growth in an organism over a period of 24 days of its development

a) Using a suitable scale draw graphs of width of head and length of femur against time on the same axis. **(8mks)**

DAY	**WIDTH OF HEAD**	**LENGHT**
	Mm	**Femur (mm)**
1	3.0	7.0
2	3.5	7.5
3	4.0	8.0
4	4.0	8.0
5	4.0	8.0
6	4.0	9.2
7	4.0	10.5
8	4.0	12.0
9	4.7	12.0
10	5.0	12.0
11	5.0	12.0
12	5.0	12.0
13	5.0	12.0
14	5.0	12.0
15	5.0	13.3
16	5.0	14.8
17	5.7	16.4
18	6.4	18.0
19	7.0	18.0
20	7.6	18.0
21	7.6	18.0
22	7.6	18.0

23	7.6	18.0
24.	7.6	18.0

b) **i)** Name the growth pattern represented by the graph. **(1mk)**

ii) With reference to your graph, identify the phylum to which the organism belongs. Give reasons for your answer. **(2mks)**

c) Account for the length of hind femur between

(i) day 3 and day 7 **(2mks)**

(ii) day 7 and day 10 **(2mks)**

d) State ***two*** hormones involved in the growth pattern represented by the graphs . **(2mks)**

e) State ***two*** advantages of metamorphosis in organisms. **(2mks)**

7. Explain how the various activities of man have caused air pollution. **(20mks)**

8. **a)** What are enzymes? **(2mk)**

b) State the properties of enzymes **(6mks)**

c) Discuss the factors that affect the rate of enzyme – catalysed reactions **(12mks)**

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

TOP STUDENT KCSE PREDICTIONS

SERIES 1 TRIAL 8 BIOLOGY PAPER 1

Kenya Certificate of Secondary Exams

TIME: 2 HOURS

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.*

For Examiner's Use Only

Question	Maximum Score	Candidate's Score
1-27	80	

1. State ***two*** characteristics of living organisms that are specific to plants. **(2marks)**

2. State **one** use for each of the following apparatus in the study of living organisms.

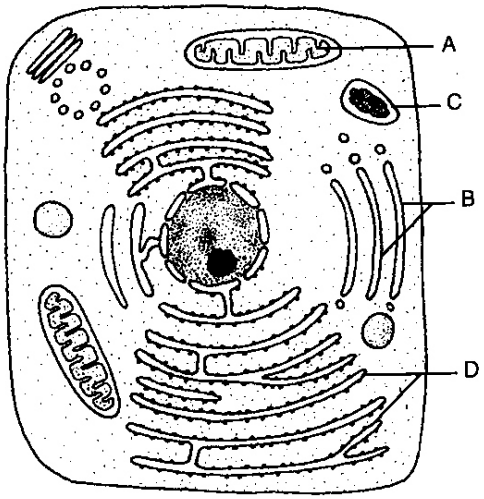
a) Pooter. **(1mark)**

b) Bait trap. **(1mark)**

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

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

4. The diagram below represents a cell as seen under an electron microscope.



a) Identify the parts labeled **A** and **D**. **(2marks)**

i) **A**

ii) **D**

b) State the function of the structures found on the part labeled **D.** **(1marks)**

5. **a)** Using a microscope, a student counted 55 cells across a field of view whose diameter was 6000µm. Calculate the average length of the cells. **Show your working. (2marks)**

b) State the function of the following parts of a light microscope

i) Fine adjustment knob. **(1mark)**

ii) Condenser . **(1mark)**

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

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

7. What is the importance of the following in an ecosystem? **(2marks)**

a) Decomposers

b) Predation

8. **(a)** State ***two*** functions of bile juice in the digestion of food. **(2marks)**

(**b)** How does substrate concentration affect the rate of enzyme action? **(1mark)**

9. Name the features that increase the surface area of small intestines. **(2marks)**

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

11.(a) Define the following terms. **(2marks)**

i. Population

ii. Community

(b) Name a method that could be used to estimate the population size of the following organisms.

i. Fish in a pond. **(1mark)**

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

12.(a) What is meant by the term allele? **(1mark)**

(b) Explain how the following occur during gene mutation.

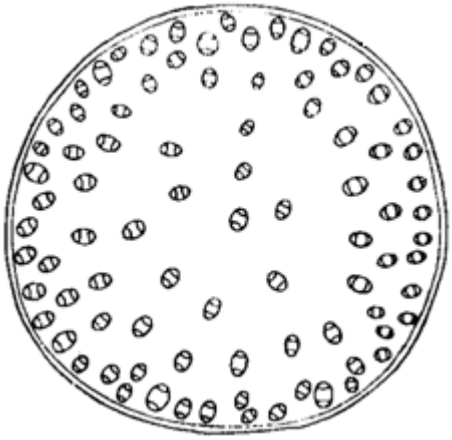
(i) Deletion. (**1mark)**

(ii) Inversion. **(1mark)**

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

13. Explain what happens when there is oxygen debt in human muscles. **(2marks)**

14. The diagram below shows a transverse section of a plant organ.



a) Name the class to which the plant organ was obtained**.** **(1mark)**

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

15. Giving a reason in each case, name the class to which each of the following organisms belong: **(4marks)**

Pea plant-

Reason –

Bat-

Reason-

16.(a) Name the causative agents of the following diseases in humans. **(2marks)**

Typhoid

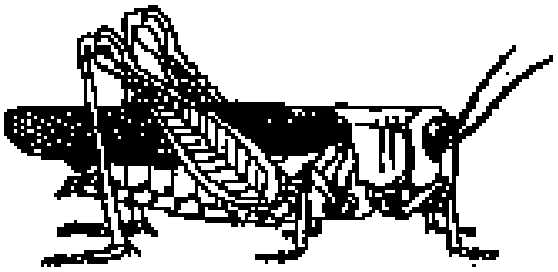
Amoebic dysentery

(b) Name the disease in humans caused by *Plasmodium falciparum.* **(1mark)**

17. State ***three*** differences between Chilopoda and Diplopoda**.** **(3marks)**

18. What are the limitations of fossil records as evidence of organic evolution**?** **(1mark)**

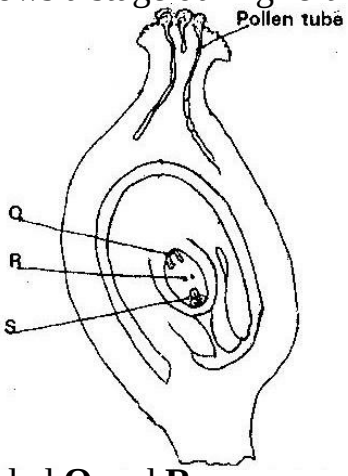
19. The diagram below represents a member of the kingdom Animalia.



i) Name the phylum to which the organism belongs. **(1mark)**

ii) Using observable features in the diagram, give three reasons for the answer in (i) above. **(3marks)**

20. The diagram below shows a stage during fertilization in plants.



a) Name the parts labeled **Q** and **R.** **(2marks)**

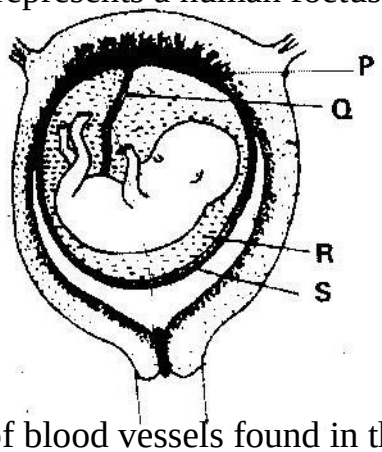
Q

R

b) State the function of the pollen tube **(1mark)**

c) On the diagram, label the micropyle**.** **(1mark)**

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



a) Name the types of blood vessels found in the structure labeled **Q.** **(2marks)**

b) Name ***two*** features that enable the structure labeled **P** carry out its function.**(2marks)**

22. Name the type of skeleton that makes up each of the following animals. **(3marks)**

a) Cockroach

b) Bird

c) Earthworm

23. (a) Highlight ***two*** survival values of tropic response. **(2marks)**

(b) What is a klinostat? **(1mark)**

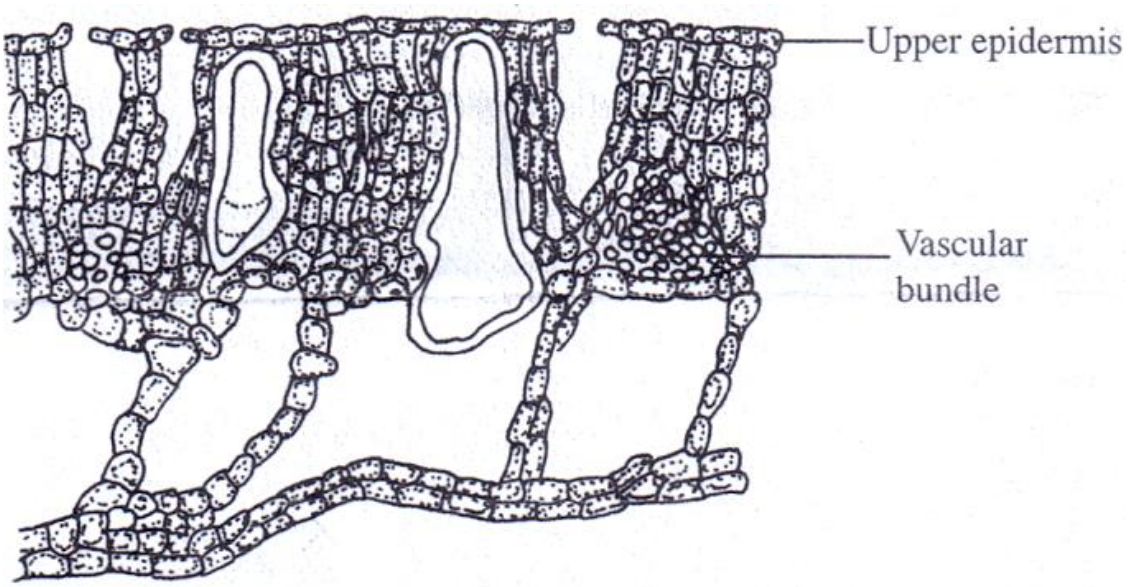
24. Name:-

a) The pressure sensitive swellings at the base of some leaves and petals which through loss or gain of turgidity bring about nastic movements. **(1mark)**

b) The structure in cockroach used for detecting stimuli**.** **(1mark)**

c) The growth movement of part of plants in response to a unidirectional external stimulus**.** **(1mark)**

25. The diagram below shows a transverse section of a leaf. Study it carefully then answer the questions that follow.



a) Name the habitat of the plant from which the leaf was obtained. **(1mark)**

b) Give ***<u>two</u>*** reasons for your answer in (a) above. **(2marks)**

26.(a) Name the gaseous exchange surface in insects. **(1mark)**

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

27. Most carbon (IV) oxide is transported from tissues to the lungs within the red blood cells and not in the blood plasma. Give two advantages of this mode of transport. **(2marks)**

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

TOP STUDENT KCSE PREDICTIONS

SERIES 1 TRIAL 8 BIOLOGY PAPER 2

Kenya Certificate of Secondary Exams

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

- *Write your name, Index Number in the spaces provided above*
- *Write the date of examination in the space provided above*
- *Answer ALL the questions in section A in the spaces provided below each question in the question paper*
- *In section B, answer question 6(Compulsory) and either question 7 or 8*

FOR EXAMINER'S USE ONLY

Section	Question	Maximum Score	Candidate's Score
A			
B			
	TOTAL		

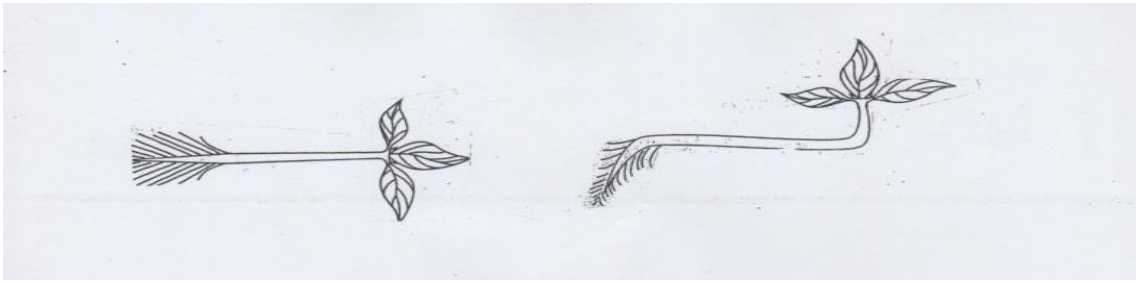
SECTION A:

1. **a)** Define the following terms

(i) Stimulus **(1 mark)**

(ii) Taxis **(1 mark)**

b) A student uprooted a seedling of Bryophylum and left it to lie on the ground. After a few days the seedling has assumed a growth curvature shown in the diagram below.



At the start of the experiment At the end of the experiment

(i) Account for the growth curvature observed in parts **A** and **B** **(4 marks)**

Part **A**

Part **B**

c) State ***two*** survival values of taxis to organisms **(2 marks)**

2. A cross between a black bull and a white cow produces a calf with black and white spots.

a) Work out the possible genotypes of a calf resulting from a cross between a black bull and a white cow. **(4 marks)**

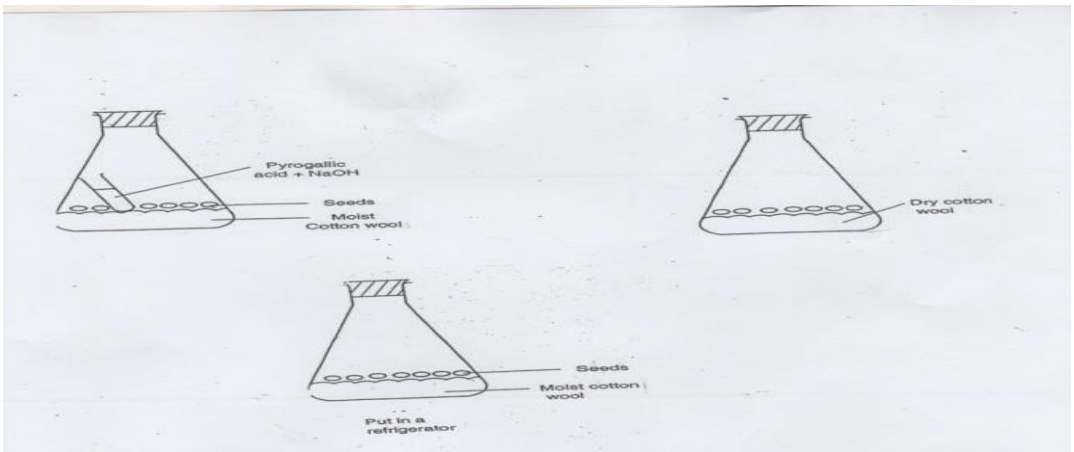
b) State the reason why the calf had black and white spots **(1 mark)**

c) What is meant by the term allele? **(1 mark)**

d) State ***two*** characteristics of an individual with Down's syndrome **(2 marks)**

3. An experiment was set up as shown below by a biology class.

A B



C

a) What is the role of pyrogallic acid in sodium hydroxide in flask A**(1 mark)**

b) What conditions were being investigated in flasks A, B and C? **(3 marks)**

A-

B-

C-

c) Suppose the dry cotton wool in flask B was replaced with a moist cotton and set-up left for five days, give and account for the observation made **(2 marks)**

d) State the inhibitory roles of gibberelic acid in plants **(2 marks)**

4. **a)** Distinguish the following terms as used in animal nutrition

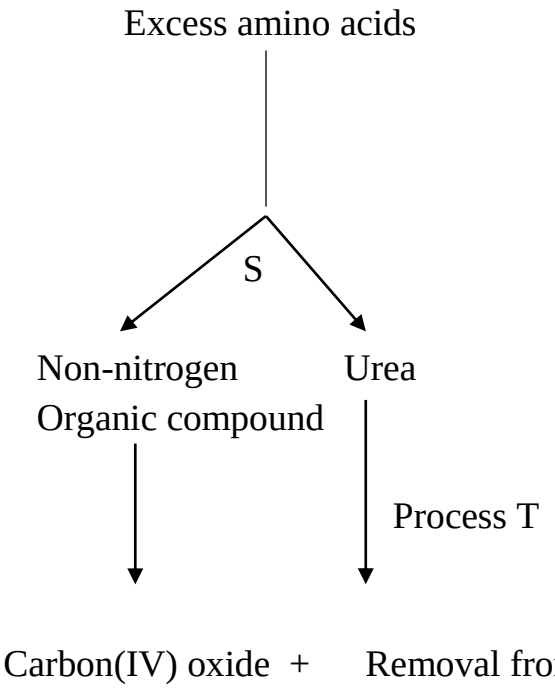
(i) Dentition and dental formula **(1 mark)**

(ii) Homodont and heterodont dentition **(1 mark)**

b) State ***<u>two</u>*** functions of the ileum **(2 marks)**

c) Explain how the chloroplast is adapted to its function **(4 marks)**

5. Proteins are present in a balanced diet. They are broken down into amino acids and excess cannot be stored in the body. Its metabolism is as shown below.



a) Describe how urea is transported to the site of removal from the body **(2 marks)**

b) Name the process Sand T, stating the organ in which each occurs**(4 marks)**

Process	Name	Organ
S		
T		

c) Give ***four*** uses of amino acids in the body **(2 marks)**

SECTION B

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

6. In an experiment, Tradescantia plants with purple leaves were kept in the dark for about 1 hour, strips of leaves approximately 5mm by 12mm from this plants were then cut and floated with lower epidermis on experimental solution in petri dishes. The dishes were then placed in light and temperature kept at 20°C. After 5 minutes a leaf strip was removed from each experimental solution, quickly blotted dry and the percentage number of open stomata was found after counting under the microscope. The procedure was repeated with other strips from the same experimental solutions at intervals of 10 minutes. The results are as shown in the table below.

Time in minute, floating on solution	5	15	25	35	45	55
% open stomata in KCl solution (150mm)	0	0	20	76	82	86
% open stomata in NaCl solution (150mm)	0	0	6	22	42	45

a) Plot graphs using the same axis and suitable scale for the percentage of open stomata against time for treatment in each of the solutions, potassium chloride and sodium chloride. **(7 marks)**

b) Why was it necessary to keep the plant in the dark for a period of time before the experiment? **(1 mark)**

c) Using the graphs you have plotted give possible explanations for the behaviour of the guard cells during this experiment **(6 marks)**

d) What would happen if the experiment was carried out in the dark **(1 mark)**

e) With respect to leaf structure only, state **five** ways in which plants living in arid areas minimize excessive water loss. **(5 marks)**

8. a) State **four** precautions to be observed when collecting specimens. **(4 marks)**

b) Explain how the various activities of man have caused soil pollution **(16 marks)**

9. a) State the various ways in which energy is utilized in living organisms **(6 marks)**

b) Describe the process of fertilization and implantation of the zygote in mammals **(14 mks)**

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

TOP STUDENT KCSE PREDICTIONS

SERIES 1 TRIAL 9 BIOLOGY PAPER 1

Kenya Certificate of Secondary Exams

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

1. Write your **Name**, **Index Number, Admission 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.

FOR EXAMINER'S USE ONLY:

Question	Maximum Score	Candidate's Score
1 – 30	**80**	

1. State the functions of each of the following organelles: **(2mks)**

a) Plasma membrane

b) Ribosome.

2. **(a)** State ***two*** ways by which leaves of plants are adapted to gaseous exchange. **(2mks)**

b)Name the structure from which the above process occurs. **(1mk)**

3. How do identical and fraternal twins arise?

i) Identical **(2mks)**

ii) Fraternal **(1mk)**

4. State three reasons why it is important for plants to lose water to the atmosphere. **(3mks)**

5. What is meant by destarching a leaf? **(1mk)**

6. State ***two*** ways in which sunlight increases the rate of transpiration. **(2mks)**

7. List ***two*** features of flowers that attract insect pollinators. **(2mks**)

8. State three activities in human digestive system that depend on respiration. **(3 mk**

9.In the table below, indicate the deficiency diseases caused by lack of given nutrients in man. **(2mks)**

Nutrient	**Deficiency disease**
Iron	
Vitamin A	

10(a) Give ***two*** ways in which red blood cells are adapted to carry out their functions. **(2mks)**

(b) Name chemical forms in which carbon IV oxide is transported in the human body. **(2mks)**

11. Name any ***two*** divisions of the kingdom plantae. **(2mks)**

12. (a) Name the hormone produced in human body when one takes in a large amount of water. **(1mk)**

(b) What disease results from the inadequate production of the hormone in 12(a) above? **(1mk)**

13.A cow in a paddock was found to be infected with ticks. State the trophic level occupied by the **(2mks)**

a)i) Cow

ii) Tick.

b)Give ***one*** disadvantage of using pesticide to eliminate the ticks. **(1mk)**

c)Write a food chain arising from the above feeding relationship **(1 mk)**

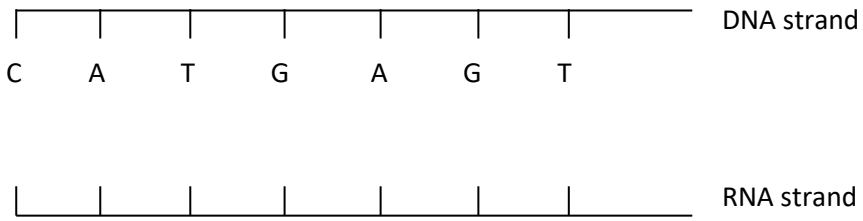
14.State ***two*** roles of water in germinating seeds? **(2mks)**

15(a) State ***two*** limitations of fossil records as an evidence for organic evolution theory**.** **(2mks)**

(b) State an idea that led to the formulation of Lamarck's theory of evolution.**(1mk)**

16. Explain what happens to red blood cells placed in distilled water for 20 minutes. **(3 mks)**

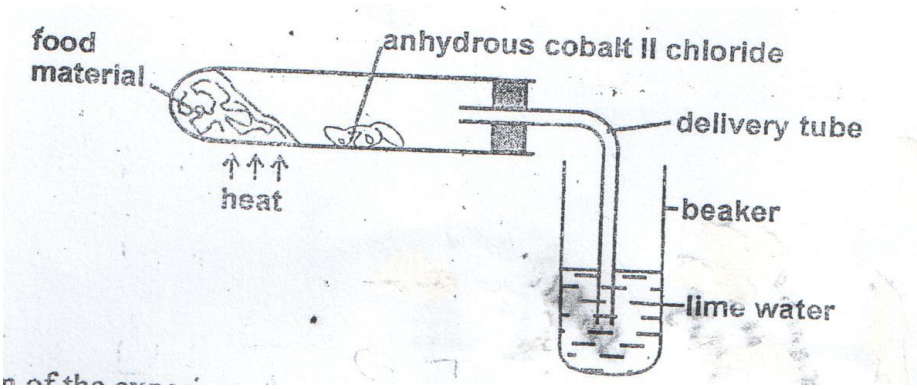
17(a) Write the base sequence of M RNA that would be coded from the DNA strand shown below. **(2mks)**



(b) How many nitrogenous bases code for a single amino acid? **(1mk)**

18.Why are animal cells put in isotonic solution when performing an experiment? **(2mks)**

19. Study the diagram below



a) Suggest the aim of the experiment. **(1mk)**

b) Account for the results observed at the end of the experiment**.** **(2mks)**

20. Explain why a camel has a longer nephron than a whale. **(3 mks)**

21. State role of the following bacteria in the nitrogen cycle. **(3mks)**

a) Nitrosomonas

b) Nitrobacter

c) Azotobacter

22. Explain the importance of each of the following during digestion in man.

a) Teeth**.** **(1mk)**

b) Saliva. **(1mk)**

23(a) Distinguish between prokaryotic and eukaryotic cells. **(2mks)**

b) Name one kingdom with:

i)Prokaryotic cells**.** **(1mk)**

ii) Eukaryotic cells **(1mk)**

24. What would blood gain on passing through each of the following organs:

i)The lungs. (**1mk)**

ii) Active muscles**.** **(1mk)**

25. How do sunken stomata lower the rate of transpiration? **(2 mks)**

26. State **two** adaptations of fruits dispersed by wind. **(2mks)**

27(a) Describe two ways how white blood cells fight against infection**.** **(2mks)**

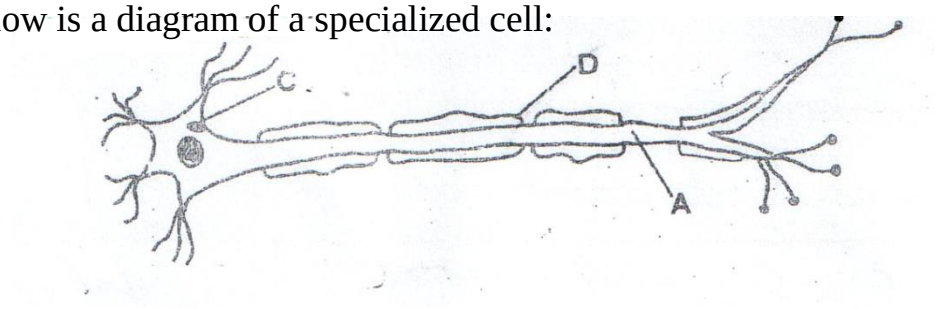
(b) State the function of blood platelets **(1mk)**

28. Calculate the diameter of the cells in micro-metre(µm) given that the diameter of the field of view is 3mm and that they are 10 cells across the field of view, the total magnification was x100. **(3mks)**

29.(a) Apart from AIDs, name ***one*** diseases of the reproductive system in man that is caused by viruses. **(1mk)**

(b) State ***one*** way by which HIV/AIDs is transmitted from mother to child. **(1mk)**

30 (a).Below is a diagram of a specialized cell:



i)Name parts **(2mks)**

A-

D.-

ii) What is the role of part **D?** **(1mk)**

b. State two roles of progesterone. (**3mks)**

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

TOP STUDENT KCSE PREDICTIONS

SERIES 1 TRIAL 9 BIOLOGY PAPER 2

Kenya Certificate of Secondary Exams

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

- Write your name, school and index number in the spaces provided above.
- Write the date of examination and sign in the spaces provided above.
- Answer **ALL** the questions in **section A** by filling in the spaces provided.
- In **section B**, answer **question 6 (compulsory question)** and any other **one question** from the remaining two questions. (i.e. 7 or 8)
- Candidates may be penalized for false information and even wrong spellings of technical terms.
- This paper consists of **10** printed pages.
- Candidates should check to ensure that all pages are printed as indicated and no questions are missing.

FOR OFFICIAL USE ONLY

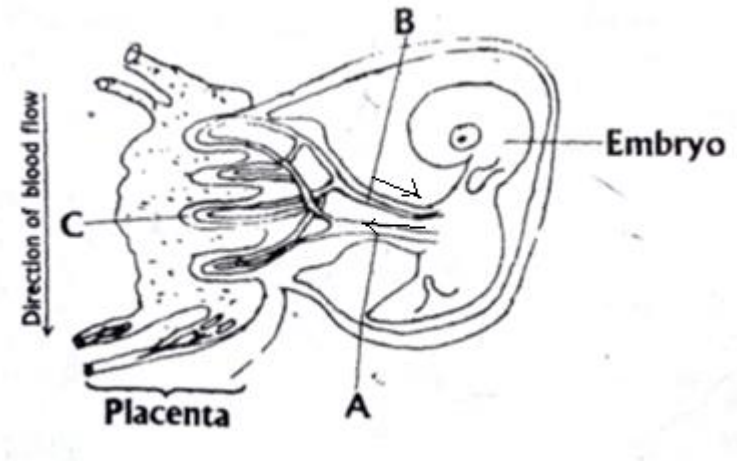
	Questions	Maximum score	Candidate's score
Section A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
Section B	6	20	
	7	20	
	8	20	
	Total Score	80	

1.A specimen of Drosophila has red eye and when crossed with a purple mutant all the F1 had red eyes.The offspring's were mated among themselves and the following proportions of flies were produced; 201 gad red eyes and 67 had purple eyes.Using R to represent the dominant gene and r to represents the recessive gene,answer the following questions.

i)By the help of diagrams shows how the ratio of 201:67 was arrived at ,in the F2generation. **(5mks)**

ii) Draw diagrams to show the genetic details of a cross between the heterozygous red eyed and a purple eyed individual form F2. **(3mks)**

2.The diagram below shows the relationship between blood supplies of the embryo, placenta and the uterus.Use it to answer the question that follow.



a) Name the part labeled A and C. **(2mks)**

b) State any two functions of placenta in mammals. **(2mks)**

c) .(i)What kind of flow does maternal and foetal capillaries exhibit at the placenta**.** **(1mk)**

(ii)Why is this kind of flow(c) (i) have an advantage. **(1mk)**

d) If the maternal and foetal blood circulatory system were to be directly connected at the placenta suggest what may happen. **(1mk)**

e) In lactating mammals if the pituitarygland isremoved, explain what happens. **(1mk)**

3.A student was given four test tubes A, B, C and D, each containing a different mixture among the following:

i) Starch +amylase + maltase+water

ii) Starch +Pepsin +Water

iii) Starch +Glucose +Water

iv) Cellulose +amylase+trypsin+Water

She placed the test tubes in an incubator at 30^0C until all possible reactions had taken place.She then took samples from each test tube and tested them separately for

starch,reducing sugar and protein.The results obtained are given in the following table.

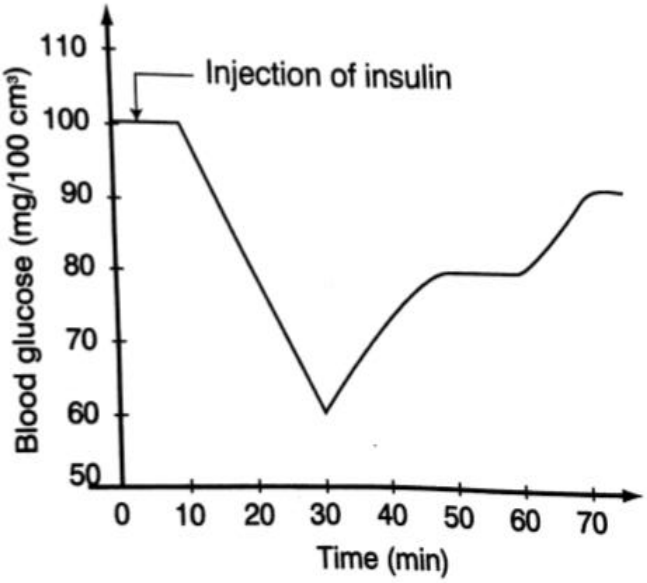
Tube	Starch	Reducing	Protein
A	Present	Present	Absent
B	Absent	Absent	Present
C	Present	Absent	Present
D	Absent	Present	Present

a) Name a reagent used to test for reducing sugar and state the appearance of a positive result. **(2mks)**

b) Identify the contents of each of the test tube A,B,C and D according to the results obtained. **(4mks)**

c) State the role of enzyme in respiration. **(2mks)**

4. The graph below shows the effect of injecting one unit of insulin into aperson .The concentration of glucose in the blood is measured at regular intervals



a) Why is insulin injected into blood stream directly instead of being taken orally. **(2mks)**

b) Explain the fall in blood glucose level. **(2mks)**

c) Name the mechanism that led to the increase in blood glucose level when it had been falling. **(1mk)**

d) Name the hormone responsible for the conversion of glycogen to glucose. **(1mk)**

e) State the effects of each of the following in human beings.

i)Too much glucose in the blood. **(1mk)**

ii) Very little glucose in the blood. **(1mk)**

5. The diagram below shows a stem of a passion fruit twining around a post.

a)What is the name given to the type of growth movement shown above? **(1mk)**

b) What is the biological importance of this growth? **(1mk)**

c.i)Account for the twining growth pattern. **(3mks)**

ii) Name three other types of growth responses exhibited by plants. **(3mks)**

SECTION B(40 MARKS)

Answer question 6 and either question 7 or 8

6.The formation of acid rain is a serious environmental concern.Sulphuric acid is present in acid rain and has adverse effects on both plants and animals.

a)Name two other acids (other than sulphuric acid)that can be found in acid rain. **(2mks)**

b)An experiment was carried out to investigate the effects of dilute sulphuric acid on the growth of plant seedlings.Batches of seedlings were grown in glass dishes on filter paper to which dilute sulphuric acid was added.The dishes were then incubated.The root and shoot lengths were measured after 65 hours.The results obtained are as shown in the table below.

Sulphuric acid Concentration (mol/dm^{-3})	Mean root Length(mm)	Mean shoot Length(mm)
0	55.5	25.2
$1x10^{-3}$	63.4	18.4
$3x10^{-3}$	6.5	9.5
$4x10^{-3}$	2.0	4.6
$6x10^{-3}$	1.8	0.8

$7x10^{-3}$	1.5	0.5
$8x10^{-3}$	1.3	0.3
$9x10^{-3}$	1.3	0.0
$10x10^{-3}$	1.0	0.0

Plot a graph of the mean root length and the mean shoot length against the sulphuric acid concentration on the same grid.**(provide a graph paper)** **(7mks)**

c) Describe the relationship between the concentration of sulphuric acid and the:

i)Growth of the shoots. **(2mks)**

ii)Growth of the roots. **(2mks)**

d) Estimate the mean root and mean shoot lengths when the concentration of sulphuric acid is $5x10^{-3}$. **(2mks)**

e)State ***two*** other effects of acid rain. **(2mks)**

f) State ***three*** ways of preventing acid rain. **(3mks)**

SECTION C

(Answer one question only)

7.(a) Describe the following terms:

(i) Secretion

(ii) Excretion

(iii) Egestion **(3 mks)**

b)Explain how the mammalian kidney is adapted to its functions. **(17 mks)**

8.Explain the role of hormones in the growth and development of plants**. (20mks)**

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

TOP STUDENT KCSE PREDICTIONS

SERIES 1 TRIAL 10 BIOLOGY PAPER 1

Kenya Certificate of Secondary Exams

TIME: 2 HOURS

INSTRUCTIONS

Answer **ALL** the questions in spaces provided.

SECTION A

1. A young scientist observed a bird laying her eggs in a nest and later the eggs hatched into chicks. Name three characteristics shown by the chicks that show a chick is a living thing but an egg is not **(3mks)**

2. Which organelles should be abundant in;

i) Skeletal muscle **(1mk)**

ii) Palisade tissue **(1mk)**

3. A form 1 student was preparing temporary slides in the laboratory, in the course of preparation he carried out the following processes;

i) Sectioning

ii) Fixation

iii) Staining

State the importance of the above processes **(3mks)**

4. Why are lysosomes many in phagocytic cells **(2mks)**

5. Differentiate between guttation and transpiration **(2mks)**

6. a) Give a reason why xylem vessel should be dead **(1mk)**

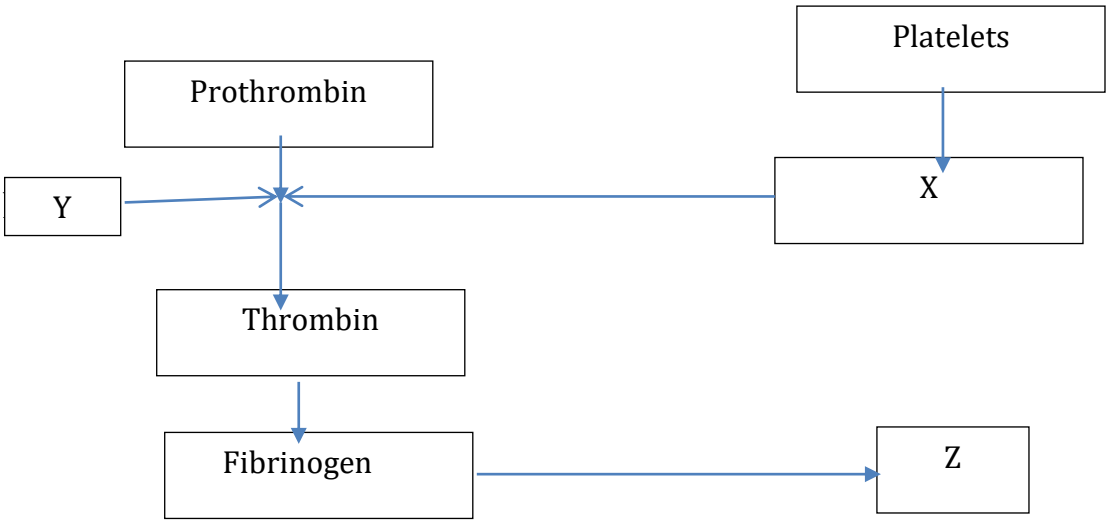
b) What is the role of lignin in the wall of the xylem vessel **(1mk)**

7. Name the disease of the blood characterized by,

a) Abnormally large number of white blood cells **(1mk)**

b) Cresent –shaped haemoglobin **(1mk)**

8. The chart below is a summary of blood clotting mechanism in a man.

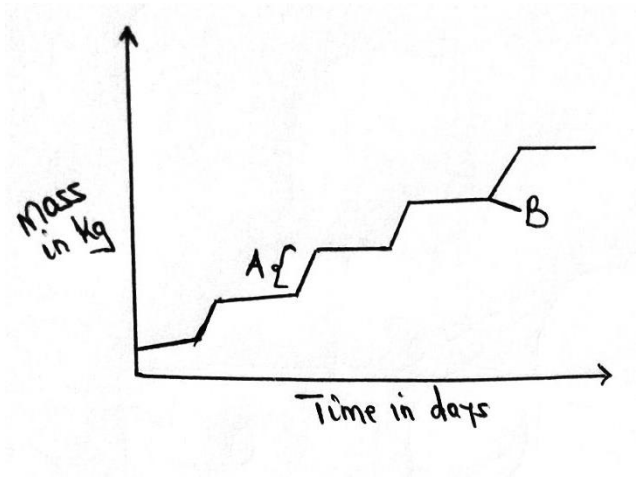


Name;

i) The metal ion represented by Y **(1mk)**

ii) The end product of the mechanism represented by Z **(1mk)**

9. The graph below represents the growth of animals in a certain phylum. Study it and answer the questions that follow.



a) Name the type of growth pattern shown on the graph **(1mk)**

b) Identify the process represented by letter B **(1mk)**

c) Name the hormone responsible for the process in (b) above **(1mk)**

10. Explain why a mule is infertile **(1mk)**

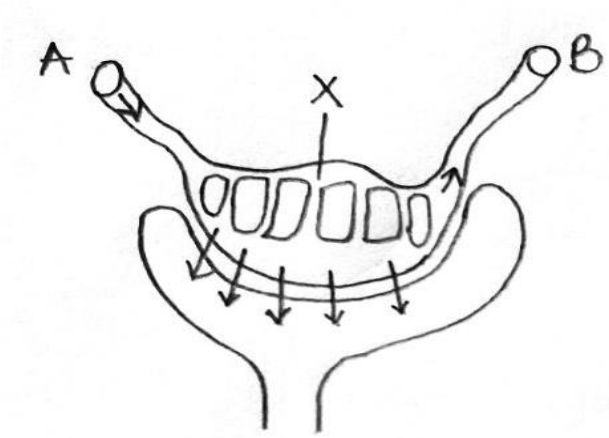
11. Phylum Arthropoda is the most successful of invertebrates. Explain two characteristics that make them most successful **(2mks)**

12. Name phylum whose members possess a notochord (**1mk)**

13.a) Define evolution and homologous structures **(2mks)**

b) State three limitations of using fossil records as an evidence that supports organic evolution **(3mks)**

14. The following is part of a kidney nephron



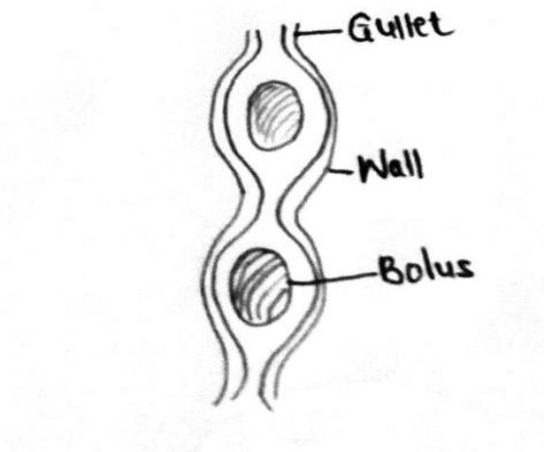
a) i)Name the process represented by the arrows **(1mk)**

ii) Name the conditions necessary for the process named in (a) (i) above to take place **(1mk)**

b) Identify with a reason vessel A **(1mk)**

c) Name any two blood components that are present in vessel (A) but are absent in vessel **B** **(2mks)**

15. The diagrammatic representation below illustrates one of the process that occurs in mammals during feeding. Carefully study it and answer the following questions



i) Identify the process **(1mk)**

ii) State two structural adaptations of gullet to its functions **(2mks)**

iii) Name one enzyme already present in the food bolus within the gullet in man **(1mk)**

b) State ***two*** functions of mucus secreted by the intestines **(2mks)**

16. Explain each of the following;

a) Variegated plants accumulates less food than non-variegated plants under similar conditions. **(2mks)**

b) Most leaves are thin with broad leaf surface **(2mks)**

17. State the economic importance of the following plant excretory products (3mks)

a) Papain
b) Caffein
c) Colchicine

18.a) State ***two*** processes which occurs during anaphase of mitosis **(2mks)**

b)What is the significance of first meiotic division **(1mk)**

c)State two ways in which HIV/AIDS is transmitted from mother to child **(2mks)**

19. State the function of the following during pregnancy **(3mks)**

a) Amnion

b) Amniotic fluid

c) Umblical cord

20. Name the process by which;

i) Producers convert sunlight energy into chemical energy **(1mk)**

ii) Chemical energy is converted into heat energy by consumers **(1mk)**

21. Students from Mpesa foundation academy wanted to investigate the population of crabs in their school pond. They caught 50 crabs, marked them with white paint on the cephalothorax and then released them back into the pond. After three days, they came back and caught 50 crabs of which 3 had the white mark.

a) Using the data above, calculate the population of crabs in the pond **(2mks)**

b) Suggest three assumptions the students made during this study **(3mks)**

22. State any two methods that can be used at home to properly manage domestic effluents **(2mks)**

23.a) Explain how the following factors increase the rate of diffusion **(3mks)**

i) Temperature

ii) Diffusion gradient

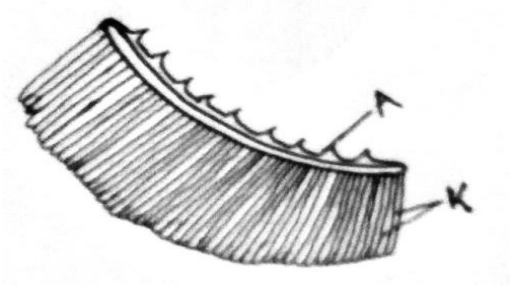
iii) Size of diffusing particles

c) Diffusion is a passive process while active transport is an active process. Explain **(2mks)**

24.a) Waterlogging in terrestrial plants inhibit uptake of certain mineral ions from the soil by the plants. Explain **(3mks)**

b) State two illustrations of Osmosis in plants **(2mks)**

25. The diagram below represents a gill of a fish



i) State ***two*** ways in which a large surface area is created in structures labelled K **(2mks)**

ii) Name the type of flow system that occurs between water and blood in the capillaries present on structures K **(1mk)**

iii) Name an organ in human beings that also display the flow system named in (ii) above **(1mk)**

26. Identical twins were separated after birth and were then raised in different environments. One in Kenya and the other in U.S.A. They rejoined after 18 years and they looked slightly different.

i) Name the type of variation the twins exhibited **(1mk)**

ii) Give two observable differences likely to be noted between the twins **(2mks)**

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

TOP STUDENT KCSE PREDICTIONS

SERIES 1 TRIAL 10 BIOLOGY PAPER 2

Kenya Certificate of Secondary Exams

TIME: 2 HOURS

INSTRUCTIONS

1. Answer all questions in section A and question 6 in section B (It is compulsory)
2. Answer either question 7 or 8.

SECTION A (40MKS)

Answer all the questions in these section

1. Haemophilia is a sex linked characteristic caused by a recessive gene located on one of the sex chromosomes.

a) Name the chromosome onto which the gene for haemophilia is linked to **(1mk)**

b) A normal man for the condition marries a normal woman for the condition but sadly one of their sons develop this condition from birth.

i) What are the likely genotypes of this couple? **(2mks)**

Man

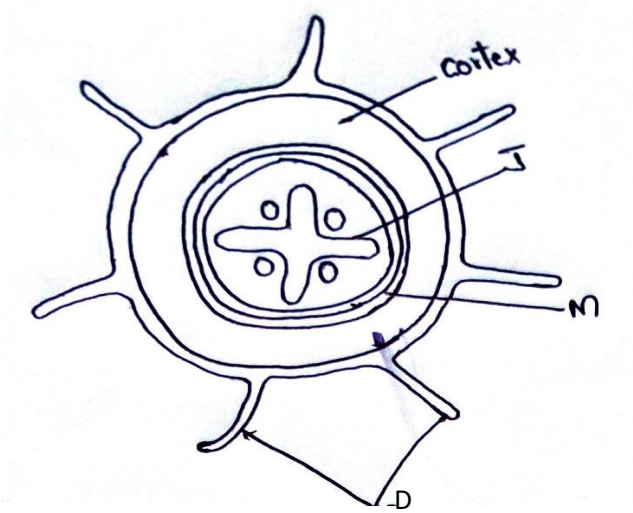
Woman

ii) Using a punnet square, carry out a cross to show why the couple gave birth to haemophiliac son **(4mks)**

Use (H),to represent the gene for normal condition and (h) to represent the gene for haemophilia

iii) Why is this haemophiliac condition very common in males than in female **(1mk)**

2. The figure below represents an organ obtained from a section of a plant. Use it to answer questions that follow.



a) **i)** Name the organ from which the above section was obtained. Give a reason for your answer **(2mks)**

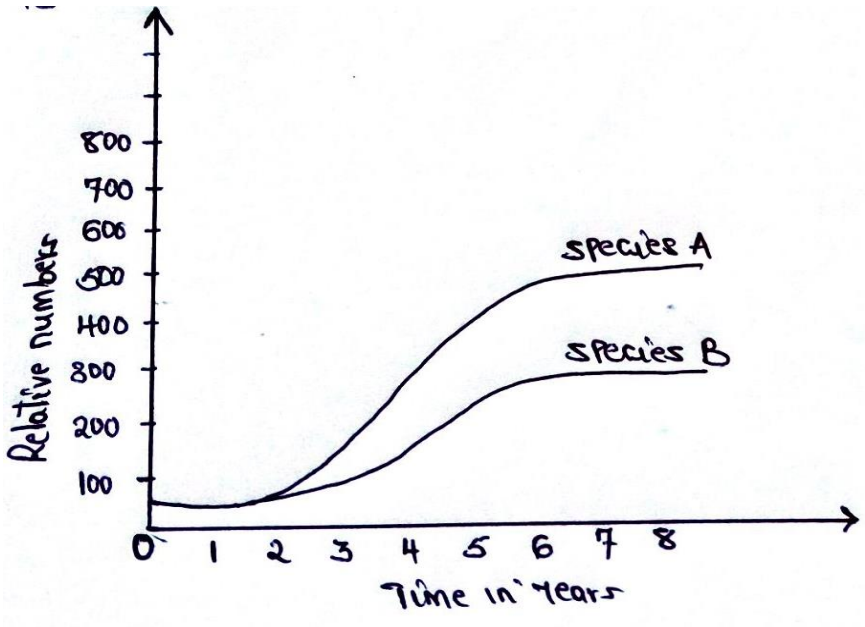
ii) Structure labelled J is described as a mechanical tissue. Explain **(1mk)**

b) **i)** Name the process by which water passes across structure M (**1mk)**

ii) Explain ***<u>two</u>*** ways by which cells with structures Dare adapted to their functions **(2mks)**

c) Name two strengthening materials that strengthen the collenchyma tissue **(2mks)**

3. The herbivorous mammalian species were introduced into an ecosystem at the same time and in equal numbers. The graph below represents their populations during the first seven years. Study the graph and answer the questions that follow.



a) **i)** Which species has a better competitive ability **(1mk)**

ii) Give reason for your answer **(1mk)**

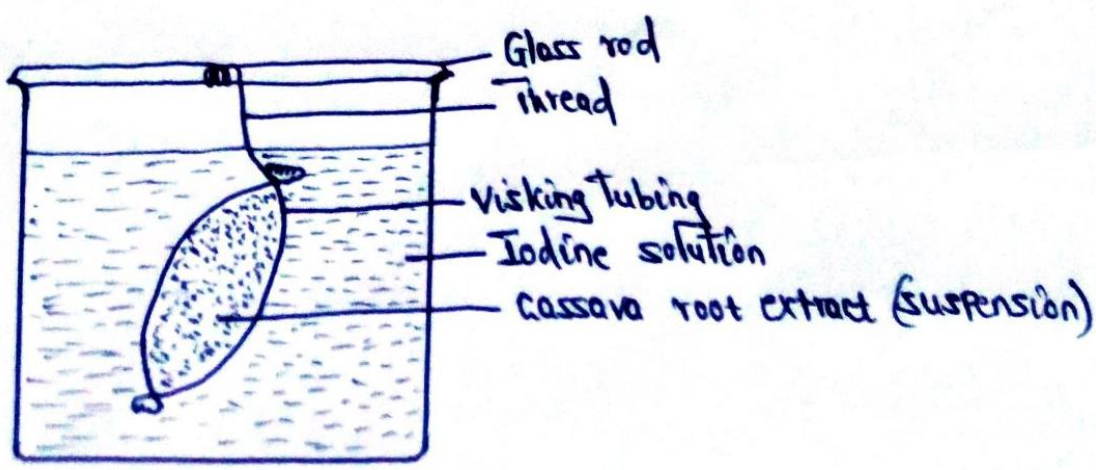
b) Account for the shape of the curve of species A between

i) One year and three years **(2mks)**

ii) Three years and seven years **(2mks)**

c) A natural predator for species A was introduced into the ecosystem. With a reason state how the population of each species would be affected **(2mks)**

4. A student from Abogeta secondary set up an experiment as illustrated below.



The visking tubing was left in iodine solution for 4 hours.

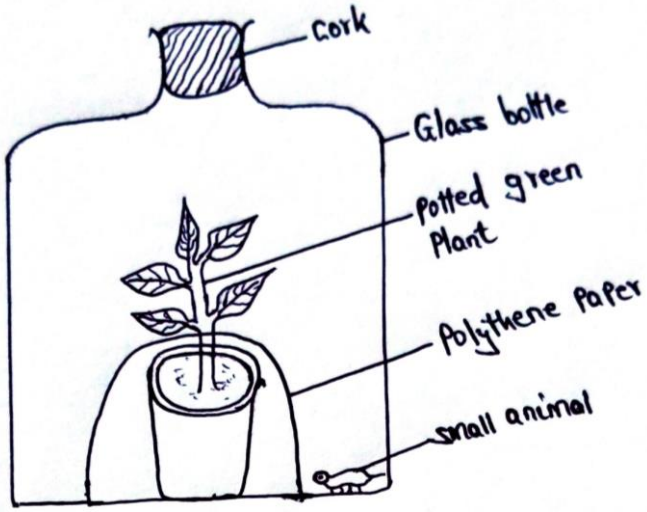
a) State the physiological process being investigated **(1mk)**

b) i) What were the expected results in the visking tubing and in the beaker **(2mks)**

ii)Account for your expected result in visking tubing **(2mks)**

c) Mention three factors that influences the rate of active transport **(3mks)**

5. An experiment was set up to investigate a factor in autotrophism in green plants.



Vaseline was applied at joint between the cork and the mouth of glass bottle and set up was left under sunlight for 6 hours.

a) Why was it necessary;

i) To apply Vaseline **(1mk)**

ii) To cover the pot with polythene paper **(1mk)**

iii) What was the purpose of including the small animals? Give two reasons. **(2mks)**

b) i) What would happen to the small animal if the set up was left over night in darkness **(1mk)**

ii) Account for the answer in b (i) above **(1mk)**

c) State the respiratory surface of the following organism **(2mks)**

i) Amoeba

ii) Fish

SECTION B (40MKS)

Answer question 6 (Compulsory) and choose either question 7 or 8

6. A hungry person had a meal, after which the concentration of glucose and amino acids in the blood were determined. This was measured hourly as the blood passed through the hepatic portal vein and the iliac vein in the leg. The results were as shown in the table below.

Time (Hrs)	**Concentration of contents in Hepatic portal vein (Mg/100ml)**		**Concentration of contents in the iliac vein of the leg (Mg/100ml)**	
	Glucose	**Amino acids**	**Glucose**	**Amino acids**
0	85	1.0	85	1.0
1	85	1.0	85	1.0
2	140	1.0	125	1.0
3	130	1.5	110	1.5
4	110	1.5	90	3.0
5	90	3.0	90	2.0
6	90	2.0	90	1.0
7	90	1.0	90	1.0

a) Using the same axes draw graphs of concentration of glucose in the hepatic portal vein and the iliac vein in the leg against time **(7mks)**

b) Account for the concentration of glucose in the hepatic portal vein from;

i) 0-1 hour **(2mks)**

ii) 1-2 hours **(3mks)**

iii) 2-4 hours **(3mks)**

iv) 5-7 hours **(2mks)**

c) Account for the difference in the concentration of glucose in hepatic portal vein and the iliac vein between 2 and 4 hours **(2mks)**

d) Using the data provided in the table explain why the concertation of amino acids in the hepatic portal vein took longer to increase **(1mk)**

Essays

7. **a)** Describe the opening and closing of the stomata using the photosynthetic theory **(10mks)**

   b) Describe blood sugar regulations in mammals **(10mks)**

8. **a)** Describe the adaptation of the following plants to their habitat;

   i) Xerophytes **(15mks)**

   ii) Hydrophytes **(5mks)**

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The following KASNEB notes are available;

- ATD
- CPA
- CS
- CIFA

Call Mdm.Mariam:0746711892 to acquire them

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Other available resources are;

- well summarised primary and secondary notes
- F1-F4 termly exams
- primary exams
- KCSE past papers
- KCPE past papers
- Mocks
- lesson plans
- schemes of work