231/1
BIOLOGY
THEORY
Paper 1
2 Hours

ALLIANCE BOYS HIGH SCHOOL PRE-MOCK EXAM .

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 – 24	80	

1. (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)

2. (a) Why would you give an athlete glucose and not sucrose after a race? (1mk)

(b) What happens to lactic acid after oxygen debt recovery? (2mks)

3. (a) What is gene mutation (1mk)

(b) State **two** disorders in human beings caused by gene mutations (2mks)

(c) What name is given to the factors in the environment that encourage or speed up mutation? (1mk)

4. State the role of the following elements to the growth and development of plants (3mks)

(i) Calcium

(ii) Magnesium

(iii) Nitrogen

5. State **three** environmental factor that affect the rate of stomatal transpiration (3mks)

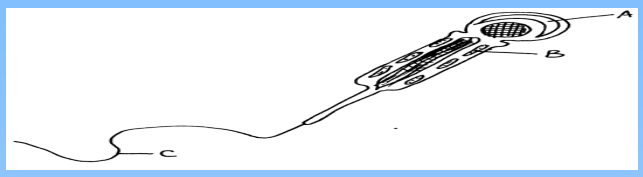
6. (a) What is the function of the following parts of the male reproductive system (3mks)

(i) Epididymis:-

(ii) Seminal vesicle:-

(iii) Interstitial cells:-

(b) The diagram bellow shows the structure of a sperm cell. Identify the parts labeled A, B and C and state their functions (6mks)



PART	IDENTITY	FUNCTION
A		
B		
C		

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

(i) Species:

(ii) Binomial nomenclature:-

(b) A certain sea animal has a smooth skin, lungs, regulates its body temperature and gives birth to young ones. The animal belong to the class (1mk)

8. For a leaf to be efficient for photosynthesis it has to be broad and flat. Explain (2mks)

9. (a) In an accident, a victim suffered brain injury. Consequently the heart beat was affected.

Name the part of the brain which was injured (1mk)

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

10. Differentiate between convergent evolution and divergent evolution (2mks)

Convergent

Divergent

11. (a) State **two** physiological changes that take place in a human skin in order to facilitate heat loss from the body. (2mks)

(b) State **two** functions of sebum (2mks)

12. (a) Define the term Homeostasis (1mk)

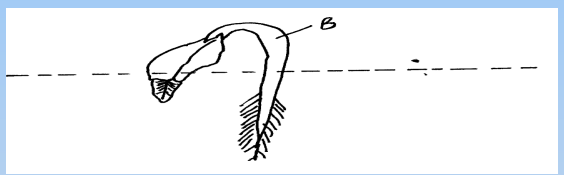
(b) State **one** way by which mammalian blood carry out homeostasis function (1mk)

(c) Differentiate between nervous and endocrine communication in animals

(3mks)

Nervous communication	Endocrine communication
(i)	
(ii)	
(iii)	

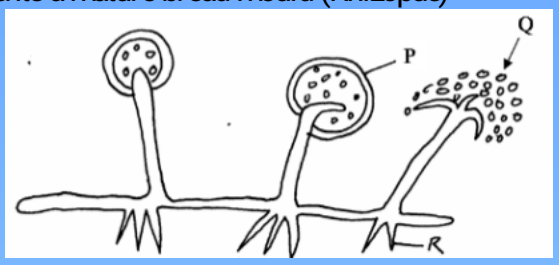
13. (a) Name the cartilage found between the bones of the vertebral column (1mk)
    (b) State the function of the cartilage named in (a) above (1mk)
14. State the functions of the following organelles:
    (a) Lysosomes:- (2mks)
    (b) Golgi apparatus:-
15. What is parthenocarpy? (1mk)
16 State **three** reasons why geneticists prefer to use **drosophila melanogaster** (fruitfly) for genetic experiments. (3mks)
17. What is the significance of active transport in the human body. (3mks)
18. In an attempt to clear a certain weed from St. Thomas Moore fish pond, Riang'ombe Sec. School Biology students introduced a species of beetles into the pond.
    (a) Give the term used for this method of control (1mk)
    (b) State **two** advantages of this method over the use of herbicides (2mks)
19. (a) State the causative agent of cholera (1mk)
    (b) What is the cause of dehydration in cholera victims (1mk)
20. (a) The numbers of chromosomes in a Gorilla cheek cell is 48. State the number of chromosomes in a Gorilla's ovum. (1mk)
    (b) Give the role of each of the following during cell division (2mks)
        (i) Centrides:-
        (ii) Spindle fibres:-
21. The diagram below shows a germinating seedling



    (a) Name the part of the seedling labeled B (1mk)
    (b) State the type of germination exhibited above (1mk)
22. (a) Name **two** hormones that control metamorphosis in insect (2mks)
    (b) Identify the plant hormone responsible for
        (i) Callus tissue formation (1mk)
        (ii) Formation of abscission layer (1mk)
        (iii) Fruit ripening (1mk)
23. (a) Name **three** ways by which flowering plants eliminate waste products from their body (3mks)
    (b) What is the importance of the following excretory products from plants (3mks)
        (i) Papain:-
        (ii) Nicotine:-
        (iii) Quinine:-
24. State **three** types of skeletons found in animals (3mks)

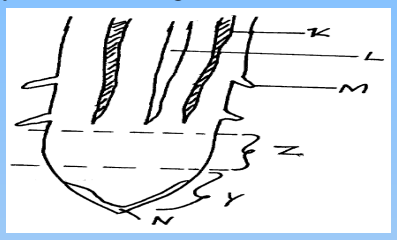
SECTION A: (40 MARKS)
Answer all the questions in this section in the spaces provided

1. The diagram below represents a mature bread mould (Rhizopus)



(a) Name the structures P, Q and R (3mks)
(b) What is the function of the structure P? (1mk)
(c) State **two** economic importances of moulds (2mks)
(d) (i) Name the kingdom to which bread mould belong (1mk)
(ii) List down **one** general characteristic of member of the kingdom named in d (i) above. (1mk)

2. The diagram below represents a longitudinal section through a dicotyledonous root tip.

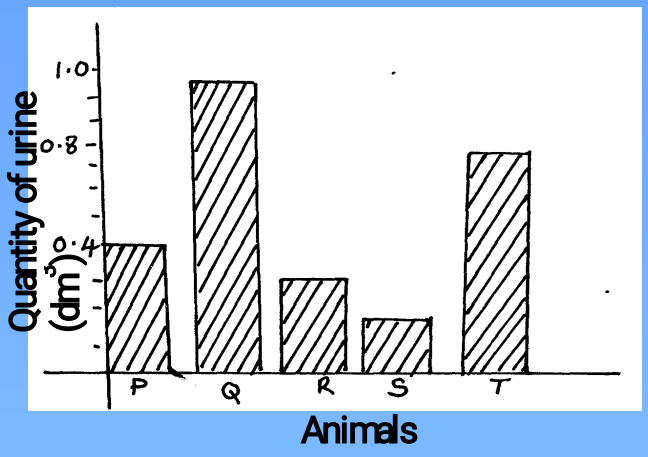


(a) State the function of the part labeled **M** (1mk)
(b) State the function of the part labeled **N** (1mk)
(c) Name the process by which water moves from the soil particles into plant root(1mk)
(d) How is the structure labeled **L** different from that of the stem of the plant. (1mk)
(e) Name the zones labeled **Y** and **Z** (2mks)

3. Pure breed of red cows and pure breed of white bulls were crossed to give F_1 calves which had a mixture of red and white coat known as roan. The F_1 were selfed.

(a) Using letter R to represent gene for red colour and W to represent gene for white colour work out the phenotypic ratio of F_2. (4mks)
(b) Work out the genotypic ratio of a cross between F_1 offspring and white bull. (3mks)
(c) Comment on the gene(s) controlling the colour of coats in cattle mentioned above. (1mk)

4. The quantities of urine passed out per day was established in five animals P, Q, R, S and T of the same species in their natural habitants. The results were as shown below.



(a) (i) Which of the five animals was likely to be excreting urine very rich in ammonia. (1mk)

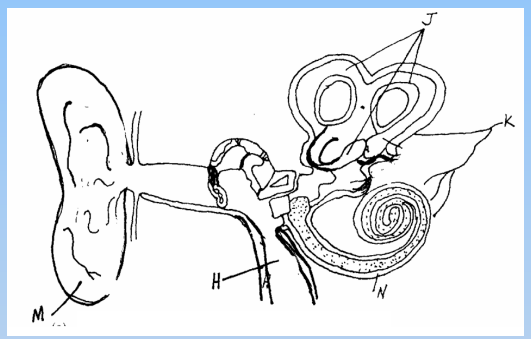
(ii) Give a reason for your answer in (a) (i) above (1mk)

(b) (i) Which of the animals was likely to be liveng in a desert environment (1mk)

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

(c) Explain how ingestion of very salty food may affect the quantity of urine produced.(2mks)

5. The diagram below represents a section through the mammalian ear. Study it and answer the questions that follow.



(a) Name the structures labeled H and J (2mks)

(b) State how the structures labeled H, M and N are adapted to their functions (3mks)

(c) State what would happen if the structure labeled K was completely damaged (1mk)

(d) Name the fluid contained in structure N (1mk)

(e) Apart from hearing, state the other role performed by the human ear (1mk)

SECTION B (40 MARKS)

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

6. The table below shows the population of a housefly *Musca domistica* which is parasitized by wasps of species *Nasonia Spp*. The investigation of their population growth pattern was carried out for 70 weeks. In these experimental space and physical factors were assumed not to be limiting.

Time in weeks	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70
Musca domestica	40	70	110	260	350	480	400	395	350	40	60	140	250	240	230
Nasonia spp	10	20	30	45	100	200	300	380	410	250	60	20	40	200	280

(a) Using the readings in the table, plot graphs on the same axis of population growth of organisms against time. (8mks)



(b) Account for the growth of
- (i) *Musca domestica* between 10^{th} week – 25^{th} week (1mk)
- (ii) *Nasonia species* between 40^{th} week – 50^{th} week (1mk)

(c) What is the population of?
- (i) *Nasonia Spp* on the 62^{nd} week (1mk)
- (ii) *Musca domestica* on the 4^{th} week (1mk)

(d) Bemex, another parasite of housefly was introduced into the ecosystem. Giving a reason what will be the effect on the population of
- (i) Housefly *Musca domestica* (2mks)
- (ii) *Nasonia Spp* (2mks)

(e) In estimating the population of *Musca domestica* in the experiment above, capture-recapture method was used. **Describe** the procedure which was followed. (4mks)

7. Describe how fruits and seeds are suited to their models of dispersal (20mks)

8. (a) What is natural selection? (2mks)

(b) Describe how natural selection brings about adaptation of a species of a living organism to its environment. (18mks)

AND PRACTICE EXAM .

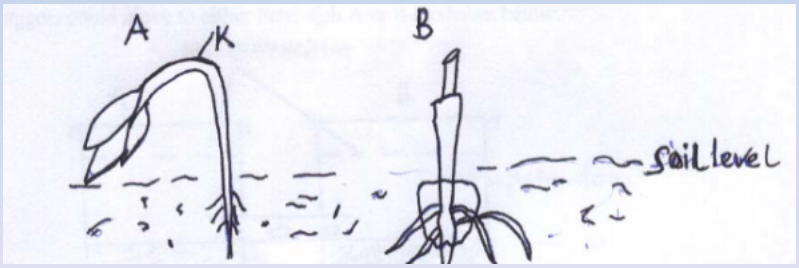
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1. **State** how each of the following parts of the mammalian ear are adapted to their function.
   a) Cochlea (2mks)
   b) Pinna (2mks)
2. **Give two** ways in which endotherms lose heat to the external environment. (2mks)
3. **What** is natural selection? (3mks)
4. **State three** evidences that support the theory of organic evolution. (3mks)
5. The table below shows description of sizes of glomeruli and renal tubules of two animals, which are living in different environments.

	Animal x	Animal y
Glomeruli	Large and few	Small and many
Renal tubules	Short	Long

   a) Name the likely environment in which each animal lives. (2mks)
   b) Suggest the main nitrogenous waste produced by animal Y (1mk)
6. A cell was found to have the following under a light microscope.
   Cell membrane, irregular in shape and very small vacuoles.
   Identify the type of cell above. (1mk)
7. (a) **State** what would happen to a cell if its nucleus was removed. (1mk)
   Reason
   (b) **Give** the function of nucleolus. (1mk)
8. (a) **Name** the products of the light reaction stage. (2mks)
   (b) **State** the site where the following stage of photosynthesis takes place. (2mks)
   -Dark stage
   - Light stage
9. (a) **Name two** nutrients that do not require digestion before they are absorbed.2mks)
   (b) **What** is assimilation? (1mk)
10. (a) **Give** a reason why the left ventricle muscles are thicker than the light ventricles muscles. (1mk)
    (b) **State** the form in which carbon (IV) oxide is transported in the blood. (2mks)
11. The diagrams below represent a stage of growth in two different seeds.

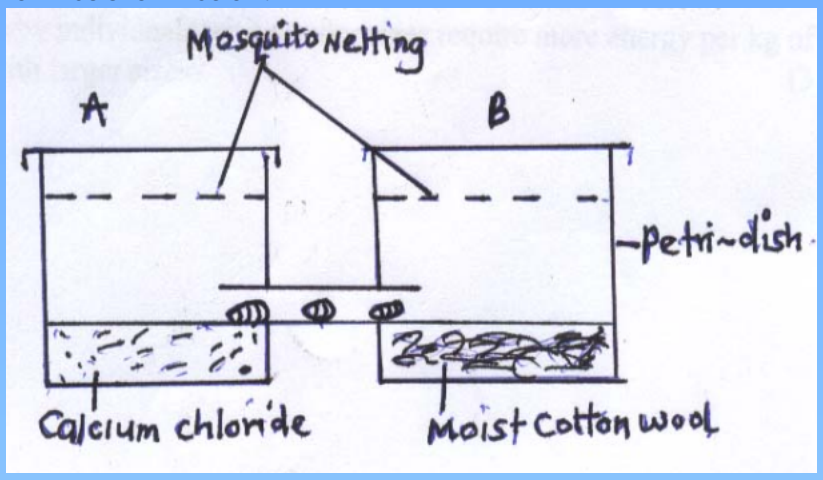


(a) **Identify** the type of germination exhibited by seedlings A and B and give a reason for each identity
A

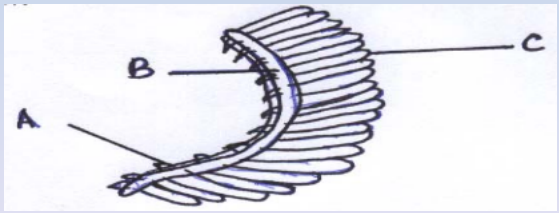
Reason
B
Reason

(b) **State** the function of the part labeled K. (1mk)

8. **Explain** how the following adaptations reduce transpiration in xerophytes
   (a) Sunken stomata (2mks)
   (b) Thick waxy cuticle (1mk)
9. The following experiment was set up in a chamber made from two connected Petri dishes. Housefly maggots were introduced at the centre of the chamber, so the maggots could move to either Petri dish A or B as shown below.



   (a) **Name** the type of response being investigated in the set up. (1mk)
   (b) **State** the survival value of the response named in (a) above. (1mk)
   (c) **Give** the role of calcium chloride in the experiment above. (1mk)
10. (a) **What** is sex linkage? (2mks)
    (b) **Name two** sex-linked characteristics in humans. (2mks)
11. **Name** the mechanisms that hinder self –fertilization in flowering plants. (3mks)
12. **Explain** why individuals with smaller sizes require more energy per kg of body weight than those with larger sizes? (3mks)
13. **State** the importance of placenta and amniotic fluid during pregnancy.
    -Placenta (2mks)
    -Amniotic fluid (1mk)
14. **Distinguish** between the two patterns of evolution:
    (a) Divergent and convergent evolution. (2mks) (b) **Why** was Lamarks theory of evolution rejected? (2mks)
15. **Name** the meristematic tissues responsible for:
    (a) Primary growth (1mk)
    (b) Secondary growth in plants (1mk)
16. The diagram below represents an organ from a bony fish, **study** the diagram and answer the questions that follow.



   (a) **State** the functions of each of the following A and B
   (b) **How** is the structure labeled C adapted to its function? (1mk)

17. **Give** the functions of the following parts of a light microscope (2mks)
(i) Objective lens
(ii) Condenser

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

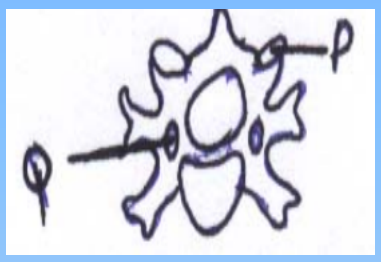
$$C_6H_{12}O_6 \longrightarrow \underset{\text{Substance x}}{2CH_3CH(OH)COOH} + 150KJ$$

(a) **Name** the process represented above (1mk)
(b) **What** is glycolysis? (1mk)

19. During estimation of cell sizes using a light microscope, a student found out the diameter field of view to be 2.7mm and diameter of field of view had 9 cells. The magnification was 50.
Calculate the actual length of one cell in microns (3mks)

20. **State** the functions of the following fins of a bony fish
(i) Dorsal fin (2mks)
(ii) Pelvic and pectoral fins (2mks)

21. The diagram below represents the anterior view of a vertebra study it and answer the questions that follow



(a) (i) **Name** the identity of the vertebra (1mk
Identity
(ii) **State** the function of each of the following structures P and Q (2mks)

22. (a) **What** is transpiration? (1mk)

23. (b) **Give** the importance of transpiration in green plants. (2mks)

24. **Distinguish** between habitat and ecological nitche.

MANG'U SCHOOL KCSE TRIAL AND PRACTICE EXAM.

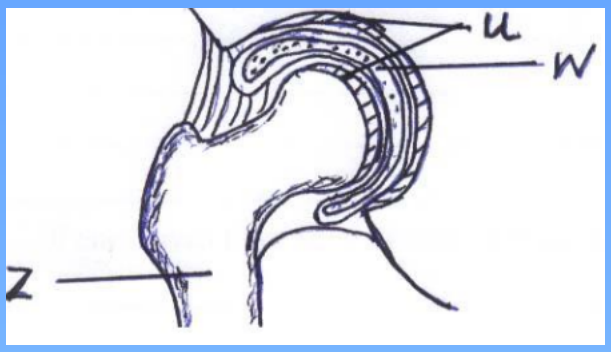
Paper 2

SECTION A: (40 MARKS)

1. In a family with four children, the father had blood group A while the mother had blood group B. One of the children had blood group 0.
(a) (i) **What** were the genotypes of the parents? (1mk)
-Mother
-Father
(ii) What was the genotype of the child with blood group 0? (1mk)
(b) **Work out** the genotypes of the other children.
(c) **Which** child can receive blood from any member of the family? (1mk)
(d) **State** the percentage of children who can donate blood at all blood groups. (1mk)

2. (a) **What** is active transport? (1mk)
(b) **State three** factors that increase the rate of active transport. (3mks)
(c) **Give four** roles of active transport in living organisms. (4mks)

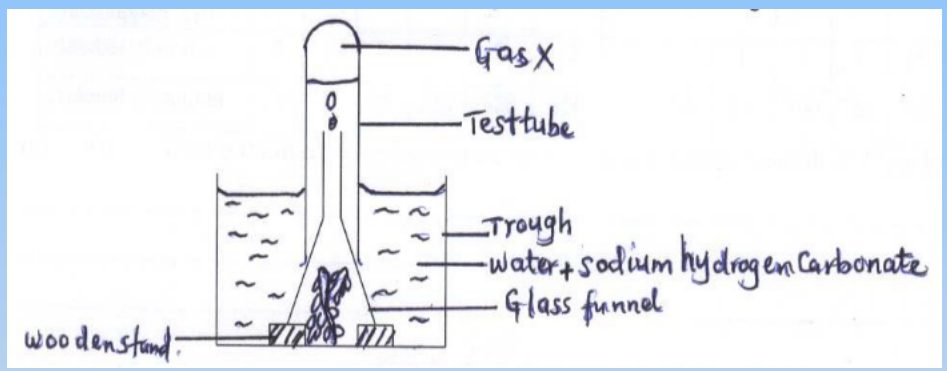
3. The diagram below represents one of the joints in the mammalian skeleton.



(a) **Name** the type of joint shown in the diagram.
(b) **Name** the parts labeled Z and U.
(c) **Name two** parts of the body where this type of joint is found. (2mks)
(d) **State** the functions of the fluid found in W. (2mks)
(e) **Name** the type of muscles found in the gut. (1mk)

4. (a) **What** is accommodation? (1mk)
*(b) **Describe** the sequence of events that occur in the eye for one to be able to see clearly*
(i) a distant object (4mks)
(ii) if one moved from a dim lit room to bright light. (3mks)

5. An experiment was set up to investigate a certain process as shown in the diagram below.



The set up was left in bright sunlight for 4 hours.
(a) **State** the aim of the experiment. (1mk)
(b) Name X and Y. (2mks)
(c) Other than sunlight, **name three** factors that would affect the experiment.
d) **State** how the identity of X could be confirmed. (1mk)
(e) **Explain** why only submerged water plants are used in this experiment. (1mk)

6. In an ecological study, a grass hopper 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.

Month	J	F	M	A	M	J	J	A	S	0	N	D
Number of adult grasshoppers $x10^2$	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

(i) **What** is the relationship between the rainfall and grasshopper population? (1mk)
(ii) (a) **Account** for the relationship stated in a (i) above. (3mks)

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

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

i. Grasshopper
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. (1mk)

(ii) One method that could have been used to estimate the grasshopper population. (1mk)

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

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

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

(h) What is an ecosystem? (3mks)

7. **Describe** the role of the liver in homeostasis. (20mks)

8. (a) **State three** reasons why transport is necessary in animals. (3mks)

(b) **Describe** how the mammalian heart is adapted to its function. (17mks)

PRECIOUS BLOOD KCSE TRIAL AND PRACTICE EXAM .

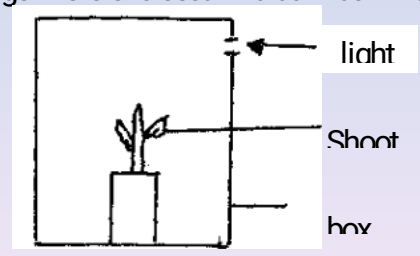
BIOLOGY
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Answer all questions in the spaces provided.

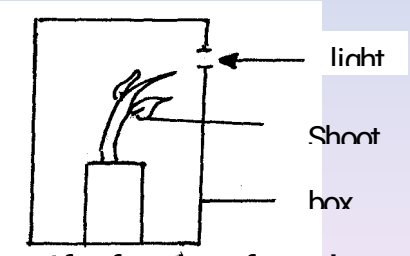
1. Name **one** of the end products of the dark reaction in photosynthesis (1mk)
2. Give **two** reasons why higher animals need an internal transport system (2mks)
3. a) Explain why a person discharges urine more frequently when environmental temperatures are low than when they are high. (2mks)
   b) Name the nitrogenous waster product excreted by a fresh water fish. (1mk)
4. Why is it important to use dry mass in ecological studies and not wet mass (2mks)
5. Identify the agent of dispersal of the following: (2mks)
   i) Fruits which split open along satures when dry, hauling their seeds away from the parent plant.
   ii) Light seeds with hairy extensions
6. Name the **three** main sites in plants through which gaseous exchange takes place (3mks)
7. Liver damage leads to impaired digestion of fats. Explain this statement. (2mks)
8. The diagram below represents an organelle involved in aerobic respiration.



   a) Identify the organelle (1mk)
   b) Name the parts labeled X and Y. (2mks)
9. Explain how the xylem vessels are adapted to their function. (3mks)
10. In cattle the gene for red hair (designated R) and that of white hair (designated W) are co-dorminant. When a red haired bull was mated with a white haired heifer, a roan calf was obtained in F1.
    i) Give the genotypes of the F1 offspring. (1mk)
    ii) Work out the phenotypic ration when the F1 are selfed. (3mks
11. State the function of the following in reproduction. (3mks)
    i) Placenta
    ii) Acrosome
    iii) Follicle stimulating hormone
12. State **three** evidences of organic evolution. (3mks)
13. In what form is oxygen transported from lungs to the tissues? (1mk)
14. The diagrams below show an experiment set up using growing bean seedlings. The been seedlings were enclosed in a dark box with a hole on one side as shown.



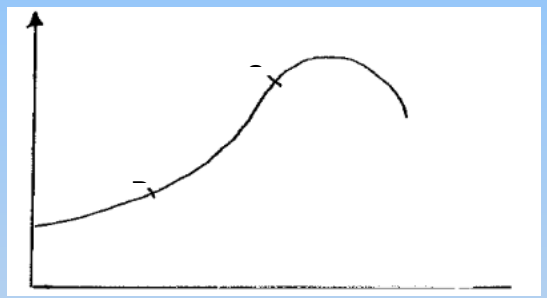
At beginning



After four days of growth

a) What type of response does the shoot above show? (1mk)
b) Account for the shape of the bean shoot after four days of growth. (3mks)

15. Explain why several lateral buds sprout when a terminal bud in a young tree is removed. (3mks)
16. State **three** factors that affect the rate of diffusion. (3mks)
17. Explain how the biceps and triceps muscles bring about the movement at the hinge joint of the elbow in man. (3mks)
18. Name **one** mechanism that hinders self pollination in flowering plants. (1mk)
19. In what ways are the gill filaments of fish adapted to heir function? (3mks)
20. State the function of the phloem tissue in plants (1mk)
21. a) In an experiment, it was found that when maggots are exposed to light, they move to the dark areas.
    i) Name the type of response exhibited by the maggots. (1mk)
    ii) State the survival value of the response in (a) (i) above. (1mk)
    b) During a road accident, an accident victim suffered head injury and consequently lost memory. Name the part of the brain that was damaged. (1mk)
22. a) What is meant by oxygen debt. (2mks)
    b) State one factor that affects basal metabolic rate. (1mk)
23. Explain what happens to excess glucose in the body. (3mks)
24. a) Name the hard outer covering of the members of the phylum arthropoda. (1mk)
    b) State **three** roles played by the structure named in (a) above. (3mks)
    c) State **one** other characteristic of the phylum arthropoda. (1mk)
25. Name **one** sex-linked trait in humans. (1mk)
26. The graph below represents a population growth curve of zebras in a grassland ecosystem over a period of time.



a) Account for the change in zebra population between points R and S on the growth curve above (3mks)
b) Name the most suitable method used in estimating the zebra population. (1mk)

27. Distinguish between convergent and divergent evolution. (2mks)
28. Explain how temperature affects the rate of photosynthesis. (3mks
29. Name **two** mechanical tissues which provide support in woody plants. (2mks)
30. State one role of hydrochloric acid secreted by the stomach wall. (1mk)
31. Explain what would happen to the red blood cells when they are placed in hypotonic solution. (3mks)

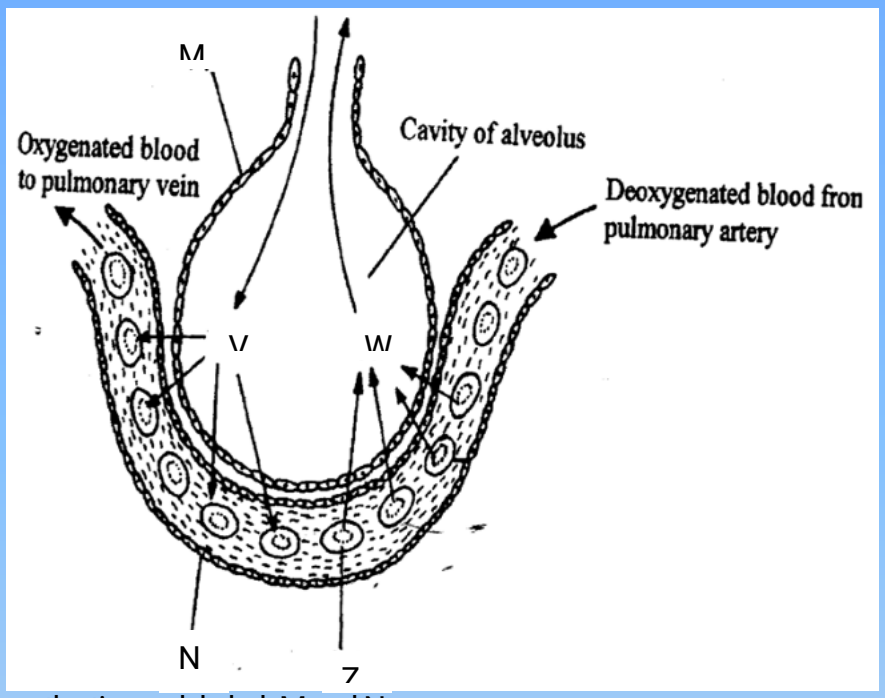
PRECIOUS BLOOD KCSE TRIAL AND PRACTICE EXAM .

Paper 2

SECTION A: (40 MARKS)

Answer all the questions in this section in the spaces provided

1. The diagram below illustrates the mechanism of gaseous exchange in mammalian lungs.



a) Name the tissues labeled M and N (2mks)

b) Name the gases labeled V and W (2mks)

c) Name the cell labeled Z (1mk)

d) State **three** adaptations of alveolus to its function. (3mks)

2. John ate rice and beans for breakfast.

a) State the physical and chemical processes that occurred in the mouth cavity.

Physical (1mk)

Chemical ... (1mk)

b) Name the digestive juices that will be released into (3mks)

i) The mouth cavity

ii) The stomach.

iii) The duodenun

c) Explain how the ileum is adapted to its functions (3mks)

3. Form three students in Geteri secondary were estimating the number of tsetse flies in a small bush near the school. At first they caught 400 tsetse flies, marked and released them. After five days, they caught 500 tsetse flies of which 80 had been marked.

a) i) Calculate the tsetse flies population in the bush. (3mks)

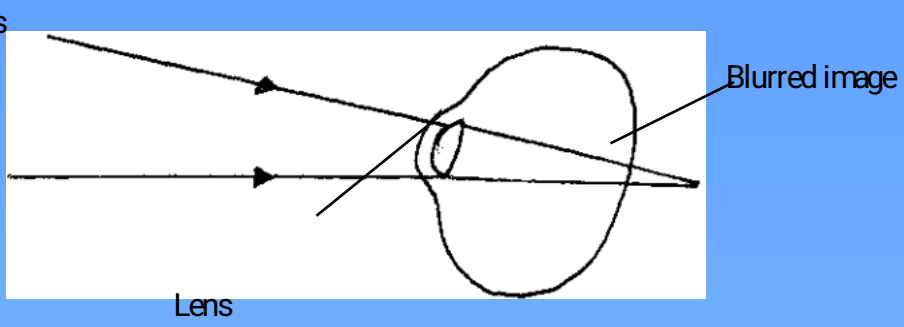
ii) State the method used in estimating the population of tsetse flies. (1mk)

b) State two abiotic and two biotic factors that influence tsetse fly population in a bush.

i) Abiotic factors (2mks)

ii) biotic factors (2mks)

4. a) The diagram below shows a defect in a human eye.



i) Name the defect. (1mk)

ii) State what brings about the defect in (a)(i) above. (1mk)

iii) State how the defect can be corrected (1mk)

b) Explain the changes in the eye during vision in bright light. (3mks)

c) State the functions of the mammalian ear. (2mks)

5. In a certain variety of tomato, a recessive mutant gene which is responsible for chlorophyll synthesis causes the leaves of the plant to be white when present in homozygous condition. This kind of plant dies soon after germination. In the heterozygous state, the mutant produces a plant with variegated leaves which normally completes its life cycle.

i) Suggest why the homozygous recessive plant is only able to survive germination but not to complete its life cycle thereafter. (3mks)

ii) Work out the phenotypic ratio of the offspring's that would be produced as a result of self pollination of the plants with variegated leaves. (5mks)

SECTION B: (40MARKS)

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

6. An experiment was carried out 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. mg/ml / 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)

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 perio (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. Describe how the mammalian heart is structurally adapted to its functions. (20mks)

8. Describe the events that take place from the time a pollen grain lands on the stigma of the flower up to the time the seeds form. (20mks)

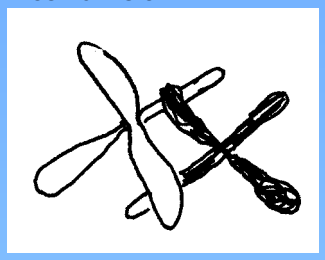
AND PRACTICE EXAM .

231/1
BIOLOGY
THEORY
PAPER 1
2 Hours

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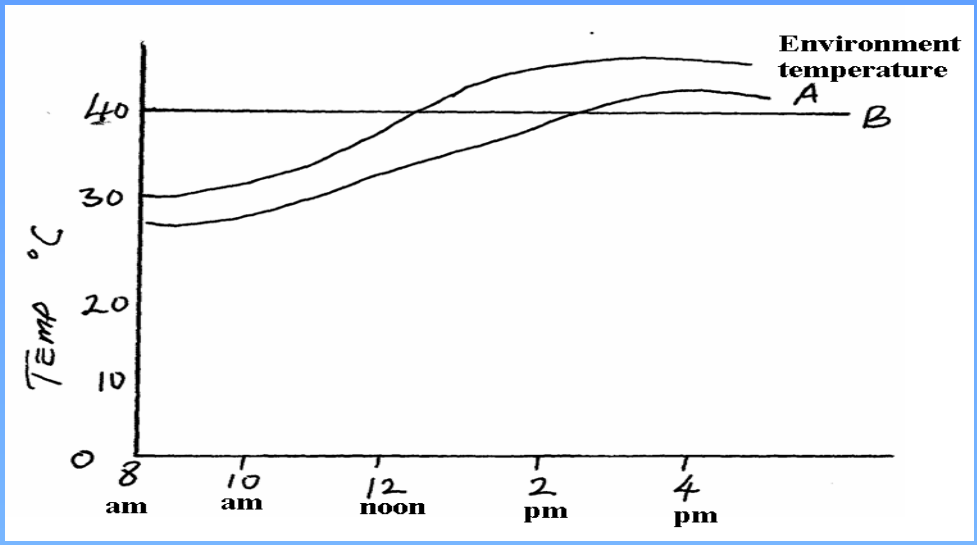
1 Define;
   a) Inter-specific competition (1mk)
   b) Intra-specific competition (1mk)

2. The diagram below is of a stage in cell division



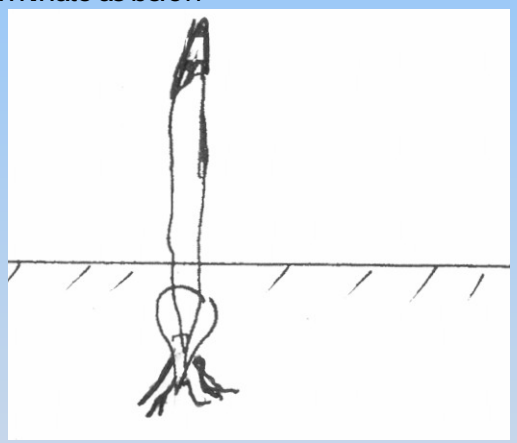
With a reason identify the stage. (2mks)
Stage
Reason

3. Name two mutagenic agents. (2mks)
4. The scientific name of the housefly is musca domestica. Classify the fly into; (2mk)
   i) Genus
   ii) Species
5. Cyanide is classified as one of the non-competitive inhibitors of enzymes. What is the meaning of the term non-competive inhibitor? (2mks)
6. Name two Vitamins of which their absence in the diet may cause a dental disease called gingivitis (2mks)
7. State three factors that maintain the transpiration stream. (3mks)
8. State the economic importance of each of the following plant excretory products.
   i) Cocaine (1mk)
   ii) Caffeine (1mk)
   iii) Nicotine (1mk)
9. a) Why is Lamarck's theory on mechanism of evolution not scientifically Acceptable? (1mk)
   b) What name is given to;
      i) Structures in animals that have become reduced in size until they are functionless (1mk)
      ii) Evolution of structures that have undergone modificator to adapt the organism to similar ecological niches. (1mk)
10. The body temperatures of two animals A and B varied as below with environmental Temperature

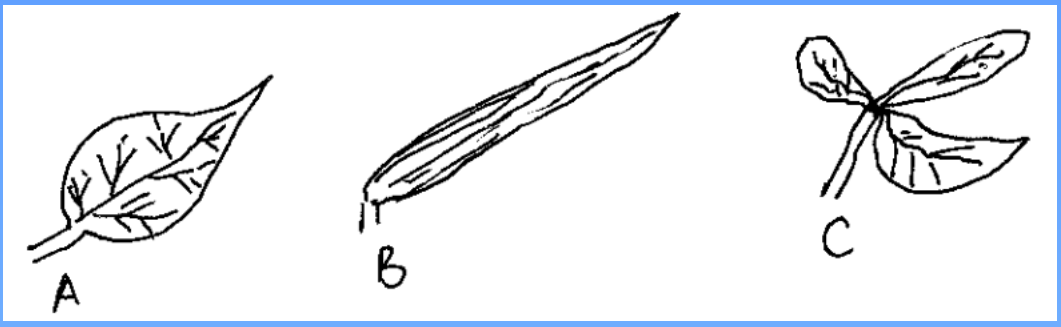


a) Which of the animals is;
   i) Endothermic (1mk)
   ii) Ectothermic (1mk)
   b) With a reason, state which of the animals is likely to be widely distributed (2mks)

11. a) State a structural difference between a sensory and motor neurone (2mks)
    b) What is a reflex arc? (2mks)
12. 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)
    iii) Eat instead of tea (1mk)
13. State three adaptations of halophytes to their habitat (3mks)
14. State three roles of oestrogen during the menstrual cycle (3mks)
15. A form IV student observed a seedling germinate as below



    With a reason identify the type of germination above. (2mks)
16. A man of blood group heterozygous **A** married a woman of heterozygous **B**; work Out the blood groups of their children (3mks)
17. a) How is the stigma of a wind pollinated flower adapted to its function? (1mk)
    b) Define the term double fertilization in plants? (2mks)
18. State three characteristics of cells at the zone of cell division in an apical merintem (3mks)
19. Explain the importance of the label "CFC FREE" on modern refrigerators (3mks)
20. Name three biotic factors of an ecosystem (3mks)
21. 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)



22. A Form IV student observed an heterotrophic organism with jointed appendages and whose body was divided into head, thorax and abdomen. Classify the organism into;
    i) Kingdom (1mk)
    ii) Phylum (1mk)
    iii) Class (1mk)
23. Define;
    i) Pulmonary circulation (1mk)
    ii) Systemic circulation (1mk)
24. Name three diseases against which children are immunized (3mks)
25. Name the site for gaseous exchange in the following animals
    i) Insects (1mk)
    ii) Fish (1mk)
    iii) Mammals (1mk)
26. Students estimating the number of grasshoppers in a field captured 72 grasshoppers which they marked find released. After two days the students captured 90grasshoppers of which 8 were marked.
    a) Why did the second capture take place after two days? (1mk)
    b) Calculate the total number of grasshopper in the field (3mks)
27. Name the contractive agent of typhoid and state two symptoms of the disease (3mks)
28. Name two neurotransmitter substances across neurons (2mks)
29. What type of variation is exhibited by the ability of man to roll or not roll the tongue? (1mk)

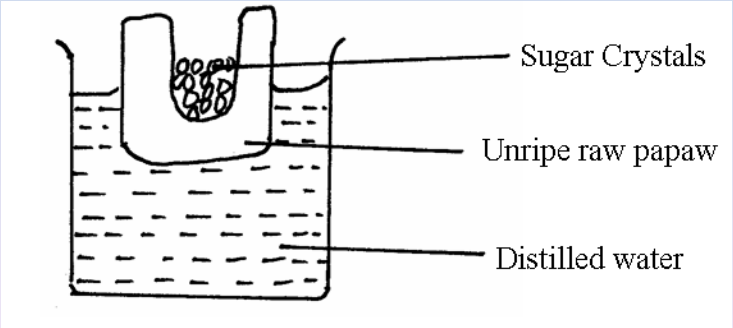
MOI GIRLS ELDORET KCSE TRIAL AND PRACTICE EXAM .

Paper 2

SECTION A : 40 MARKS

Answer All questions in the spaces provided)

1. A group of students set-up an experiment to investigate a certain physiological process. The set up was as shown in the figure below.



After sometime the student observed that a sugar solution was formed and its level rose in the cavity where sugar crystals were placed.

a) What physiological process was being investigated? (1mk)

b) Account for the formation of sugar solution and its rise in level. (3mks)

c) Suggest the result the students would obtain if they repeated the experiment using a boiled pawpaw. Give reasons (2mks)

d) State two importance of the physiological process named in 1 a) above to plants (2mks)

2. In an experiment some germinating seeds were placed in a large airtight flask and left for Four days.

a) Suggest the expected changes in the composition of gases in the flask on the fifth day. (2mks)

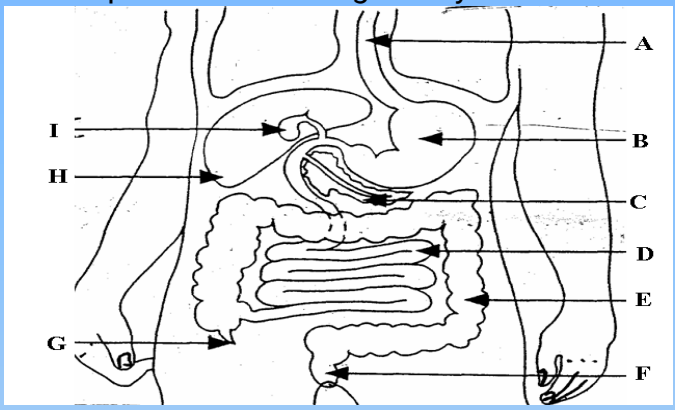
b) Give reasons for your answer a) above. (1mk)

c) Name two factors that cause dormancy in seeds. (2mks)

d) Account for the loss in dry weight of cotyledons in a germinating pea seed. (2mks)

e) Name the hormone that causes moulting in insects. (1mk)

3. The diagram below shows part of the human digestive system.



a) Identify the parts labeled **A, C, G** and **H** (2mks)

b) Name one substance absorbed at part labeled **E** (1mk)

c) State one role of the substance stored in structure labeled **I** in digestion. (1mk)

d) Explain three ways by which structure labeled **D** is adapted for absorption of the products of digestion (3mks)

e) State role of hydrochloric acid secreted by the walls of structure labeled **B**.1mk)

4. In a family with two children, the mother had blood group **A** while the father had blood group **B**. One of their children had blood group **AB**

a) i) What are the genotypes of the parents? (2mks)
Mother Father

ii) What was the genotype of the child with blood group **AB**? (1mk)

b) Determine the possible genotypes of the other children (4mks)

c) What is the advantage of having blood group AB? (1mk)

5. In an investigation to compare the basal metabolic rate of some animals, the amount of Oxygen absorbed per unit body weight in a given time was determined. The results are as indicated in the table below.

Animal	**Body weight (kg)**	**Volume of oxygen absorbed (gm/hr)**
Buffalo	4,500	53
Baboon	70	190
Dog	12	280
Rat	0.1	870
Mouse	0.025	1,580

a) What is the meaning of the term basal metabolic rate? (1mk)

b) i) Compare the volume of oxygen consumed between the buffalo and the mouse (2mks)

ii) Account for the comparison in b i) above

buffalo (2mks)

Mouse (2mks)

c) State one other factors that affects basal metabolic rate of an organism. (1mk)

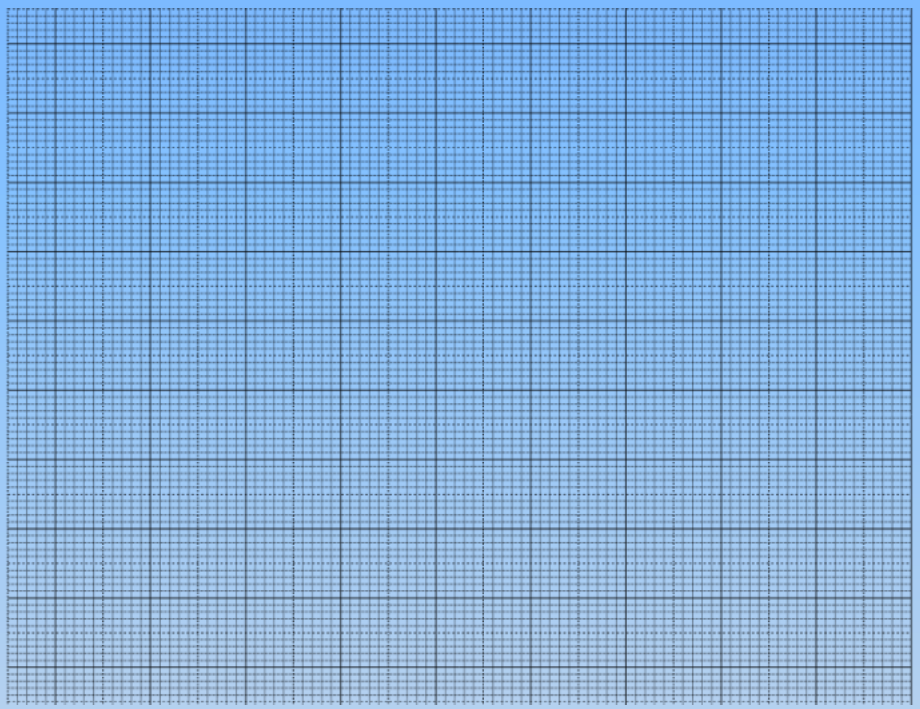
SECTION B. (40 MARKS)

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

6. Ten young rats were placed in a cage. The amount of food available to the mice each day was kept constant. The results obtained were as shown in the table below

Time in months	0	2	4	6	8	10	12	14	16	18
Number of rats	10	10	55	105	300	445	440	180	135	150

a) Using a suitable scale, plot a graph of a number of rats against tim (6mks)



b) Discuss the evidences of organic evolution ith reference to the graph, account for the changes in rat population between

i) 0 to 2 months (1mk)

ii) 2 to 10 months (2mks)

iii) 10 to 12 months (2mks)

iv) 12 to 16 months (2mks)

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

ii) Calculate the rate of population change over the period you have given in a) above (2mks)

d) Briefly describe how you would use the capture – recapture method to estimate the population of grasshoppers. (4mks)

7. Discuss the adaptations of the mammalian skin to its function. (20mks)

8. a) Explain the meaning of each of the following as used in evolution.

i) Natural selection (3mks)

ii) Struggle for existence (14mks)

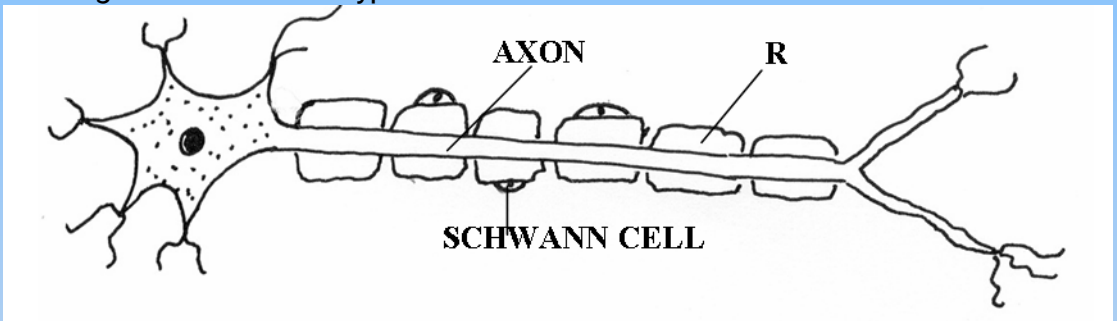
KAPSABET BOYS KCSE TRIAL AND PRACTICE EXAM .

231/1
BIOLOGY
THEORY
Paper 1
2 Hours

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1. a) State the functions of the following cell organelles. (2mks)
   i) Ribosomes
   ii) Lysosomes
   b) Name the only epidermal cell in plants that contain chloroplast. (1mk)
2. a) Name the causative agents of the following diseases. (2mks)
   i) Amoebic dysentery
   ii) Tuberculosis
3. a) What is the importance of the counter current flow in the exchange of gases in a fish. (2mks)
   b) State <u>two</u> ways in which the tracheoles of an insect are adapted to their functions. (2mks)

4 The diagram below shows a type of a neurone.



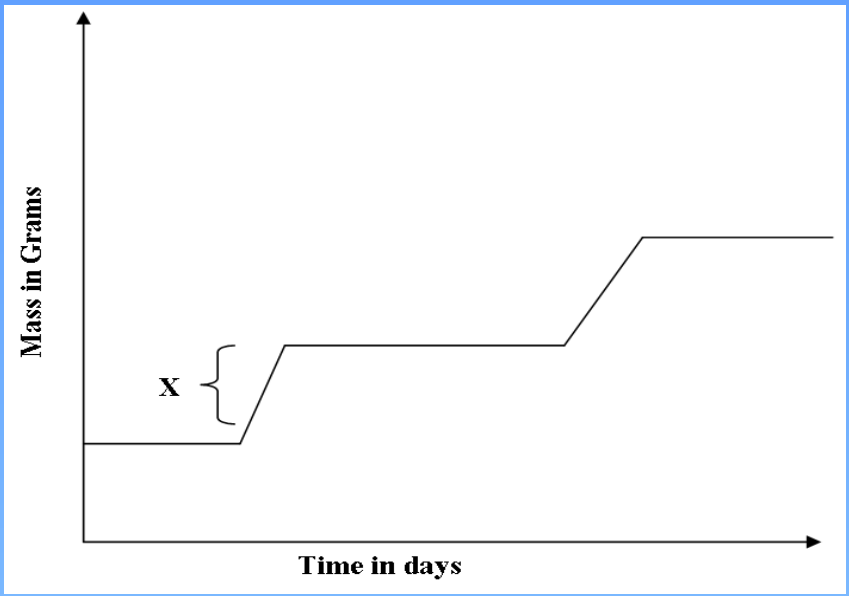
   a) Identify the neurone above. (1mk)
   b) Give a reason for your answer in 4(a) above. (1mk)
   c) State the function of the part labeled R (1mk)
   d) Use an arrow on the diagram to show the direction of the impulse transmission along the neurone. (1mk)

5. 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 <u>two</u> differences between K and ATP. (2mks)
   c) Name the organelle responsible for the production of energy in a cell muscle (1mk)

6. 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.

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

7. State **three** factors that affect absorption of mineral ions by plant roots. (3mks)

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

9. Name the type of responses exhibited by.

a) Tendrils when they twine on a support object. (1mk)

b) Butterflies and moths fly into wind currents in order to detect scent of flowers. (1mk)

10. The equation below represents a metabolic process that occurs in the mammalian liver.

Amino acids $\xrightarrow[\text{Enzyme x}]{}$ Organic compound + urea.

a) Name the process that represents the above equation. (1mk)

b) Identify the enzyme represented by x. (1mk

c) What is the importance of the process to the mammal (1mk)

11. A scientist carried out blood sugar test for a given patient at three different times of the day. He obtained the results shown below for glucose and glycogen level.

Time	6 a.m.	1.30 p.m.	4 p.m.
Glucose	90mg	100mg	90mg
Glycogen	20mg	40mg	60mg

Account for:

a) Presence of glycogen in blood. (2mks)

b) Rise in glucose and glycogen levels at 1.30p.m (2mks

12. a) What is the meaning of alterations of generations. (2mks)

b) Name one plant division which displays alteration of generation. (1mk)

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

14. 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.

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

Glucose + Fructose Sucrose + Water

i) Name the process X and enzyme R

Process X (1mk)
Enzyme R (1mk)

15. State **two ways** through which plants eliminate their metabolic wastes from their bodies (2mks)
16. a) What is double fertilization in flowering plants? (1mk)
    b) Name any two types of placentations found in ovaries. (2mks)
17. List down **four** phenotypic characteristics that have been selected for the production of strains suitable for modern agricultural purposes. (4mks
18. a) Name any **two** accessory glands in the male urinogenital system. (2mks)
    b) What structural modification do human sperm cell have that:
    i) Facilitate energy use. (1mk)
    ii) Facilitate movement. (1mk)
19. Name the type of eye defects that can be corrected by;
    i) Use of bifocal lens (1mk)
    ii) Use of artificial lens (1mk)

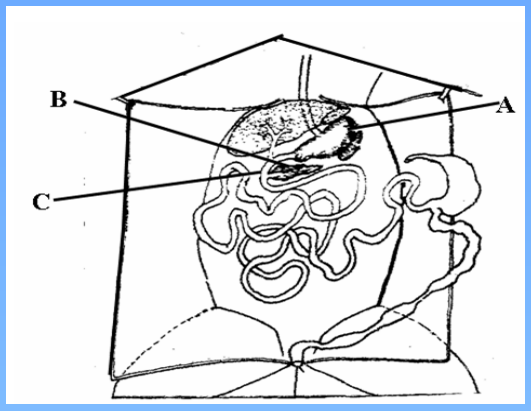
    iii) Use of concave lens (1mk
20. a) The length from the tail tip to the anus of a certain tilapia fish is 10cm. The length from the tail tip to the mouth is 35cm. Calculate the tail power of the fish. (Show all your working). (2mks)
    b) What is the significance of high tail power in fish? (1mk)
21. State the roles of each of the following hormones in the process of reproduction in human male.
    i) Follicle stimulating hormone. (1mk)
    ii) Luteinising hormone. (1mk)

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

Endocrine system	Nervous system
i. …… ii …… iii ……	i. …… ii …… iii ……

23. Distinguish between the struggle for existence and survival for the fittest as used in the theory of natural selection. (2mks)
24. State **three** structural feature of the placenta which facilitates the diffusion of substance between the maternal and foetal blood. (3mks
25. Give one functional difference between a tendon and a ligament in a mammal. (1mk)
26. State the functions of the following parts of a light microscope. (2mks)
    i) Diaphragm
    ii) Objective lens
27. Explain how the following adaptations minimizes rate of transpiration.
    i) Sunken falling (2mks)
    ii) Leaf dropping (1mk)
28. State **one** structural difference between mature red blood cells and white blood cells.(1mk)

1. The diagram below shows the mammalian digestive system. Study it carefully and answer the questions that follow.



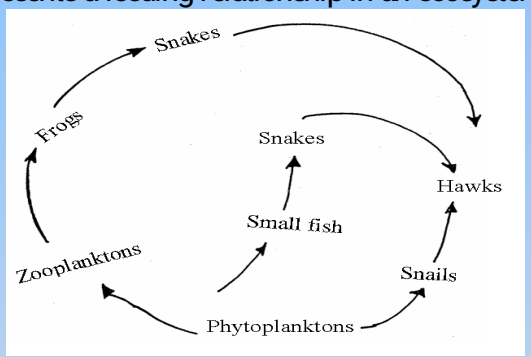
a) i) Name the parts labeled A and B. (2mks)

ii) How is the structure labeled A in the diagram adapted to carry out its function? (2mks)

b) i) Name the hormone secreted by the walls of part labeled C (1mk)

ii) Explain the role of the hormone in b (i) above in digestion. (3mks)

2. The diagram below represents a feeding relationship in an ecosystem.



a) Name the type of ecosystem represented by the above food web. (1mk)

b) Name the organisms in the food web that

i) Are producers (1mk)

ii) Occupies the highest trophic level (1mk)

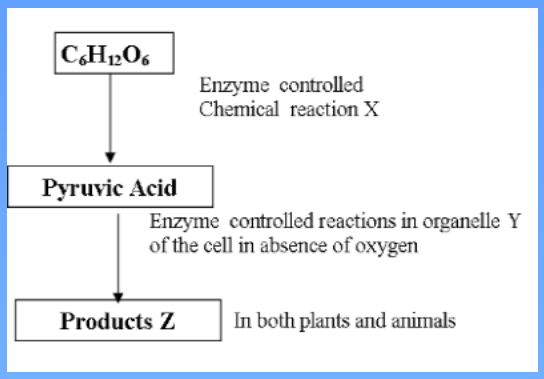
c) i) Write a food chain that ends with the hawk as quaternary consumer. 1mk)

ii) State **two** short term effects on the above ecosystem if all the small fish were killed. (2mks)

d) How does oil spills lead to death of fish. (1mk

e) Name **one** other cause of water pollution apart from oil spills.(1mk)

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



a) Name the above process. (1mk)

b) i) In the above process name the chemical reaction represented by X.(1mk)

ii) Name the part of the cell where the enzyme controlled reactions in b(i) above takes place. (1mk)

c) Name the products Z in

i) Plants (1mk)

ii) Animals (1mk)

d) What would be the fate of pyruvic acid if oxygen supply is availed in the mitochondria of an animal cell (2mks)

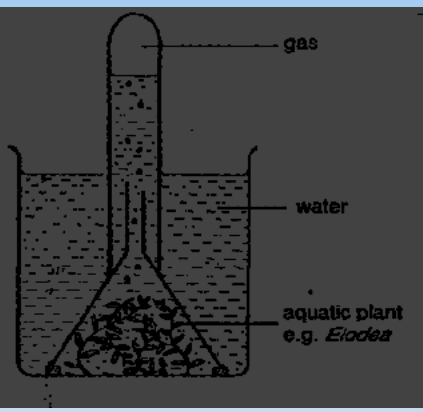
e) What is meant by the term oxygen debt? (1mk

4. a) Define multiple allelism and give an example. (2mks)

b) In Drosophila melanogaster the gene for eye colour is sex linked. The gene for red eye is dominant. A cross was made between a homozygous red eye female and a white eyed male. Workout the phenotypic ration of the F1 generation. (Use R to represent the gene for red eyes.) (4mks)

c) Suggest two reasons to explain why Drosophila melanogaster is the most preferred organisms for studies in modern genetics. (2mks)

5. An experimental set-up below was placed in the sun for some days. The rate of bubbles given off per unit time, from the cut end of the water plant (Elodea) was measured. The results obtained are shown in the table below.



Results

Day	Daylight condition	Average number of bubbles per minute
1	very cloudy and dull	3
2	less cloudy	8
3	quite sunny	15
4	very bright sun-shine	25
5	cloudy and dull	4

a) i) Name the gas that was given off by the plant. (1mk)

ii) Name the biological process that the gas in a(i) produces. (1mk)

b) What conclusion is drawn from the results obtained in this experiment? (1mk)

c) You are provided with an electric bulb, a metre rule and a light meter. Briefly describe how you would use this experimental set-up in the laboratory to demonstrate the effect of light intensity on the rate photosynthesis (4mks)

d) Suggest one possible experimental error that may occur in this experiment. (1mk)

SECTION B: (40 MARKS)

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

6. An experiment was carried out to investigate the effect of heat on germination of seeds. Ten bags each containing 60 pea seeds were placed in water-bath maintained at 85^0C. After an interval of two minutes a bag was removed and seeds planted. The number that germinated was recorded. The procedure used for pea seeds was repeated for wattle seeds. The results were tabulated as in the table below.

Time (Minutes)	Number of seeds that germinated	
	Garden pea seeds	Wattle seeds
0 – 2	60	0
2 – 4	60	0
4 – 6	44	1
6 – 8	40	2
8 – 10	36	28
10 – 12	11	36
12 – 14	2	41
14 – 16	1	44
16 – 18	1	47
18 – 20	0	49
20 – 22	0	49

a) Using a suitable scale and on the same axes, draw graphs of time in hot water against number of seeds that germinated for each plant.(7mks)

b) i) After how many minutes would you expect 50% of wattle seeds exposed in hot water to germinate. (1mk)

ii) What was the minimum number of minutes after exposure of garden pea seeds to hot water was there no germination. (1mk)

c) From the graph, which of the **two** types of seeds was more sensitive to heat influence on germination. Why? (1mk)

d) Explain why the ability for the:

i) Garden pea seeds to germinate declined with the time of exposure to heat (3mks)

ii) Wattle seeds to germinate increased with time of exposure to heat. (2mks)

e) What results would be expected if the temperature of water was maintained at temperatures.

i) Above 85^0C (1mk

ii) At 5^0C (1mk)

f) Apart from temperature state three internal factors necessary for seed germination.(3mks)

7. a) Briefly describe the circulation of blood in a mammalian heart. (6mks)

b) Discuss the pumping mechanism of the heart. (14mks)

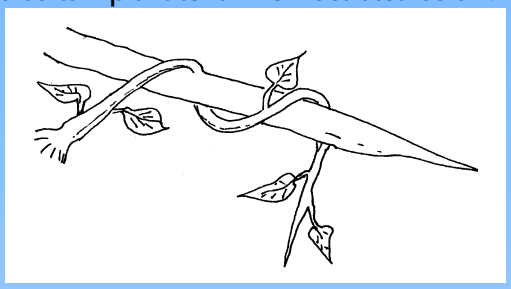
8. Describe the role played by growth hormones in growth and development in plants. (20mks)

231/1
BIOLOGY
THEORY
PAPER 1
2: Hours

1. State the organelles that perform the following functions (3mks)
   i) Synthesis of ribosomes
   ii) Transport of lipids
   iii) Package and transport of glycol-proteins
2. During a strenuous exercise, the chemical process represented by the equation below takes place in human muscles.

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

   Glucose Substance X
   a) What is the name of this process (1mk)
   b) Name the substance X (1mk)
   c) What happens to the muscles if X accumulate to critical levels (1mk)
3. A response exhibited by a certain plant tendril is illustrated below.



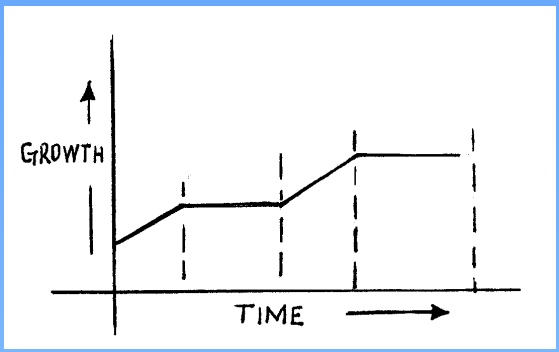
   a) Name the type of response (1mk)
   b) Name the type of plants that uses the named response in (a) above for support (1mk)
4. Explain what would happen to the following cells transferred from their normal condition into distilled water
   a) Amoeba (2mks
   b) A plant parenchyma cell (2mks)
5. a) Name the structure in the body that detects changes in internal temperature (1mk)
   b) State two physiological changes that occur in human body when internal temperature tends to drop below normal (2mks)
6. Explain how the following factors affect the rate of transpiration.
   i) Sunken stomata (2mks)
   ii) Light intensity (2mks)
7. State the function of cardiac sphincter in the stomach (2mks)
8. a) What is meant by the term sex-linked genes? (1mk)
   b) Give an example of a sex linked trait in humans on (2mks)
   Y – chromosome
   X – chromosome
9. Name three processes in living things that depend on diffusion. (3mks)
10. a) State the difference between ball and socket joint and the hinge joint (1mk)
    b) Name the structures that join bones together to form a joint (1mk)
    c) Name the structures at the elbow that performs the same function as the patella (1mk)
11. State the function of each of the following parts of the human ear. (3mks)
    a) Ear ossicles
    b) Cochlea

c) Semi-circular canals

12. List two advantages of staining cells and tissues before observing them under the microscope (2mks)

13. Of what importance is Luteinising hormone in male reproductive system (1mk)

14. The graph shows a growth curve of insects.



a) State one feature that is responsible for the pattern of growth shown by insect (1mk)

b) How do insects overcome the limitation so that growth occurs after all 1mk)

15. What are the structural units of lipids? (2mks)

16. State the importance of the following features in gaseous exchange (2mks)

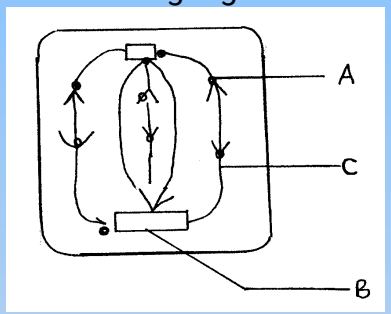
a) Presence of cartilage in trachea and bronchi

b) Alveoli, gill filaments, tracheoles being numerous in the respective organisms where they occur

17. a) State the major factor in the 'Global warming' experienced in the world today (1mk)

b) Suggest two ways of reducing the Global warming (2mks)

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

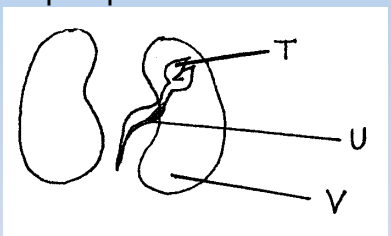


i) Name the stage of mitosis it represents (1mk)

ii) Name the structures A (1mk)

C (1mk)

19. The diagram shows a bean seed split open.



a) Label the parts

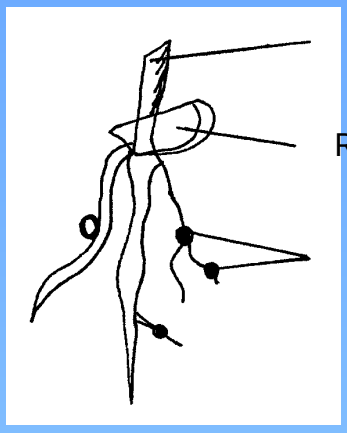
b) Of what importance is structure U to the bean plant? (2mks)

20. 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 (3mks)

Habitat	Nitrogenous waste
Terrestrial	

Fresh water	
Marine	

21. a) Name the organism that causes malaria (1mk)
    b) Name two ways of preventing this disease (2mks)
22. Explain what will happen if Rh^+ blood is transfused into a recipient of Rh^- blood. (2mks)
23. Shown below is a section of a leguminous plant uprooted from a school farm. Study it carefully and use it to answer questions that follow.



    a) State the micro-organism found in the nodules (1mk)
    b) State the importance of the micro-organism to the soil. (1mk)
24. State the role of the following in Homeostasis
    i) ADH (1mk)
    ii) Aldosterone (1mk)
25. What is meant by the term natural selection (3mks)
26. What is the role of corpus luteum
    i) Menstrual cycle (2mks
    ii) Early pregnancy (2mks)
27. State two adaptations of herbivores which enable them to digest cellulose(2mks)
28. What is meant by:
    a) Organic evolution (2mks)
    b) Adaptive radiation (2mks)
29. Explain would happen if a person slept in a poorly ventilated room with a burning jiko (3mks)

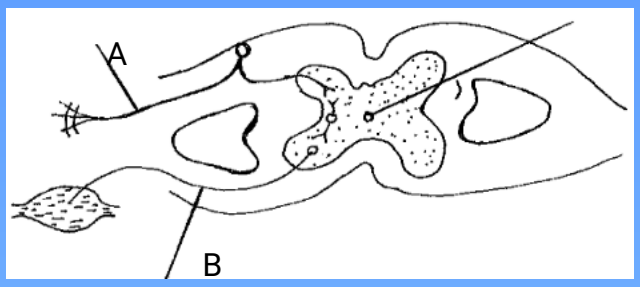
BAHATI GIRLS KCSE TRIAL AND PRACTICE EXAM.

Paper 2

SECTION A: (40MARKS)

1. a) State three structural differences between arteries and veins (3mks)
    b) List two factors that aid in blood flow through the veins (2mks)
    c) Name the proteins in the blood which are responsible for determining the blood group of a person (2mks)
    d) In a certain person, blood took long time to clot after a cut. What vitamin deficiency was the person likely to have been suffering from? (1mk)
2. a) What is carbon dioxide fixation in photosynthesis? (3mks)
    b) Explain how oxygen is formed in the process of photosynthesis (4mks)
    c) Other than carbon (IV) oxide, name another raw material for photosynthesis (1mk)
3. Below is a cross section of the human spinal cord.

C



a) Name the parts labeled A and B (2mks)
b) State the function of the part labeled C (1mk)
c) Describe the reflex arc when a bare footed man steps on a sharp pin (5mks)

4. a) Name two disorders in humans caused by gene mutations (2mks)
b) What is meant by the term allele? (1mk)
c) In a particular species of tropical beetle, the wings had either red or orange marks. A cross between a red marked beetle with orange marked beetle produces offsprings with yellow marks only. When F1 offsprings were selfed, they produced F2 generation in the ratio of 1 red : 2 yellow : 1 orange
i) Explain the absence of red and orange marks in F1 offspring's (1mk)
ii) Using a punnet square, show how the F2 generation was crossed. (Use letters R for red marks and W for Orange marks) (4mks)

5. a) Describe the three characteristics of a population (3mks)
b) The table below gives information about an aquarium community which is ecologically balanced.

Type of organism	Weight in grams
Insect larvae	500g
Fishes	1,200g
Water Plants	5000g
Bacteria	10g

i) What do you understand by the term ecological balanced? (1mk)
ii) Construct a pyramid of biomass from the above data (3mks)
iii) Briefly describe the shape of the pyramid of biomass (1mk)

SECTION B (40 MARKS)

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

6. The table below shows the rate of enzyme activity at different pH values.

pH	Rate of Product formation (mg/hr)
1	8.0
2	10.0
3	10.0
4	6.0
5	3.3
6	2.0
7	1.0
8	0.3
9	0.0
10	0.0

a) Using a suitable scale, draw a graph of the rate of product formation against pH (6mks)

b) Account for the rate of product formation between

i) pH 1 and 3 (2mks)

ii) pH 5 and 8 (2ms)

iii) pH 9 and 10 (2mks)

c) What is the optimum pH value for this enzyme (1mk)

d Suppose this enzyme is a digestive in what part of the alimentary canal would it be found (1mk)

i) Give a reason for your answer (2mks)

e) Apart from the pH, state four other factors that may affect the rate of enzyme activities (4mks)

7. a) Describe how insect pollinated flowers are adapted to pollination (10mks)

b) Explain how seeds and fruits are adapted to wind and animal dispersal (10mks)

8. Explain how a finned fish is adapted to locomotion in water (20mks)

AND PRACTICE EXAM .

231/1
BIOLOGY
THEORY
Paper 1
2 Hours

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1. The table below shows the concentration of some ions in pond water and in the cell sap of an aquatic plant growing in the pond.

Ions	concentration in pond Water (parts per million)	concentration in cell sap (parts per million)
Sodium	50	30
Potassium	2	150
Calcium	1.5	1
Chloride	180	200

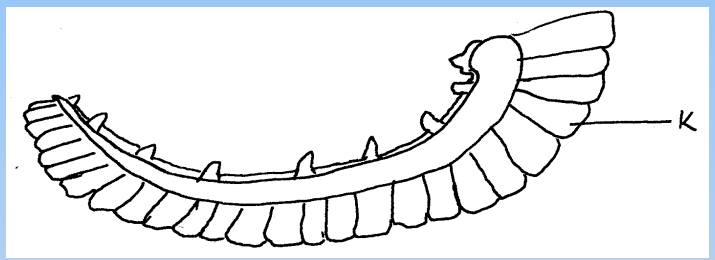
a) Name the process by which potassium ions could have been taken by this plant. (1mk)

b) State **one** condition necessary for the process named in (a) above to take place. (1mk)

2. a) A student was viewing a slide preparation of a cheek cell under high power of a microscope. The features of the cell were blurred. Name the part of the microscope that the student would use to obtain a sharper outline of the features. (1mk)

b) Give the formula used to calculate magnification in light microscope. (1mk)

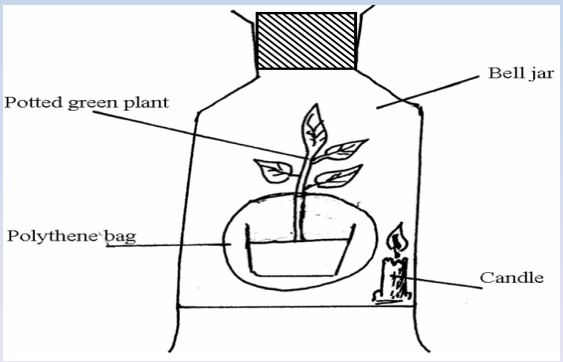
3. The diagram below represents an organ from a bony fish. Study the diagram and answer the questions that follow.



a) Name the organ. (1mk)

b) State **three** ways in which part K is adapted to its function. (3mks)

4. A student investigating an aspect of photosynthesis set up an experiment as shown in the diagram below.



The bell jar was made air tight. After some time the candle went off. The student then placed the set-up in direct sunlight for 5 hours.

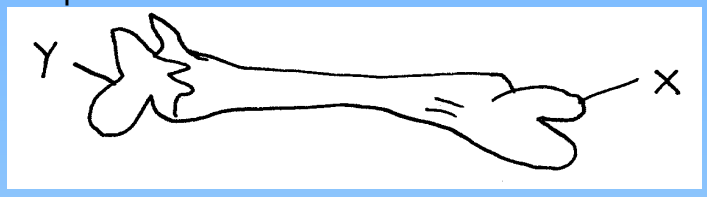
a) Give a reason why the burning candle was inclined. (1mk)

b) Suggest a reason why it was necessary to cover the pot with polythene bag(1mk)

5. Explain how sunken stomata lower the rate of transpiration. (2mks)
6. State **three** functions of mammalian blood other than transport of substances. (3mks)
7. State **three** ways in which the ileum is structurally adapted to the absorption of digested food. (3mks)
8. State how mitochondria is adapted to its function. (2mks)
9. State how xylem is adapted to its function. (3mks)
10. State functional differences between arteries and veins. (2mks)

Arteries	Veins

11. What is oxygen debt? (2mks)
12. What is the importance of sebaceous glands in the human skin? (2mks)
13. Name the hormones responsible for the regulation of blood sugar level. (2mks)
14. The diagram below represents a mammalian bone.

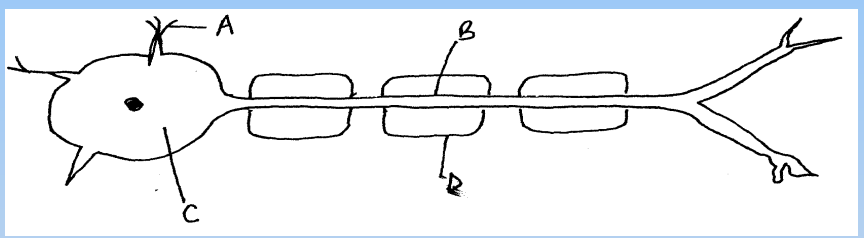


a) Identify the bone. (1mk)

b) Name part labeled Y (1mk)

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

15.



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

b) State the functions of part labeled B and D. (2mks)

16. In guinea pig, there are two alleles for hair colour, black and white. In a breeding experiment, all the F1 phenotypes produced from a cross between pure-breeding black-haired and pure-breeding white-haired parent had black hair.
(Use letter B to represent gene for hair colour)

a) What is an allele (1mk)

b) Work out the phenotypic ration of the F2 generation. (4mks)

17. Name parts of brain which control:

a) Involuntary activities eg. Breathing (1mk)

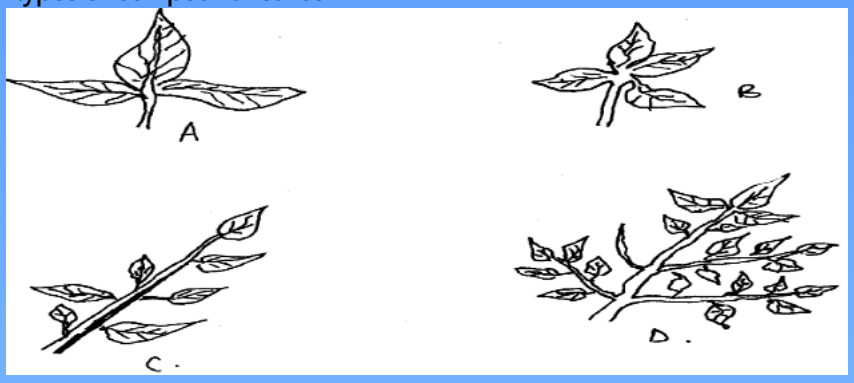
b) Control voluntary body movements. (1mk)

18. Define the following terms: (2mks)

i) Cephalothorax

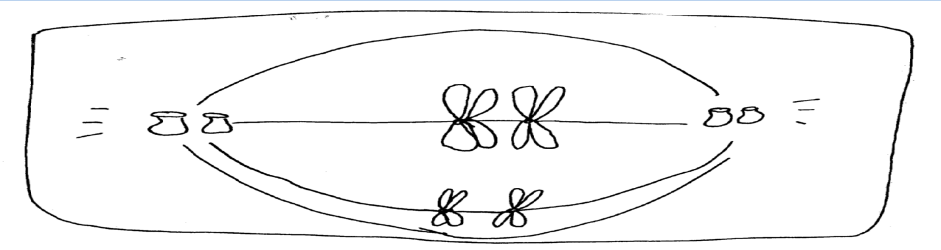
ii) Eukaryotes

19. Below are four types of compound leaves



Identify the four types of compound leaves. (4mks)

20. To estimate the population of grasshoppers in Kogelo village 400 grasshoppers were caught, which were marked and released. After 24 hours 200 grasshoppers were caught out, of which 80 had been marked.
    a) Suggest the possible instrument that may have been used for capturing the grasshoppers. (1mk)
    b) Estimate the population size of the grasshoppers in the village. (2mks)
21. Explain how the following features assist in adapting xerophytes to their habitat. (2mks)
    i) Folded leaves
    ii) Leaves modified to spines
22. State the changes that occur in a nerve axon to produce an action potential(3mks)
23. Industrial wastes may contain metallic pollutants. State how such pollutants may indirectly reach and accumulate in the human body if the wastes were dumped into rivers. (3mks)
24. Name the causative agent of cholera. (1mk)
25. What is double fertilization in flowering plants. (2mks)
26. a) During implantation in a mammal, the blastocyst differentiates into 3 layers, which are: (3mks)
    b) Which of the layers named in (a) above normally differentiates to form the placenta. (1mk)
27. State **four** ways of breaking dormancy in a seed. (4mks)
28. a) Name the hormone responsible for metamorphosis during larval stage of an insect. (1mk)
    b) State the source of the hormone. (1mk)
29. Below is a stage of cell division.



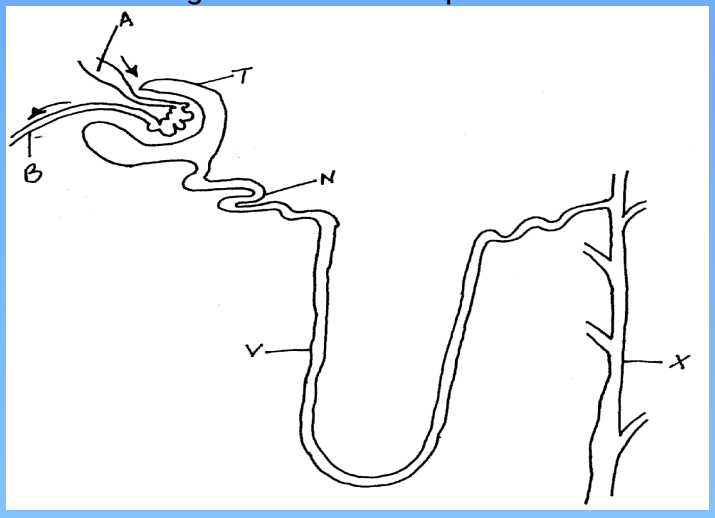
    a) Identify the stage. (1mk)
    b) Give reasons for your answer in (a) above. (2mks)
30. State structural difference between sclerenchyma and colenchyma tissues(2mks)

Sclerenchyma	Colenchyma

SECTION A (40 MARKS)

Answer ALL questions in this section in the spaces provided.

1. Shown below is a section through the mammalian nephron.



a) Name the structures labeled:- (2mks)

b) Name **all** structures in a nephron which are normally present in the cortex region of kidney. (1mk)

c) Which region in the Nephron deals with conservation of body water (1mk)

d) Name **one** hormone that has an effect on part labelled X. (1mk)

e) How is part labeled N adapted to its function. (3mks)

2. a) In a certain family with two children, one child is blood group B while the other one is blood group O. Work out the genotype of the two children if the mother is blood group A and father group B. (4mks)

b) What would be the phenotypic ration of the F_1 generation? (1mk)

c) What is haemolytic disease of the new-born (Erythroblastosis foetalis) (3mks)

3. a) State **two** limitations of using fossil records as evidence of evolution. (2mks)

b) What is the significance of isolating mechanisms in the process of evolution(3mks)

c) Describe geographical distribution as an evidence of evolution. (3mks)

4. The results in the table below shows the effects of some conditions for seed germination. In each experiment, all other environmental conditions were kept constant, except for the one being investigated.

Experiment	Treatment	% germination
I	- Seeds placed in tightly closed container with pyrogallic acid.	0
II	i) Seeds kept in source of light. ii) Seeds kept in dark cupboard	96 97
III	i) Seeds kept in a refrigerator at 4^0C ii) Seeds kept in an oven at 60^0C iii) Seeds kept at 35^0C	0.5 0 92
IV	i) Dry seeds in closed containers ii) Moist seeds in closed container	0 87

a) i) What was the purpose of pyrogallic acid in experiment (i) (1mk)

ii) State the aim of the experiment (ii) (1mk)

b) i) Account for the results obtained in experiment set-up (iii). (3mks)

ii) State why 100% germination was not achieved in experiment (iv) (ii(1mk)

c) Of what biological significance is the condition necessary for germination been investigated by experiment (iv). (2mks)

5. A student obtained a castor oil petiole, measuring 4cm long, which was split half way to obtain 4 flaps. The two pieces were then placed in solutions of different concentrations in a beaker, for 10 minutes. The appearance after 10 minutes is as shown.



Piece in A **Piece in B**

a) Account for the appearance of the pieces in solutions A and B (6mks)

b) State the significance of the biological process involved in the experiment. (2mks)

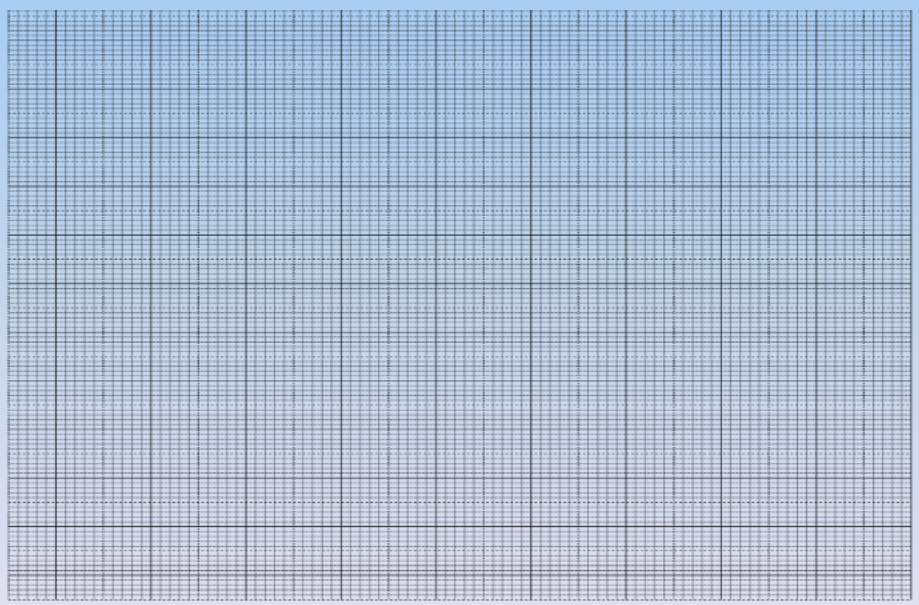
SECTION B (40 MARKS)

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

6. The data below was obtained from an experiment designed to measure the velocity of flow of water during the course of a single day in the xylem of two trees of the same species.

Time of day/hr		0300	0600	0900	1200	1500	1800	2100	2400	0300	0600
Velocity of flow/cm hr^{-1}	Eucalyptus species	0	45	125	140	135	85	45	25	5	0
	Acacia species	-	5	105	135	110	45	30	25	10	0

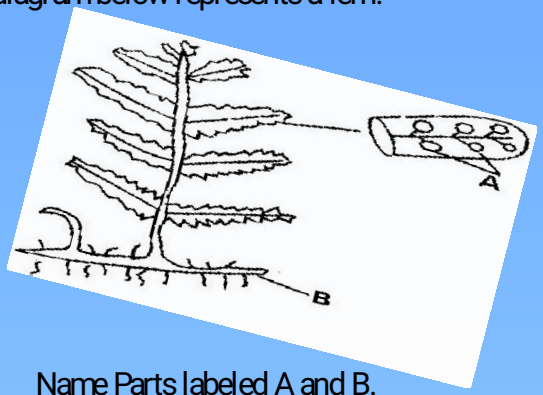
a) Using the same axes, draw graphs to show the velocity of flow against time. (8mks)



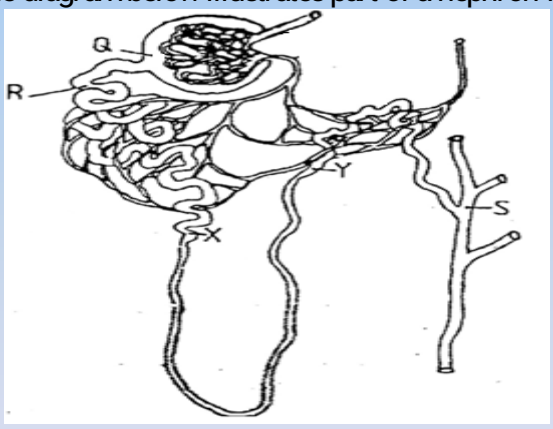
231/1
BIOLOGY
Theory
2: hours

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1. Name the tissues whose cells are thickened with:
   a) Cellulose and pectin. (1mk)
   b) Lignin. (1mk)
2. The diagram below represents a fern.



   (a) Name Parts labeled A and B. (2mk)
   (b) To which division does the plant belong? (1Mk()
3. State three measures that can be taken to control infection of man by protozoan parasites (3mk)
4. Explain how the following factors hinder self pollination in plants:
   (i) Protogyny (1mk)
   (ii) Dioecism (1mk)
5. Explain the likely effect on humans and other organisms of untreated sewage discharged into water body that supplies water for domestic use. (3mk)
6. Name two structures in herbaceous stems that enhance their support. (2mk)
7. a) Define the term immunity. (1mk)
   b) Distinguish between natural immunity and acquired immunity. (1mk)
   c) Identify one immunizable disease in Kenya. (1mk)
8. State three differences between osmosis and active transport. (3mk)
9. The diagram below illustrates part of a nephron from a mammalian kidney.



   a) Name the fluid found in the part labeled Q. (1mk)
   b) Identify the process responsible for the formation of the fluid named in (a) above. (1mk)

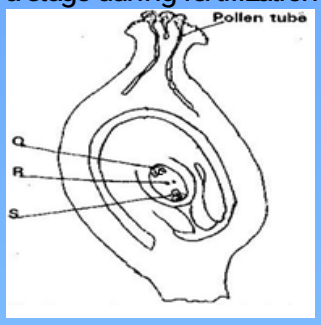
   c) Which two hormones exert their effect in the nephron? (2mk)
   State three characteristics of members of kingdom Monera that are not

found in other kingdoms. 3mks

10.

11. What is meant by the following biological terms?
    i) Crenation (1mk)
    ii) Haemolysis (1mk)
    iii) Plasmolysis (1mk)

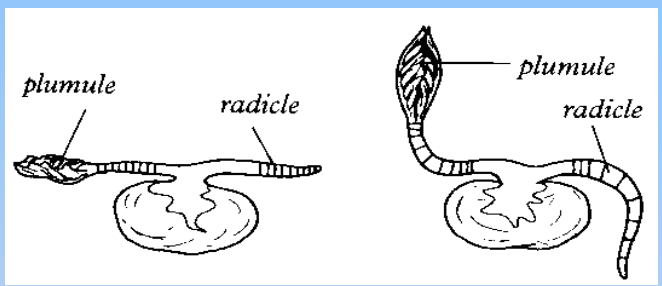
12. The diagram below shows a stage during fertilization in flowering plant.



    a) Name the parts labeled Q, R, and S. (3 mk)
    b) State the function of the pollen tube. (1 mk)

13. a) State the major factor in the 'Global warming' experienced in the world today. (1mk)
    b) Suggest two ways of reducing the Global warming. (2mk)

14. An experiment was set to investigate a certain aspect of response. A seedling was put on a horizontal position as shown in figure M below. After 24 hours, the set up was as shown in figure N.



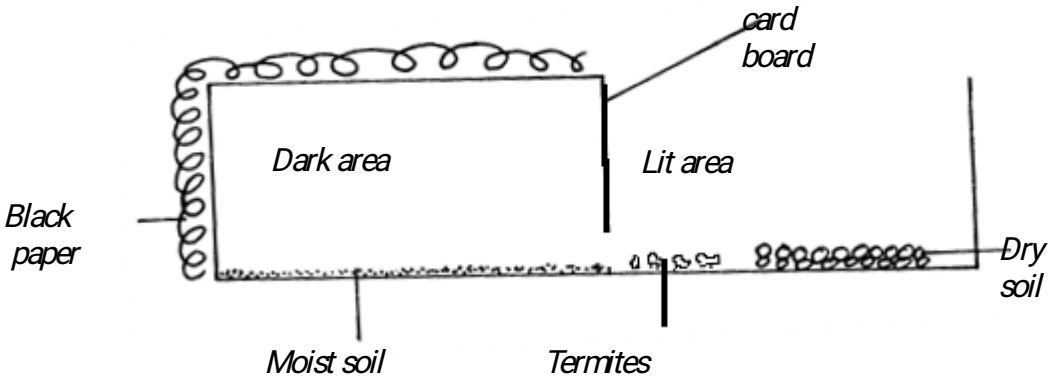
M N

    a) Name the response exhibited. (1mk)
    b) Explain the curvature of the shoot upwards. (3mk)

15. The paddles of whales and the fins of fish adapt these organisms to aquatic habitats.
    a) Name the evolutionary process that may have given rise to these structures. (1mk)
    b) What is the name given to such structures? (1mk)
    c) Give two examples of vestigial organs in man. (2mk)

16. a) Name a protein and vitamin involved in blood clotting.
    i) Protein. (1mk)
    ii) Vitamin (1mk)
    b) Explain why blood is not normally used for transfusion after one month. (1mk)

17. A group of Form four students set up an experiment to investigate a biological process using termites. They used a small box in which a portion was covered with black paper and had moist soil. The open part had dry soil. Termites were placed inside in open area of the box.



a) Predict what happened to the termites after 30 minutes. (1mk)

b) What form of response is exhibited by termites? (1mk)

c) State one biological significance of the above response to termites. (1mk)

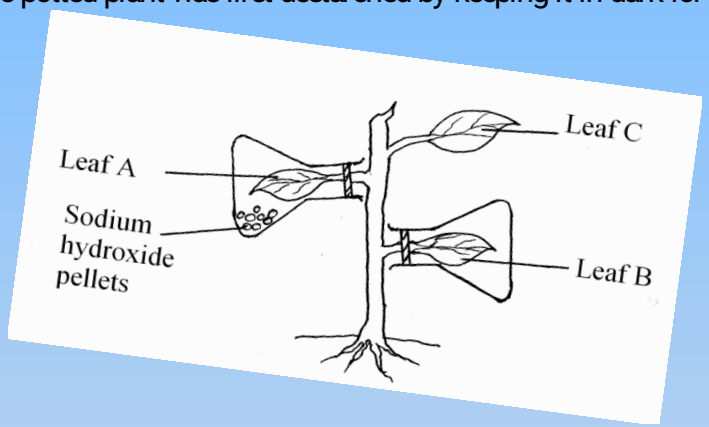
18.) Name two fins in a bony fish which perform the following functions:-

i) Changing direction. (1mk

ii) Control pitching. (1mk)

(b) State the role of myotomes in fish. (1mk)

19. The diagram below represents an experimental set up to investigate a certain scientific concept. The potted plant was first destarched by keeping it in dark for four days.



The set up was then placed in sunlight for five hours and leaves were tested for starch.

a) What scientific concept was being investigated? (1

b) i) Give the results likely to be obtained after starch test for A and B. A and B.

ii) Account for the results in leaf A in b (i) above. (1mk)

c) Why was leaf C included in the set-up? (1mk)

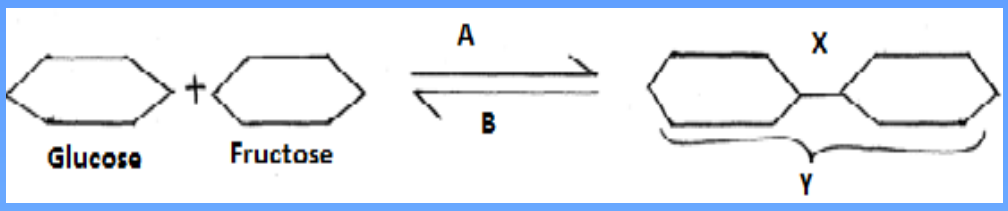
20. a) Explain the importance of transport in plants. (2mk)

b) What is the role of root hairs in plants? (1mk)

21. a) Identify the source of urea that is removed via the kidneys in a healthy human being.

b) Explain why a pregnant woman excretes less urea compared to a woman who is non- pregnant. (2mk)

Study the reaction below and answer the questions that follow.



a) What biological processes are represented by A and B? (2mk)
b) Identify the product Y. (1mk)
c) State the bond represented by X. (1mk

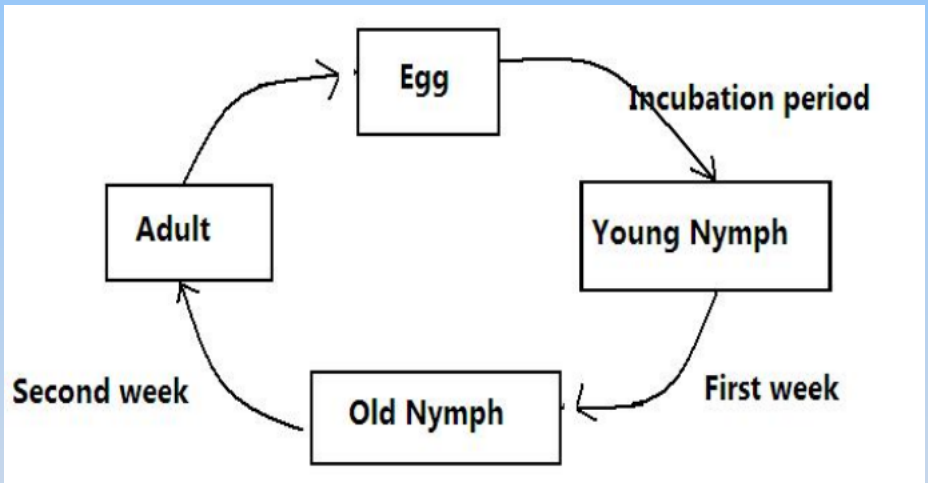
22. .Explain the events of the light stage of photosynthesis. (3mk)
23. Explain what happens in humans when the concentration of glucose in the blood rises above the normal level. (3mk)
a) Outline the main features of Lamarckian theory of evolution. (2mk)
b) In view of modern genetics, explain why Lamarck's theory is unacceptable. (1mk)
c) Name one factor in nature that increases the process of evolution. (1mk)

SACHO HIGH SCHOOL KCSE TRIAL AND PRACTICE EXAM .

Paper 2

SECTION A (40 MARKS)

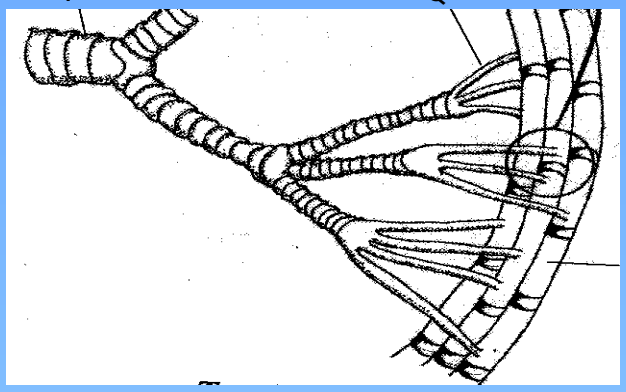
1. The diagram below shows a life cycle of a cockroach



(a) **Name** the hormone that would be at high concentration during the first and second week and their functions.
(i) First week (2mks)
Hormone
Function
(ii) Second week (2mks)
Hormone
Function
(b) **Name** the structure that produces hormone named in a (ii) above (1mk)
c) Name the process represented by the life cycle above (1mk)
d) State two importance for the process named in (c) above (2mks)

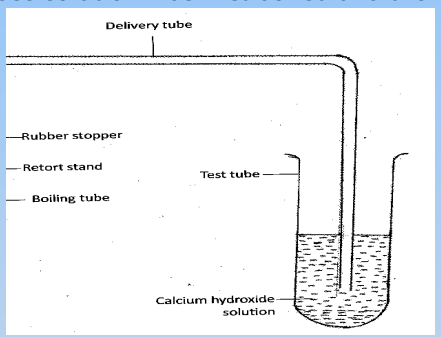
2. The diagram below represents part of a geasous system in a grasshopper.

P Q



a) Name the structures labeled P and Q
b) State the function of the structure labeled P (1mk)
c) Describe the path taken by carbon (IV) oxide from the tissues of the insect the atmosphere (3mks)
d) How is the structure labeled Q adapted to its functions (2mks)

3. The set up below illustrates an experiment to demonstrate a certain biological process, before the addition of the yeast suspension the glucose solution was first boiled and then cooled at 40°C.



a) What was the aim of the experiment? (1mk)
b) What observations would you make in the tubes a few minutes after the experiment begun (2mks)
c) Explain the observations made in (b) above (2mks)
d) Why was glucose solution boiled before cooling at 40°C (1mk)
e) How can you set up a control experiment for the above (1mk)

4. The following are short messages (sms) on cell phone communication between Mrs. Mkenzie and her husband. They can be used as analogies of gene mutation

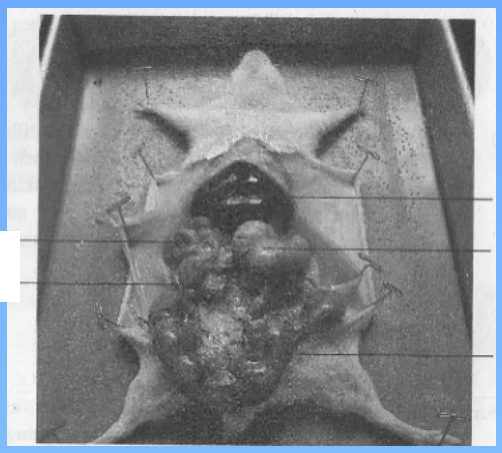
	Intentended message	Actual message
1.	I want a drive	I want a driver
2.	Yesterday was my shopping day	Yesterday was my hopping day
3	My skirt was stolen	My shirt was stolen
4	Tommorrow I will be visiting my team	Tommorow I will be visitng my mate

a) For each of these messages identify the type of gene mutation illustrated (4mks)
b) State one example of chromosomal mutation that lead to

i) Change in chromosome structure (1mk)
ii) Change in chromosomal number (1mk)

c) Explain why genetic counseling is termed as one practical application of genetics (2mks)

5. The following is a photograph of s dissected mammal. Study the photograph and answer the questions that follows

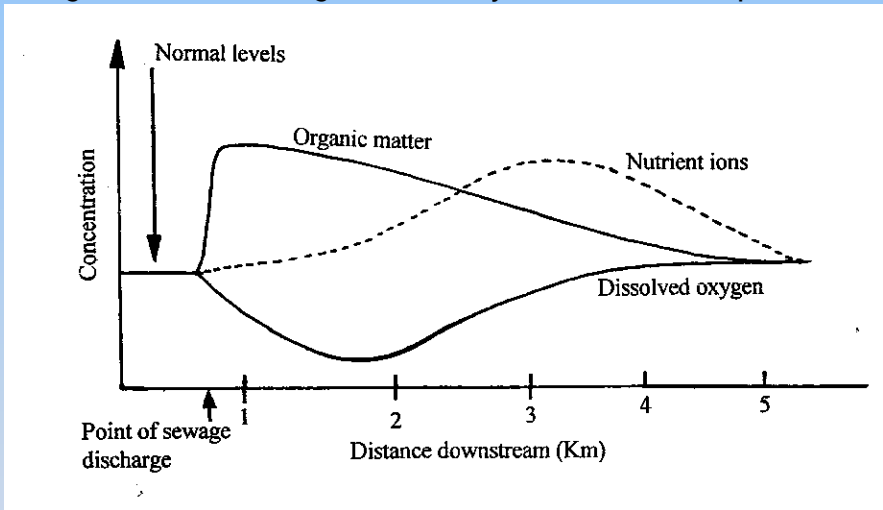


a) Name the structures labeled R,S and T (3mks)
b) On the photograph, label and name the site of production of vitamin K (1mk)
c) State one function of the following parts (2mks)
d) i) State the sex of the dissected mammal (1mk)

SECTION B (40 MARKS)

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

6. The figure below shows the changes in the concentration of various substances in a river following the discharge of untreated sewage into it. Study it and answer the questions that follow



a) Account for the changes in the concentration of:
i) Organic matter (3mks)
ii) Nutrient ions (2mks)
iii) Dissolved oxygen (4mks)
b) Describe the changes you would expect to observe with respect to:
i) Fish population (3mks)
ii) Water plants and photosynthetic algae (4mks)
c) State four ways of controlling the type of pollution illustratted above (4mks)

7. Describe how the following types of plants are adapted to their habitats:
a) Mesophytes (10mks)

b) Halophytes (5mks)
c) Hydrophytes (5mks)

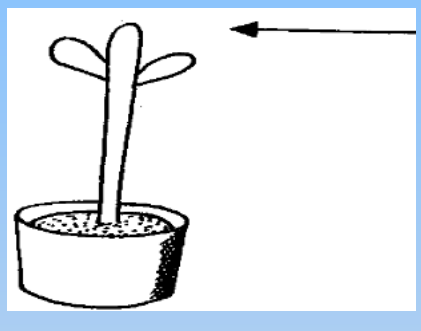
8. Discuss the adaptations of the human eye to its functions (20mks)

STRATHMORE SCHOOL KCSE TRIAL AND PRACTICE EXAM .

231/1
BIOLOGY
PAPER 1
(THEORY)
TIME: 2 HOURS

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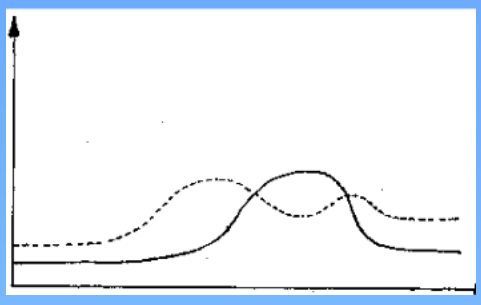
1. The scientific name for French bean is *Pharseolus vulgaris*
   (a) What taxon does the term Phaseolus represents? (1 mark)
   (b) State **two** rules that are followed when giving a scientific name to an organism. (2 marks)
2. a) What is the function of the mirror in the microscope? (1 mark)
   b) Which organelle would be abundant in: Skeletal muscle cell (1 mark)
   Palisade cell (1 mark)
3. A seedling shoot was exposed to unidirectional light as shown below. The set up was left in the dark room for three days.



   i) Make a drawing of the expected results at the end of the experiment. (2 marks)
   ii) Explain the expected results at the end of experiment. (2 marks)
4. State **two** advantages of breathing through the nose than through the mouth. (2 marks)
5. Name **two** mineral elements required in the synthesis of chlorophyll. (2 marks)
6. a) State **two** environmental condition that can cause seed dormancy. (2 marks)
   b) Name the part of the leaf that elongates to bring about epigeal germination. (1 mark)
7. a) State the function of amylase in human body. (1 mark)
   b) Name **two** parts of the alimentary canal where amylase is secreted. (2 marks)
8. a) Name **two** photochemical cells in human retina. (1 mark)
   b) Name **one** chemical substance and two mineral ions involved in impulse transmission in mammals. (2 marks)
9. Give the function of melanin pigment produced in the skin of man. (1 mark)
10. What is the importance of saprophytic bacteria in an ecosystem? (1 mark)
11. A student while carrying out an experiment observed 8 cells across the field of view of light microscope. If the diameter of the field of view is 5 mm, calculate the average length of each cell in micrometers. (2 marks)
12. State **one** feature present in the flowers that can be used to distinguish between a monocotyledonous flower and dicotyledonous flower. (1 mark)
13. The graph below shows levels of oestrogens and progesterone during the human menstrual

cycle.

a) Mark on the graph the curve that represents



i) Progesterone
ii) Oestrogen

b) Which is the most likely day of ovulation from the graph? (1 mark)

14. a) What are fossils? (1 mark)

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

i) Grasshopper (1 mark)

ii) Sheep (1 mark)

16. Name the type of response shown by;

a) Leaves of *Mimosa pudica* when they fold after being touched. (1 mark)

b) Sperms when they swim towards ovum (1 mark)

c) Euglena when they swim towards the source of light. (1 mark)

17 a) Give an example of sex linked trait on x-chromosome. (1 mark)

b) Below is a nucleotide strand. (1 mark)

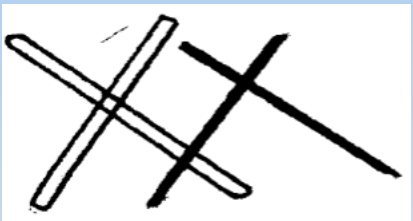
A	A	G	T	C

i) Identify the type of nucleoic acid strand. (1 mark)

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

iii) Write down the complimentary base sequence in the other strand. (1 mark)

18. The diagram below shows a stage in cell division



i) Name the stage of the cell division that exhibits the process above. (1 mark)

ii) What is the significance of the phenomenon shown to a species? (1 mark)

19. Differentiate between respiration and respiratory surface. (2 marks)

20. State **two** adaptations of skin of the frog to gaseous exchange. (2 marks)

a) A man's urine gave a positive reaction with Benedict's solution. Name the disease he was suffering from. (1 mark)

b) State **two** ways in which the symptoms of the condition in (a) can be controlled. (2 marks)

22. A student collected an organism in the school compound and noted it had a segmented body and two pairs of legs per body segment.

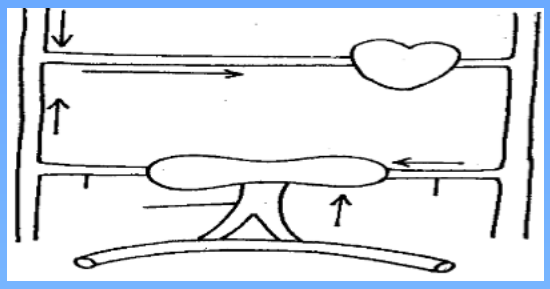
i) Name the class to which the organism belongs. (1 mark)

ii) State **two** other features the student may have observed. (2 marks)

23 a) Name **two** structures of gaseous exchange in aquatic plants. (2 marks)

b) What is the effect of contraction of the diaphragm muscles during breathing in mammals? (2 marks)

24. The diagram below represents part of the mammalian blood circulatory system and some associated glands.



(a) Name the blood vessels **A** and **B** (2 marks)

(b) State **two** structural differences between the blood vessels labelled **A** and **C** (2 marks)

25. A student made equidistant marks on a radical of a dicotyledonous seedling. After three days the distance between the marks was measured.

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

b) Predict the results that were likely to be obtained by the student (2 marks)

26. a) Name the disease caused by H.I.V (1 mark)

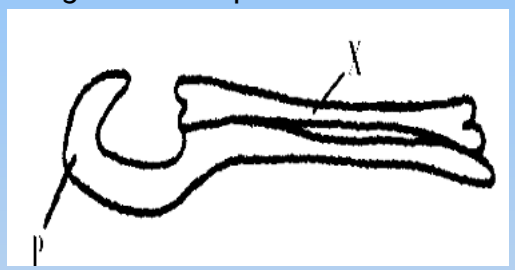
b) Give **two** reason why it is difficult to cure the disease named above. (2 marks)

c) Give **one** preventive measure of the named disease. (1 mark)

27. Plants of a particular species grown in certain habitat flower at the same time. What is the importance of this adaptation (1 mark)

28. State **two** roles played by the bark in plants (2 marks)

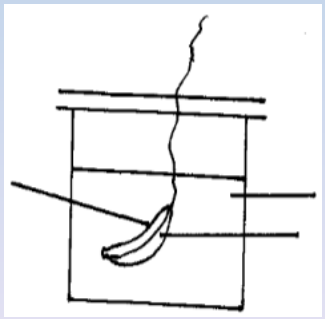
29. The diagram below represents a bone obtained from a mammal.



i) Name bone labelled **X.** (1 mark)

ii) Name structure **P.** (1 mark)

30. A student mashed a piece of ripe banana and made it into paste by adding water, place the paste in a visking tubing and suspended it in a beaker containing iodine solution as shown below. The set up was left for 40 minutes.



a) State the physiological process under investigation. (1 mark)

b) Account for the result obtained in the table. (2 marks)

31. Industrial waste may contain metallic pollutants. Explain how the pollutants may indirectly reach

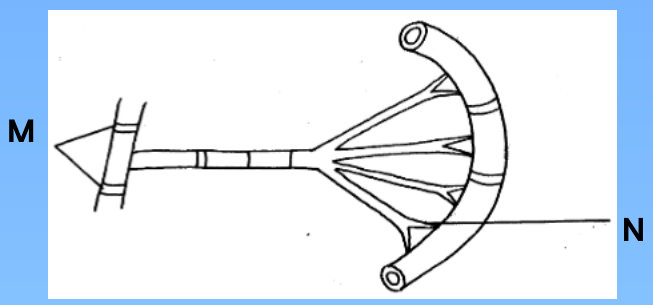
and accumulate in the human body when the wastes are dumped into rivers
(2 marks)

32. During oxidation of certain foods substances the respiratory quotient was found to be 0.718.
i) Name the type of food substance being oxidized. (1 mark)
ii) State **two** advantages of using the food substances named. (2 marks)

STRATHMORE SCHOOL KCSE TRIAL AND PRACTICE EXAM .

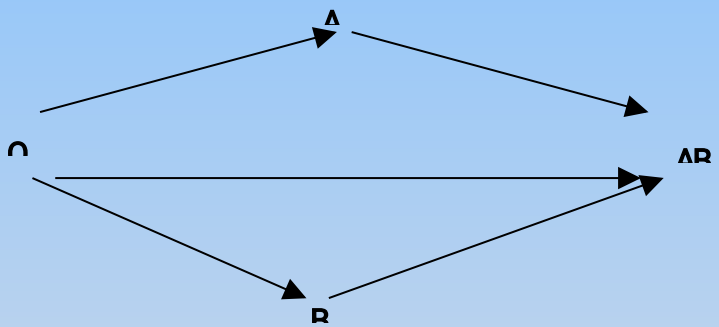
Paper 2

1. The diagram below represents part of a cockroach gaseous exchange system.



a) State the function of the part labelled **M** (1 mark)
b) Suggest how the part M is adapted to the gaseous exchange function (3 marks)
c) How does the movement of oxygen in an insect and mammals from atmosphere to the tissue of its body differ (4marks)

2. The following chart below shows blood transfusion pathway

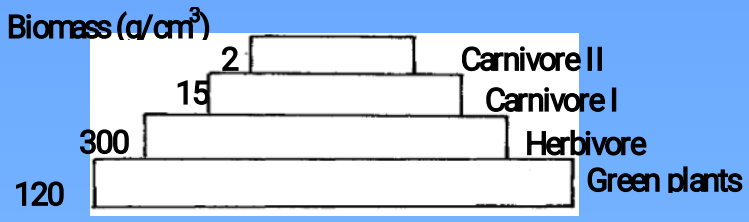


a) What **five** conclusions can you draw from the flow chart (5marks)
b) Why is the knowledge of blood groups necessary before blood transfusion?
(1 mark)
c) A part from knowledge of blood groups, state two precautions that must be observed during blood transfusion (2 marks)

3. The genetic disorder haemophilia is due to a recessive sex linked gene. A man who is haemophiliac married a woman who is a carrier for the condition.
a) Using letter (H) to represent normal condition and (h) to represent haemophiliac condition.
i) What is the genotype of the man and the woman? (2 marks)
Man
woman
ii) Work out across between the man and the woman (3marks)
b) What is the chances that both the first and the second sons will be haemophiliac?
(2 marks)

c) Haemophilia is most common in the males than females humans. Explain. (1 mark)

4. The diagram below shows different groups of organisms and their biomass.



a) Define the term biomass (2 marks)

b) Account for the decrease in biomass in the successive group of organisms (3 marks)

c) Describe how energy from the sun is made available for carnivore II (3 marks)

5. Cell of a certain herbaceous plant were found to have an average diameter of 2.5μm the cells were put in varying concentrations of salt solutions. The average diameter of the cells in each solution was determined and the results were recorder as shown in the table below.

Concentration of salt solution %	Diameter of cells. μ m
1	5.0
5	4.0
10	3.0
15	2.0

a) From the results above, determine the cell sap concentration (1 mark)

b) Give an explanation for the average diameter of the cells placed in the following salt concentration compared to the normal diameter of the cells.

i) 1 % salt solution (3 marks)

ii) 15 % salt solution (3 marks)

Give the term used to describe salt solution whose concentration is the same as cell sap. (1 mark)

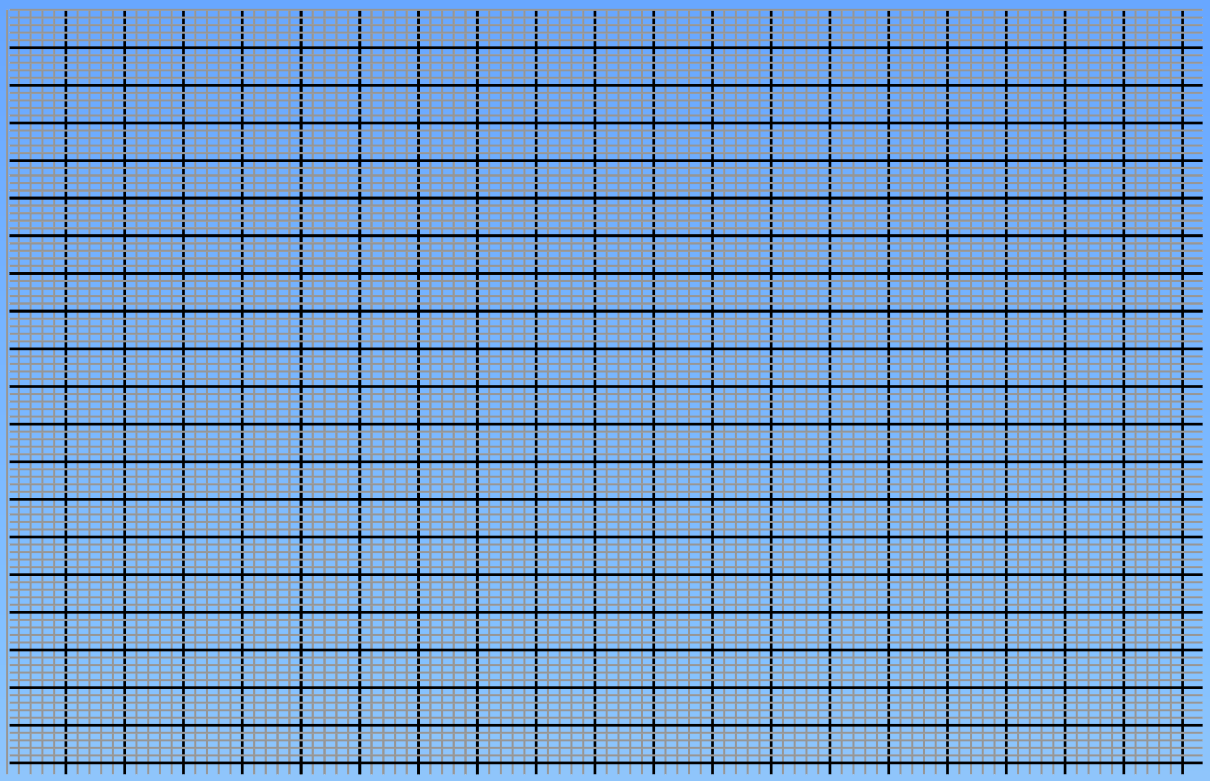
SECTION B (40 .MARKS)

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

6. In the experiment, the population growth of yeast cells in a Petri dish was determined over a period of 75 minutes. The results below were obtained.

Time in minutes	Number of yeast cells
0	4
5	6
10	8
15	10
25	30
30	50
35	80
40	120
45	140
50	150
55	160
65	166
75	166

a) Using a suitable scale, plot a graph of number of cells against time in minutes (6 marks)



b) Name the type of the curve you have drawn above (1 mark)

c) Determine the number of yeast cells after 37 minutes (1 mark)

d) After how long was the population of yeast cells 144? (1 mark)

e) Work out the rate of cell division between 32 minute and 42 minute (2 marks)

f) Account for the shape of graph between 45th minute and 60th minute (3 marks)

g) In a field study to estimate the population of grasshoppers in the school field of 4 km^2, 60 grasshoppers were caught using sweep nets, marked with red paint and released back to the field. The following day students went back with their sweep nets and caught 100 grasshoppers, in which 20 were found to be already marked.

i) Calculate the population size of grasshoppers in the field (2 marks)

ii) Calculate the population density of the grasshoppers in the field (2 marks)

iii) What factors would maintain the population of grasshoppers and yeast cells at the carrying capacity. (2 marks)

7. Describe the various evidences to support organic evolution (20 marks)

8. a) Describe how the heart beat is controlled and maintained (10 marks)

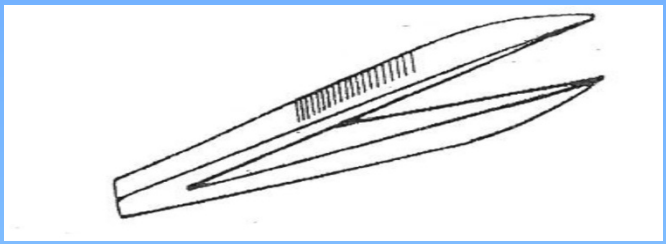
b) Describe the structure and function of thrombocytes (10 marks)

ALLIANCE GIRLS SCHOOL KCSE TRIAL AND PRACTICE EXAM.

231/1
BIOLOGY
PAPER 1
TIME: 2 HOURS

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1. Identify the following apparatus and state its functions.

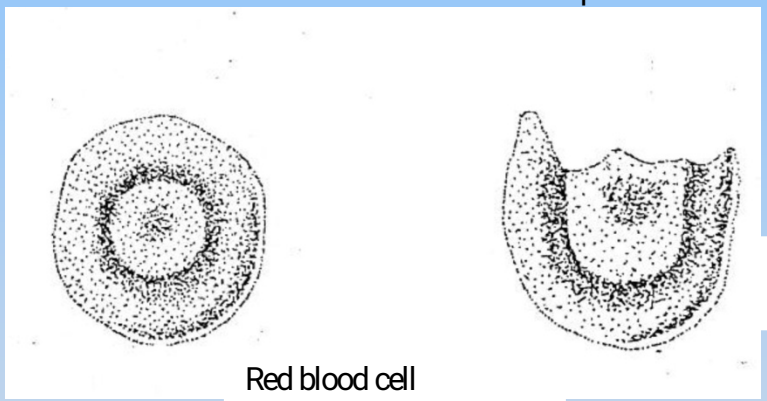


(i) Name (1mark)
(ii) Function (1mark)

2. A student measured the length of a mitochondrion on a photomicrograph whose magnification was X 40000 and found it to be 1mm. Calculate the actual size of the mitochondrion. (3 marks)

3. (a) Name the kingdom whose members have a cell wall made of chitin (2mark)
(b) Besides the abdomen, name the other body part of the members of arachnida (1mark)
(c) State two main characteristic features of members of division Bryophyta (2 marks)

4 A form one student obtained the results below in an experiment



Red blood cell
At start of experiment

Red blood cell
At end of experiment

(a) Identify the physiological process under investigation. (1mark)
(b) Account for the result obtained (3marks)

5 (a) The diagram below illustrates the flow of blood in a certain organism. By use of arrows, show the direction of blood flow. (1mark)



b) Identify structure X .(1mark)

c) State 2 functions of haemolymph (2marks)

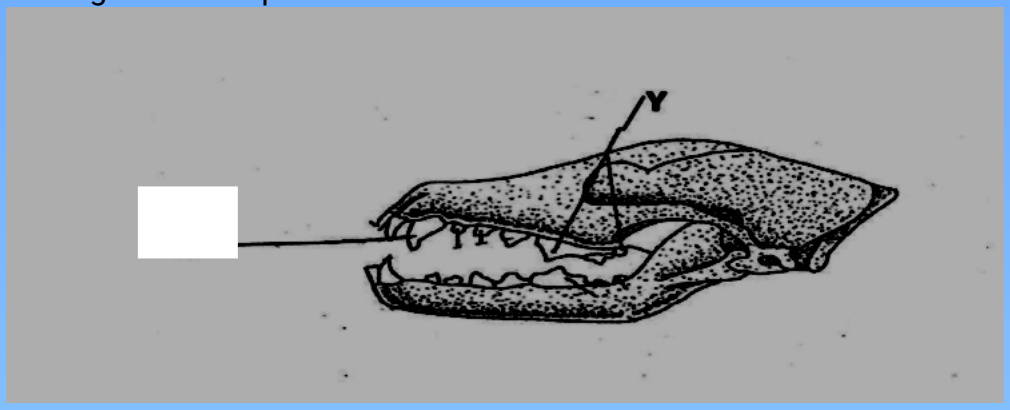
6 A certain species of flowering plants relies entirely on sexual reproduction for propagation. The chromosome number of its Ovary tissue is 16. Predict the chromosome number in

(a) (i) Male nucleus (1mark)

(ii)A cell of the endosperm (1mark)

(b) How does the male nuclei reach the ovule after pollination (2marks)

7 The diagram below represents dentition formula of a certain animal



Identify the parts labeled **X** and **Y** giving a function for each

X

Function .(2marks)

Y

Function 2marks)

8 State **THREE** causes of seed dormancy (3marks)

9 (a)(i) Name the principal site of gaseous exchange in the lungs of humans (1mark)

(ii) State 2 ways in which the structure named in (a) (i) above is adapted to its function (2marks)

(b) Apart from gaseous exchange give one other function of stomata (1mark)

10. The equations below represent certain reactions in living organisms.

(i) $C_6H_{12}O_6 \longrightarrow 2C_2H_5OH + 2CO_2 + 210$ kJ

(ii) $C_6H_{12}O_6 + 6O2 \longrightarrow 6H_20 + 6CO_2 + 2880$ kJ

(a) Name the reactions represented by the equations (2 marks)

(b) Calculate the RQ for the reaction (II) (2marks)

11 (a) In a plant breeding experiment red flowered plants were crossed with white flowered plants.

Both plants were pure breeding. All F1 offspring's had pink flowers. Give a genetic explanation for this occurrence (1mark)

b) The words given in the table below are analogous to mutations. Fill in the table the type of mutation in each case (2 marks)

	Intended	Actual	Mutation
(i)	From	Form	----------
(ii)	super	supper	……

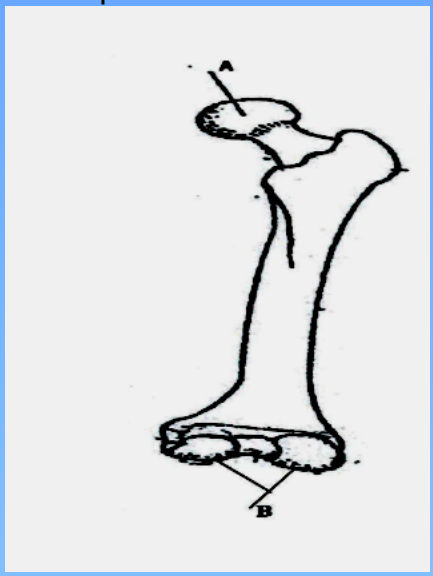
(c) State ONE chemical agent that causes mutation (1mark)

12 Explain what would happen if there is more water in the mammalian blood (4marks

13 (a) List three evidences that support organic theory of evolution (3 marks)

(b) Why is Larmack's theory of evolution not acceptable? (2marks)

14 The diagram below represents a mammalian bone



(a) Name the bone (1mark)

(b) Name the type of joint formed by the bone at its anterior end **A** and the adjacent bone

(c) State the function of part labeled **B.** (1mark)

15 (a) In an accident, a victim suffered brain injury consequently the heart beat was affected. Name the part of the brain which was injured. (1 mark)

(b) Differentiate between simple reflex action and conditioned reflex action (2marks)

16 Explain why the carrying capacity for wild herbivorous animals is higher than that for cattle in a given piece of land. (2marks)

(b) Name the bacteria found in root nodules of leguminous plants (1mark)

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

17 (a) In deamination, the amino group of the amino acid is normally removed to form ammonia. What happens to this ammonia? (1mark)

(b) State **Three** reasons why plants do not have a problem of excretion (3marks)

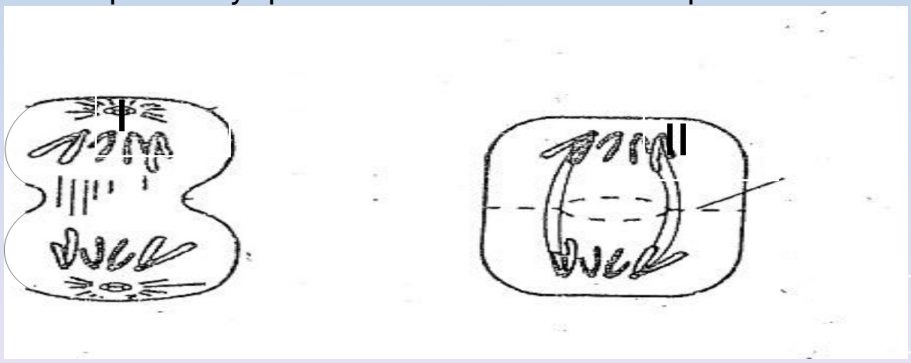
18 (a) State where the light stage of photosynthesis process occur. (1mark)

(b)Give **TWO importances** of the light stage in photosynthesis (2marks)

19 Name the three types of transpiration (3 marks)

20 Name **THREE** support tissues found in woody plants (3 marks)

21 The figure below represents cytoplasmic division in animal cell and plant cell.



T

a) Identify the phase of cell division (1mark)

b) Name the structure labeled **T** (1mark)

c) Name the part of the plant from which the cell labeled **II** was obtained (1mark)

22. The table below gives information about some diseases. Complete the table (4marks)

Disease	Type of organism causing the disease	Mode of transmission
1…….	Plasmodium Spp.	Bites by Anopheles mosquito
2. Amoebiosis	……	Ingestion
3. Cholera	Vibrio cholerae	…….
4. Typhoid	…….	Taking in contaminated food or water

23. State one survival value of Nastic response (1mark)

24 (a) State the major effect of decrease of juvenile harmone (1mark)

(b) Explain the meaning of the term instar (1mark)

ALLIANCE GIRLS SCHOOL KCSE TRIAL AND PRACTICE EXAM.

Paper 2

1. A human gene which is Y-linked controls the length of hair on male ears. One allele produces non-hairy ears while the other produces hairy ears, (hairy pinna).

(a) What are alleles (1mark)

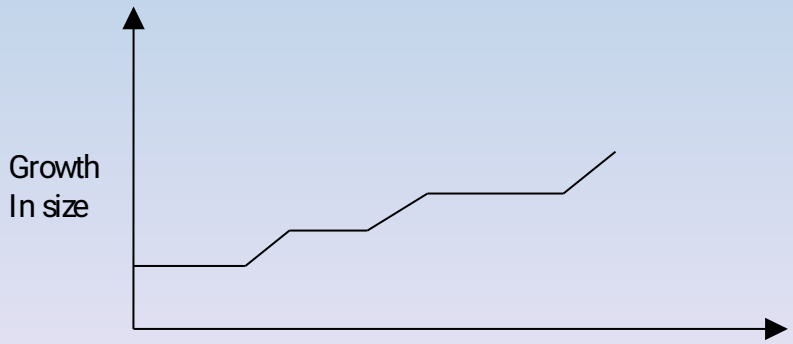
(b) If a man with hairy ears/pinna marries, work-out the phenotypes of his children. (Use letter h to represent gene for hairy pinna). (4 marks)

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

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

2. (a) The graph below represents the growth pattern of animals in a certain phylum

3.



(i) Name the phylum showing the above growth pattern (1mark)

(ii) State the type of growth shown (1mark)

(iii) Explain the growth pattern illustrated by the graph (3marks)

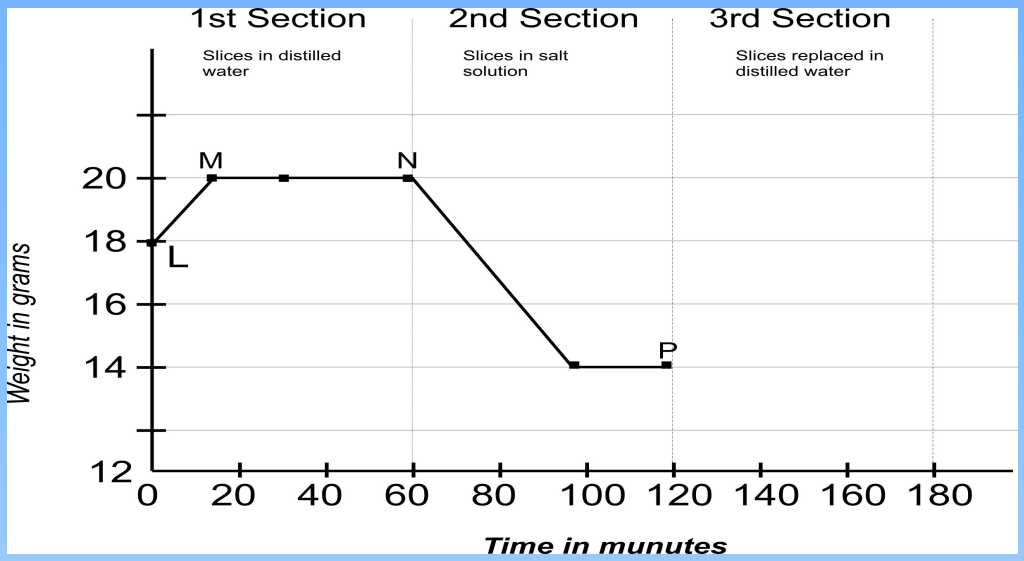
(b) Explain the meaning of

i) Growth (1mark)

(ii) Development (1mark)

(ii) Cleavae .(1mark)

4. In an experiment some slices were cut from a living potato tuber and were immersed in distilled water for one hour. After that the slices were immersed in a concentrated salt solution for another one hour. The slices were taken out of the liquid, weighed and immersed again in the liquid at regular intervals. The results are shown in the graph below. Point **L** shows the beginning of the experiment.



a) Give the name given to the condition of the cells of the slices at point **L**(1mark)

b) (i) find the change in weight between **L** and **M** (1mark)

(ii) Which process brings about this change in weight? (1mark)

(c) Explain the condition of the cells at point **N**. (2mark)

(d) The slices were removed from the concentrated salt solution at point P and washed in distilled water. Draw a curve on the graph, to show what would happen in the next one hour in the third section. (1mark)

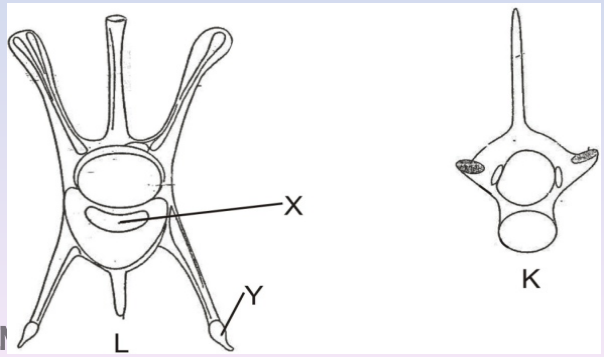
(e) State two characteristics of active transport (2marks)

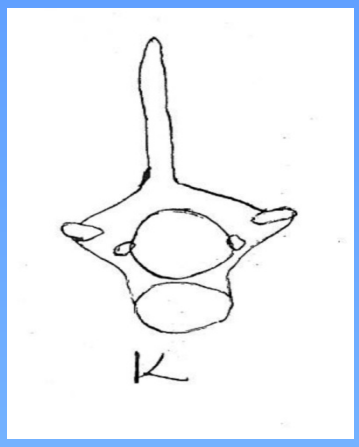
5. (a) Explain how carbon (IV) oxide produced by respiring mesophyl cells of flowering plants reaches the atmosphere (4 marks)

(b) How are submerged hydrophytes adapted for gaseous exchange (2marks)

(c) State 2 respiratory diseases in Man (2marks)

6. The following figures are anterior views of two vertebrae





a) Identify the vertebrates (2marks)

b) State where vertebra **K** is located in human body (1mark)

c) Name two parts labeled **X** and **Y** in vertebrae **L** (2marks)

d) How is vertebra **K** adapted to its function (3marks)

7. An investigation was carried out between 2003 and 2012 to study the changes of fish population in a certain small lake. Four species of fish, **T, W, M, P** were found to live in this lake. In 2004 a factory was built near the lake raising the average temperature from 25°C to 30°C. In 2005 sewage and industrial waste from a nearby town was diverted into the lake. 2007, discharge of hot water, sewage and industrial waste into the lake was stopped. The fish population during the period of investigation are shown in the table below.

Fish species	2003	2005	2007	2009	2010	2011	2012
T	5900	200	17	100	700	4300	8000
W	300	25	8	19	60	400	508
M	30	120	0	0	0	0	0
P	4300	260	25	30	35	510	807

(a) (i) In which year were the fish population lowest? (1mark)

(ii) State the factors that might have caused the lowest fist population during the year you have stated in (a)(i) above (3marks)

(iii) Explain how each factor you have stated in (a)(ii) above could have brought about the changes in fish population (6marks)

(b) (i) What is the difference in the rate of population recovery of species T and P? (3marks)

(ii) Suggest two biological factors that could have led to this difference (2marks)

(c) (i) State a method that might have been used in estimating the fish population in the lake? (1mark) (ii) State one advantage of the method you have stated in (c) (i) above (1mark)

(iii) State three limitations of the method named in (c) (i) above. (3marks)

8. How is the mammalian skin adapted to its functions (20 marks)

9. (a) Explain the role of Auxin in Geotrophic response in plants (5 marks)

(b) Describe other roles of hormones in the growth and development of plants (15 marks)

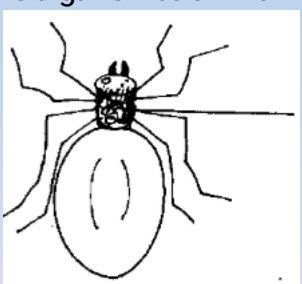
FRIENDS SCHOOL KAMUSINGA KCSE TRIAL AND PRACTICE EXAM .

231/1
BIOLOGY
Paper 1
Time: 2 Hours

Answer all questions in the spaces provided after each question.

1 Name the bond that exists between amino acids during condensation process of forming proteins? (1mk)

2. A student discovered the organism below moving about on the teacher's desk



(a) Name the class of which the organism belongs. (1mk)

(b) Name the part labelled **B**. (1mk)

3. A certain plant has the following characteristics: presence of roots, steams and the leaves, life cycle in saprophyte and gametophyte generation. Saprophyte generation being the dominant type. Name the division to which the plant belongs. (1mk)

4. State the biological significance of each of the following.

(a) Thick muscular walls and narrow lumen in arteries. (1mk)

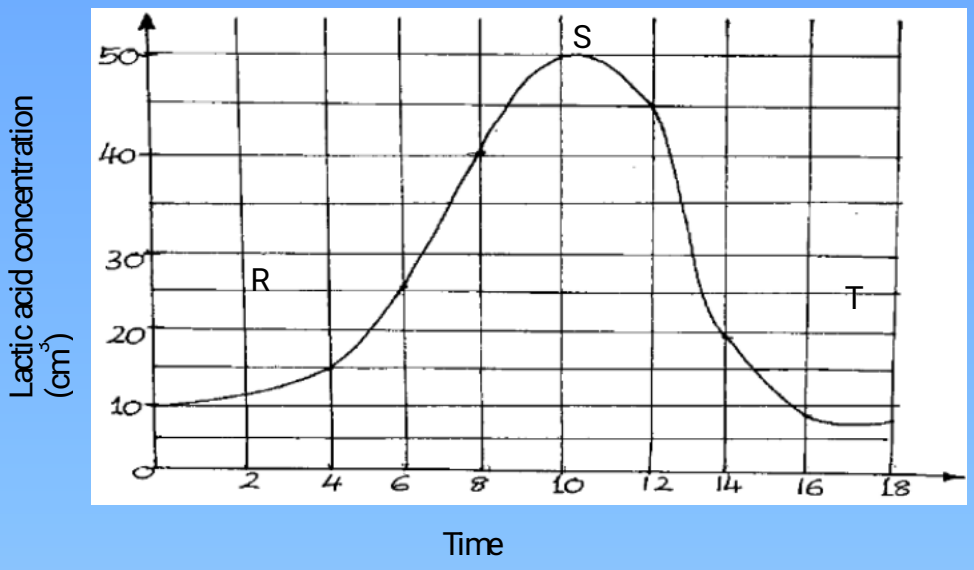
(b) Narrow xylem vessels in flowering plants. (1mk)

5. What are **two** source of genetic diversity in meiosis ? (2mks)

6. Explain why primary productivity decreases with depth in aquatic environment. (2mks)

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

8. The diagram below shows the general appearance of lactic acid in the blood of an athlete after an exercise. Study it carefully and answer the questions that follow.

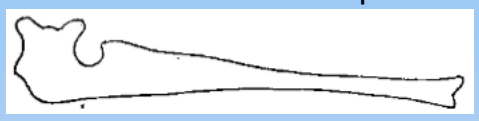


(a) Name the physiological process represented by the above diagram (1mk)

(b) Explain what was happening in the body between points: (2mks)

9. Name the class in the phylum arthropoda which has the larger number of individuals. (1mk)

10. A bone obtained from a mammal is represented by the diagram below.



(a) Name the bone (1mk)

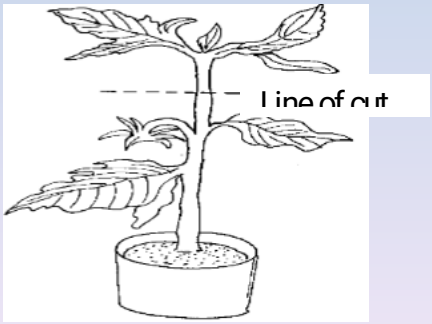
(b) Which bones articulates with the bone shown in the diagram at the notch? (2mks)

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

(ii) Give an example of a vestigial structure in any other organism other than human? (1mk)

(c) Explain why certain drugs become infective in curing a disease after many years of use (2mks)

12. In an experiment the shoot tip of a young tomato plant decapitated as shown in the diagram below.



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

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

13. State **three** structural differences between Deoxynbonocleic acid (DNA) and Ribonucleic acid (RNA) ?

14. Explain why plants do not require specialized excretory organs. (3mks)

15. Explain how the following factors affect the rate of photosynthesis

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

(b) Light intensity (1mk)

16. Name **three** distinguishing characteristics that make man more developed and superior to all other mammals. (3mks)

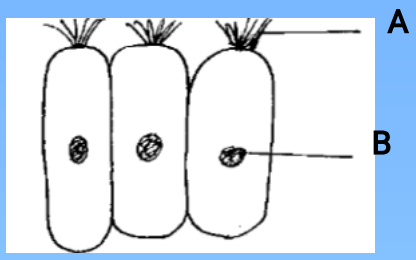
17. State **two** advantages of cross-pollination. (2mks)

18. State the role of the following parts in the mammalian intestine

(a) Lacteal in the villi (1mk)

(b) Goblet cells (1mk)

19. Study the figure below which shows a type of epithelial tissue



(a) State the name of structure **A**. (1mk)

(b) Give an example in humans where this epithelium is found (1mk)

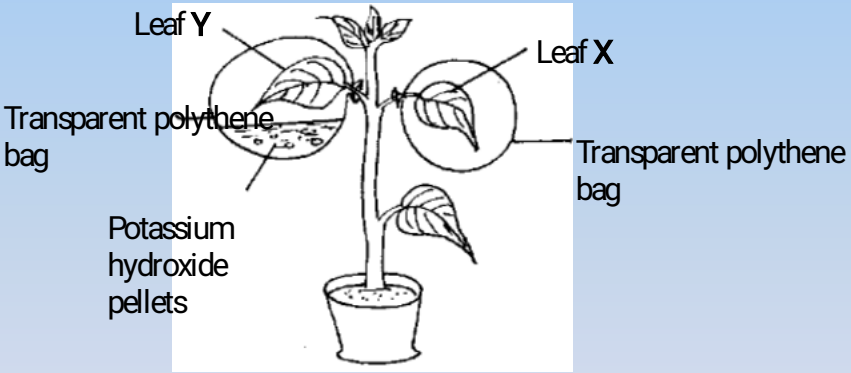
20. A mother of blood group **AB** was married to a man of blood group **B**. What is the probability that one of their children would be blood group **A**. Show your workings. (3mks)

21. Name the substance in plasma and red blood cells that transport carbon (iv) oxide. (2mks)

(i) Plasma

(ii) Red blood cells

22. A potted plant was kept in dark for 48 hours. Two leaves **X** and **Y** were treated as shown in the diagram below.

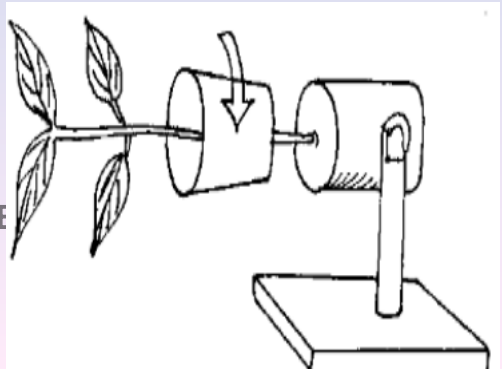


The experimental set up was kept in the sunlight for 6 hours after which a starch test was carried out on the two leaves.

(a) What were the results of the starch test on leaves **X** and **Y**? (2mks)

(b) Give reasons for your answers in (a) above (2mks)

23. Carefully study the figure which rotates making one resolution in 15 minutes. A seedling with a straight radicle and plumule was attached to the apparatus as shown below.



(a) What is the name of the apparatus shown (1mk)

(b) Make a drawing of how the seedling might have appeared after one week. (1mk)

24. (a) What is meant by the term non-disjunction? (1mk)

(b) Give an example of genetic disorders caused by:

(i) Non-disjunction (1mk)

(ii) Gene mutation

25. To estimate the population size of crabs in a certain lagoon, traps were laid at random, 400 crabs were caught, marked and released back into the lagoon. Four days later traps were laid again and 374 crabs were caught. Out of the 374 crabs, 80 were found to have been marked.

(a) Calculate the population size of the crab in the lagoon using the formula below:

$$N = \frac{n \times M}{m}$$

Where:

N = Total population of crabs in the lagoon

n= Total number of crabs in the second catch

M= Number of marked crabs during the first catch

m= Number of marked crabs in the second catch. (2mks)

(b) State the assumptions that were made during the observation (2mks)

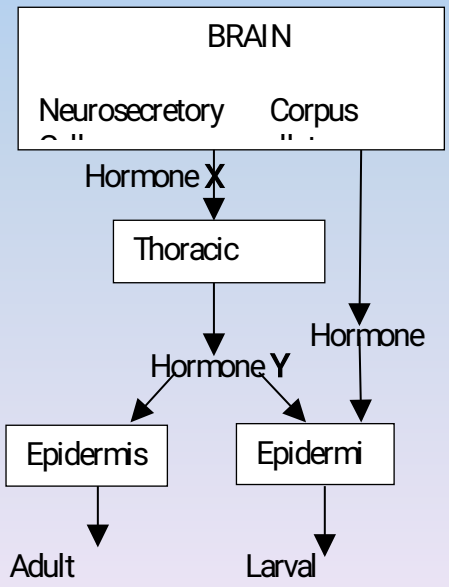
(c) What is the name given to this method of estimating the population size (1mk)

26. State the role of light in the process of photosynthesis. (1mk)

27. When are the **two** organisms considered to belong to the same species. (1mk)

28. State the role of insulin in the human body (1mk)

29. The chart below is a summary of the role of hormones in insect metamorphosis



(a) Name each of the hormones represented by letters **X** and **Y.** (2mks)

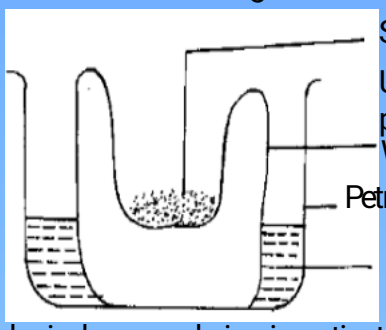
(b) State the function of hormone **Z** (1mk)

(c) What is the advantage of production of hormone **Y** alone without the secretion of hormone **Z** (1mk)

30. Give **two** ways in which the mammalian uterus becomes adapted to implantation of zygote (2mks)

31. A form one student trying to estimate the size of onion cells observes the following on the microscope's field of view. He counts 20 cells across the field of view which is 3mm. Calculate the size of one cell in micrometers. (3mks)

32. An experiment to investigate a certain physiological process was set up a shown below. After three (3) hours it was observed that the level of the sugar solutions had risen.



(a) Name the physiological process being investigated? (1mk)

(b) Account for the rise of the level of sugar solution in the experiment (3mks)

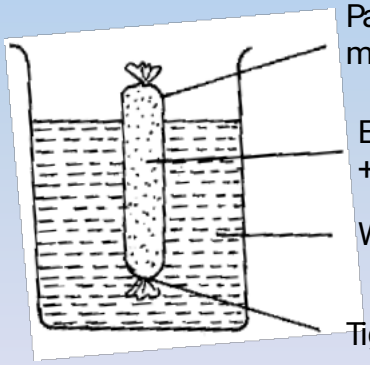
FRIENDS SCHOOL KAMUSINGA KCSE TRIAL AND PRACTICE EXAM.

Paper 2

SECTION A (40 MARKS)

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

1. The figure below shows apparatus at the start of an experiment to investigate the digestion of an emulsion of fat droplets in water by enzyme **A**.



The pH indicator is green in a pH of 7, blue when the pH is above 7 and red when it is below 7. The apparatus is kept at 40°C for 20 minutes during which time the indicator changes from green to red.

(a) Describe how the products of fat digestion enter a person's blood. (1mk)

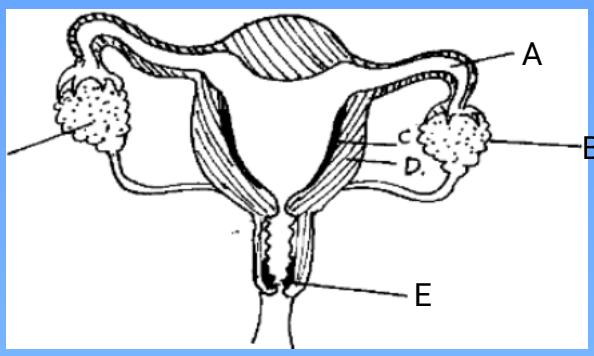
(b) (i) State the identity of enzyme **A**. (1mk)

(ii) Explain why the apparatus was kept at 40°C. (1mk)

(c) Name the products of digestion of the emulsion by enzyme **A**. (2mks)

(d) Describe the process which led to the change in pH (3mks)

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



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

(b) What are the functions of the part labelled **A**. (2mks)

(c) Which part of the structure responds to:

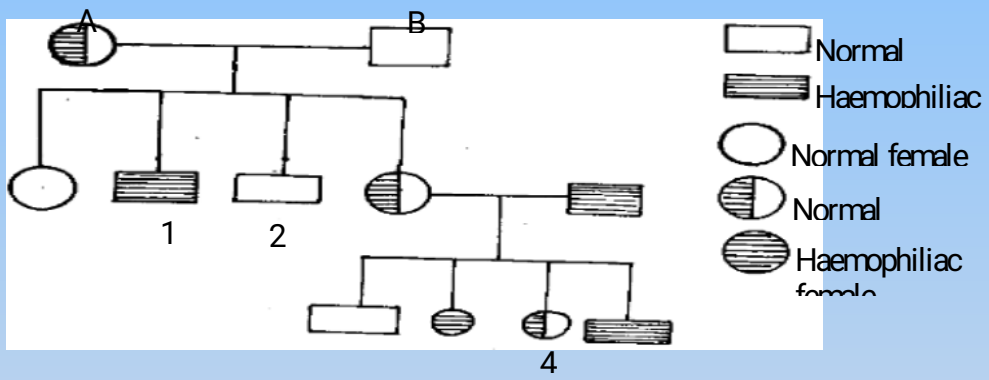
(i) Progesterone (1mk)

(ii) Oxytocin (1mk)

(d) Which type of cell division occurs in structure **B** and not structure labeled **E**. 1mk)

(e) State **two** functions of testosterone (2mks)

3. The hemophilia is an **X**- linked recessive condition. The following pedigree shows a portion of a family in which members have hemophilia. Use **H** for non-hemophilia **h** for hemophilia.



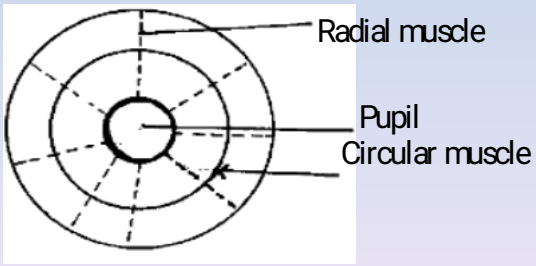
(a) Identify the genotypes of parents **A** and **B**.

(b) What is the genotype of offspring number 1 (1mk)

(c) A carrier woman marries a hemophiliac man. What is the probability that the couple will have a son who is hemophiliac show your working. (4mks)

(d) Name **one** defect of non-disjunction chromosomal mutation (1mk)

4. The diagram below shows a front view of the iris and pupil of the eye.

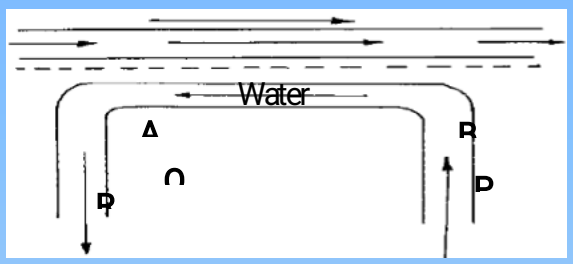


(a) Complete the table below to show what happens to the structure shown when the eye is in. (6mks)

Structure	Darkness	Bright light
Radial muscles		
Circular muscles		
Size of pupil.		

(b) Explain how myopia can be corrected. (2mks)

5. The diagram below represents the direction of flow of water over the gills of a fish and the flow of blood in a capillary in the gills the percentage oxygen in solution at points **A**, **B**, **P**, **Q** and **R** is given in the table below the diagram. The percentage hemoglobin saturation is also given at positions **P**, **Q** and **R**.



Blood to blood Blood from heart

Position	**% oxygen in solution**	**% Hb saturation with O_2**
A	10	____
B	7	____
P	4	55
Q	7	85
R	6	95

(a) Why is the percentage of oxygen lowest at **P**? (1mk)

(b) State with reasons, what this data suggest what will happen to oxygen in the water at position **B ?** (2mks)

(c) Why is the percentage of oxygen, in solution lower at **R** than at **Q** ? (1mk)

(d) Suppose the direction of blood was opposite the above, suggest the disadvantage of this arrangement as compared to the one above. (1mk)

(e) The principle whereby the blood flows in the opposite direction to that of another fluid is known as counter-current effect (flow). Give **two** examples where this effect occurs in the human body (2mks)

(f) Name any structure of gaseous exchange in the leaves of plants? (1mk)

SECTION B (40 MARKS)

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

6. The relationship between oxygen concentration, sugar consumption and potassium ion uptake in isolated wheat roots was determined. The results obtained were tabulated as shown below. The loss of sugar and potassium uptake or gain are in arbitrary units.

		Percentage oxygen in aerotun stream						
		0	5	10	15	20	30	100
Sugar loss		15	20	43	45	45	44	43
Potassium ion gain		5	55	70	75	75	72	70

(a) Plot graphs of sugar loss and potassium ions gain against oxygen concentration on the same axes.

(b)

(6mks)

(c) Name the process by which potassium ions is taken by the roots. Give reason for your answer (4mks)

(d) Account for sugar loss and potassium ions gain.

(i) 0% oxygen concentration (2mks)

(ii) Between 5% and 20% oxygen concentration (2mks)

(e) Suggest **two** factors necessary for the above process apart from oxygen (2mks)

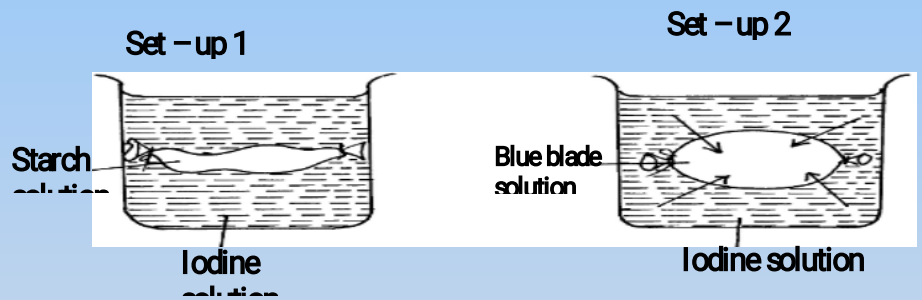
(f) State **two** ways by which the process above can be stopped (2mks)

(g) Name two main areas in a mammalian body where the above process occurs. (2mks)

7. Determine how the differentiated structures in the mammalian skin are adapted to the functions. (20mks)

8. State and explain how various hormones regulate growth and development of plants. (20mks)

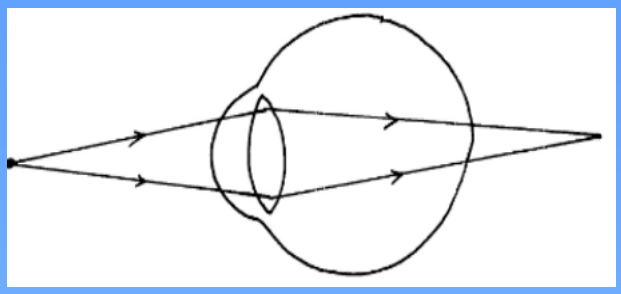
1. Name **two** sites of gaseous exchange in amphibians. (2mks)
2. State **two** roles of green plants in fish ponds other than providing food. (2mks)
3. Name **three** forces that maintain transpiration stream. (3mks)
4. Name the fins that prevent the following movements of fish during swimming. (3mks)
   i) Yawing
   ii) Pitching
   iii) Rolling
5. a) Name **two** disorders in humans caused by gene mutation. (2mks)
   b) Describe the following chromosomal mutations; (2mks)
   i) Inversion
   ii) Translocation
6. State **three** reasons for loss of energy from one trophic level to another in a food chain. (3mks)
7. a) Name the part of the eye where image is formed. (1mk)
   b) State **two** characteristics of the image formed on the retina. (2mks)
8. Name a support tissue in plants that is thickened with cellulose. (1mk)
9. State **two** functions of luteinizing hormone in reproduction. (2mks)
10. Give the meaning of the following terms. (2mks)
    i) Protandry
    ii) Self-sterility
11. a) State the difference between ball and socket and hinge joint. (1mk)
    b) State the functions of synovial fluid. (2mks)
12. A group of students from Awasi Boys High School set up an experiment to demonstrate a certain process. The experimental set up were as shown in the diagrams below.



After 10 minutes the students recorded their observation in a table as shown below.

	Observation	
	Inside the tube	**Outside the tube**
I	Blue black color	No color change
II	No colour change	Blue black colour

   a) Name the process being demonstrated by this experiment. (1mk)
   b) Explain the result in the experiment set up I. (3mks)
13. a) Name the structures in phloem that are involved in the translocation of sugars. (2mks)
    b) Other than sugars, name **two** compounds that are translocated in the phloem. (2mks)
14. State **four** ways in which the red blood cells are adapted to their function. (4mks)
15. a) What is oxygen debt? (1mk)
    b) Give the differences in products of anaerobic respiration in plants and animals. (1mk)
16. State the aspects of light that affect the rate of photosynthesis. (2mks)
17. The diagram below shows the position of an image formed in a defective eye.



a) Name the defect. (1mk)

b) Explain how the defect named in (a) above can be corrected. (2mks)

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

19. a)A certain animal has no incisors, no canines, 6 premolars and 6 molars in its upper jaw. It has 6 incisors, 2 canines, 6 premolars and 6 molars on the lower jaw. Write its dental formula. (1mk)

b) State the likely mode of feeding for the animal. (1mk)

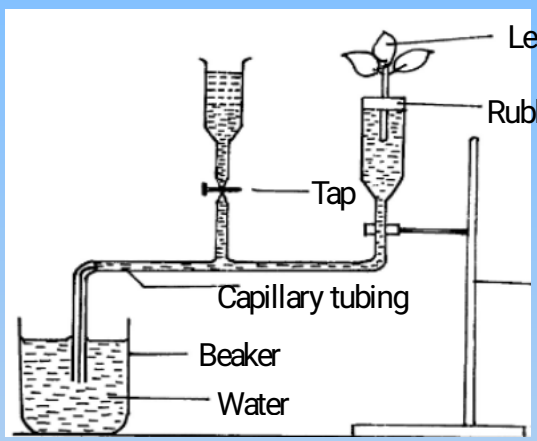
c) Give a reason for your answer in (b) above. (1mk)

20. State how the following structures of the skin are adapted to their functions; (3mks)

i) Malphigian layer

ii) Sebaceous glands

21. A set up that was used to investigate a certain process in plants as shown in the diagram below.



a) What process was being investigated? (1mk)

b) i) State **two** precautions that should be taken when setting up the experiment. (2mks)

ii) Give a reason for each precaution stated in b(i) above. (2mks)

22. State the functions of;

a) Ribosomes (1mk)

b) Golgi apparatus (2mks)

23. What is meant by the terms; (2mks)

a) Allele

b) Test-cross

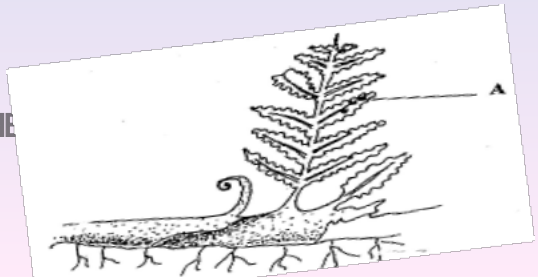
24. Give the difference between Darwinian and Larmackian theories of evolution. (2mks)

25. a) How is the starch utilized by the seedling? (3mks)

b) Name the hormone that is responsible for fruit ripening. (1mk)

26. Give the meaning of the term **binomial nomenclature**. (1mk)

27. Wanganga students collected the plant shown below during an education trip.



a) Name the part labeled **A**. (1mk)

b) i) State the division to which the plant belongs.

ii) Give **two** reasons for the answer in b(i) above. (2mks)

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

i) Candidiasis

ii) Cholera

29. State the form in which energy is stored in muscles. (1mk)

MOI GIRLS NAIROBI KCSE TRIAL AND PRACTICE EXAM .

Paper 2

SECTION A (40 MARKS)

Answer all questions in this section in the spaces provided.

1. a) Define the term mutation. (1mk)

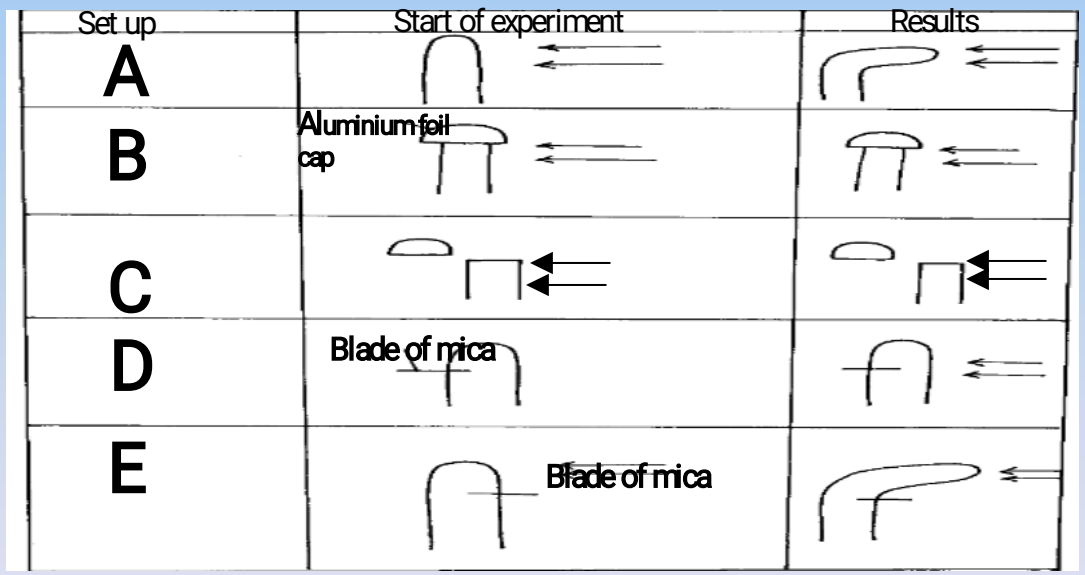
b) A couple, George and Grace had a son who was suffering from haemophilia even though none of them showed signs of haemophilia.

i) State the genotype of George and Grace. (2mks)

ii) Using a genetic cross work out the genotype of the couple's son. (4mks)

c) What are linked genes? (1mk)

2. An experiment was set up to investigate the effect of unilateral light on the growth of oat coleoptile. The diagrams in the table below represent the experimental set ups at the start, and at the end of the experiment.



Key: ⟸ Rays of light

a) Account for the results in the experimental setup **A**. (3mks)

b) Explain the purpose of experimental set ups **B** and **C**. (3mks)

c) Explain the results in experimental set ups **D** and **E**. (2mks)

3. Three pieces of potato cylinders of equal length were placed in three solutions of different concentrations.
The set ups were left to stand for 45 minutes. The results were recorded in the table below.

Solution	Initial length of cylinder (mm)	Final length of cylinder (mm)
A	40	40
B	40	38.5
C	40	41

a) Describe the nature of solution **A** in relation to the concentration of the potato cells. (1mk)

b) Explain the observation that was made on the potato cylinder which was put in solution **B**. (3mks)

c) i) State what would happen to red blood cells if they were placed in solution **C**. (1mk)

ii) Explain your answer in (c)(i) above. (2mks)

d) Name the process involved in uptake of mineral salts by plants from the soil. (1mk)

4) a) Explain the term double fertilization as applied in plants. (3mks)

b) State the role of each of the following hormones in male humans.

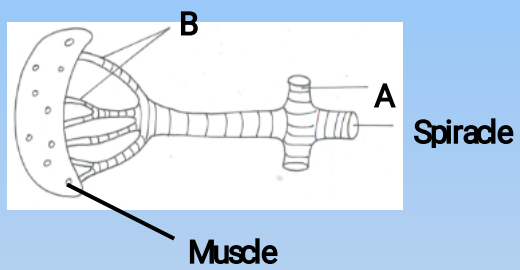
i) Follicle stimulating hormone. (1mk)

ii) Testosterone (1mk)

c) What is **in vitro** fertilization? (2mks)

d) Name the causative agent of gonorrhea. (1mk)

5. The diagram below shows part of gaseous exchange system in an insect. Study it and answer the questions that follow.



a) What are the structural adaptations of the parts labelled A and B to their functions? (2mks)

b) Name the parts of the following animals that carry out the same function as part **B** above. (2mks)

i) Man

ii) Tilapia fish

c) Name the structures used for gaseous exchange in plants growing in water logged soils. (1mk)

d) i) Give **two** reasons why accumulation of lactic acid during vigorous exercise leads to an increase in heartbeat. (2mks)

ii) In what form is oxygen transported from lungs to the tissues? (1mk)

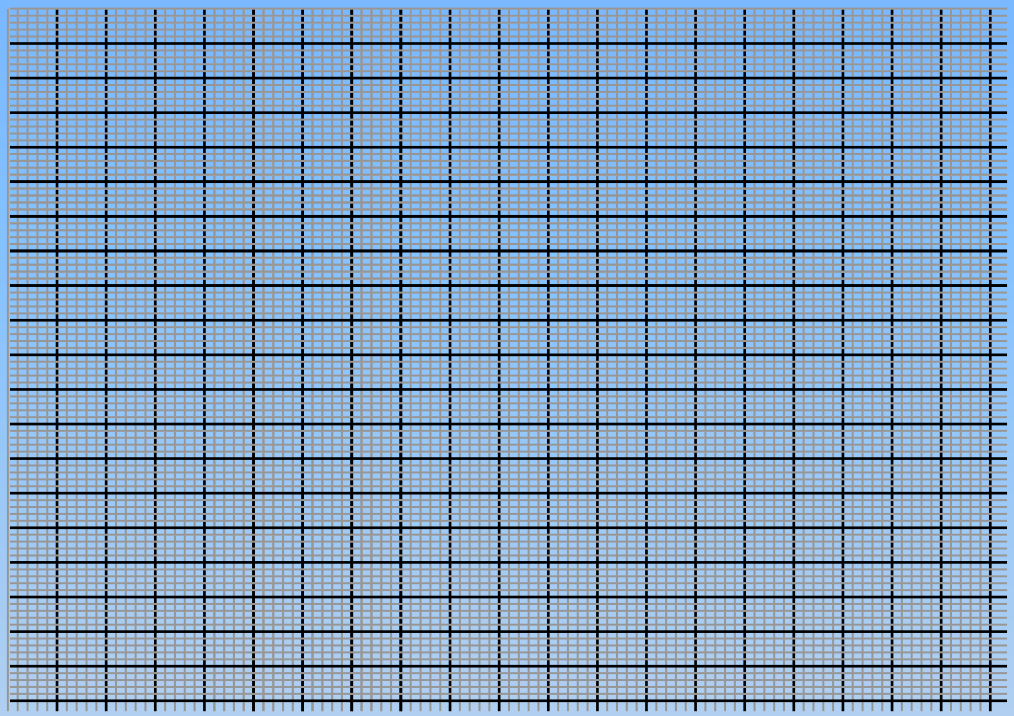
SECTION B (40 MARKS)

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

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

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

a) On the same axes, draw graphs of dry weight of endosperm, embryo and the total dry weight against time. (7mks)



b) What was the total dry weight on day 5? (1mk)

c) Account for:

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

ii) Increase in dry weight of embryo from day 0 to day 10. (2mks)

iii) Decrease in total dry weight from day 0 to day 8. (1mk)

iv) Increase in dry weight after day 8. (1mk)

d) State **two** factors within the seed and two outside the seed that cause dormancy.

i) Factors within the seed. (2mks)

ii) Factors outside the seed. (2mks)

e) Give **two** characteristics of meristematic cells. (2mks)

7. Describe how a mammalian heart is adapted for its function. (20mks)

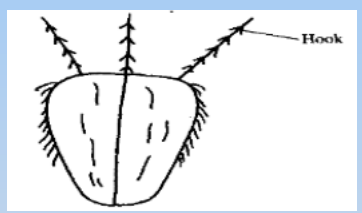
8. a) Describe how xerophytes are adapted to living in their habitat. (10mks)

b) Explain how an upright position is maintained in herbaceous plants. (10mks)

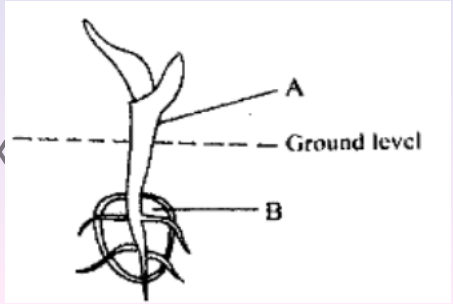
AND PRACTICE EXAM .

231/1
BIOLOGY
PAPER 1
TIME: 2 HOURS

1. Name the type of circulatory system found in the phylum Arthropoda (1mks)
2. State the areas of the plant where translocated materials are taken (2mks)
3. (a) Name the component of a person's diet that is essential for peristalsis (1mk)
   (b) Give **two** groups of food which are reabsorbed along the mammalian digestive system without undergoing digestion. (2mks)
4. The reaction represented by the equation below occurs in the body.
   Hydrogen peroxide $\xrightarrow{\text{Enzyme Y}}$ Oxygen + Water
   (a) Name enzyme **Y**. (1mk)
   (b) Name an organ in the body where the reaction occurs. (1mk)
5. What do you understand by the following terms
   (a) Anatomy (1mk)
   (b) Biochemistry (1mk)
6. State the functions of the following parts of a cell
   (a) Ribosome (1mk)
   (b) Chloroplasts (1mk)
7. State the role of the following parts of the skin (a) Cornified layer (1mk)
   (b) Malpighian layer (1mk)
8. Name the blood vessel that nourishes the heart (1mk)
9. (a)Name **two** disorders in man that occur through gene substitution (2mks)
   (b) Give **two** advantages of polyploidy in plants. (2mks)
10. (a) Explain what is meant by the term oxygen debt in human beings. (1mk)
    (b) What are the end products of anaerobic respiration in animals. (2mks)
11. The diagram below represents a mature fruit from a dicotyledonous plant, observe it and answer questions that follow.



    (a) To what group of fruits does the specimen belong? (1mk)
    (b) Suggest the possible agent of dispersal of the fruit (1mk)
12. Explain why menstrual periods stops immediately after conception? (3mks)
13. (a) Why is sexual reproduction important in evolution of plants and animals (1mk)
    (b) The calyx cells of a certain plant has 22 chromosomes. State the number of chromosomes present in plants
        (i) Endosperm
        (ii) Ovule cell (2mks
14. Explain why sweat accumulates on a person's skin in a hot humid environment. (2mks)
15. The diagram below represents a maize seedling



(a) (i) Name the type of germination exhibited by maize (1mk)

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

(b) State the functions of the parts labelled **A** and **B**. (2mks)

16. State the role played by the following substance in digestion.

(i)Hydrochloric acid (2mks)

(ii) Bile salts

17. State how the following factors control population.

(i)Predation (1mk)

(ii)Competition

18. Give **three** importance of mammalian skeleton. (3mks)

19. State **two** advantages of a metamorphosis in the life of insects. (2mks)

20. State the functions of the following structures of the mammalian ear

(a) Eustachian tube (1mk)

(b) Ossicles

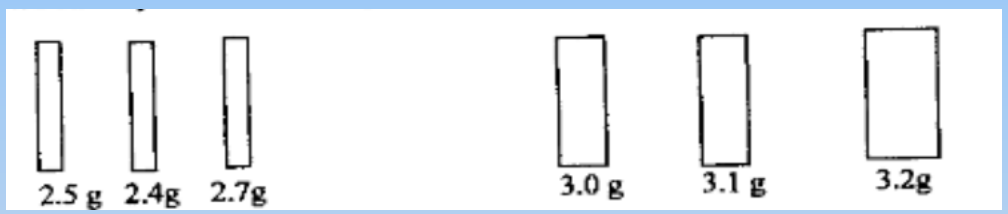
21. (a) John and Becky who are siblings are both normal as their parents but have a haemophilic brother. Give the genotype of their parents. (2mks) (b) What are linked genes?

22. State **two** adaptation of alveolus to its functions. (2mks)

23. (a) What are the analogous structures? (1mk)

(b) Give **two** examples of homologous structures. (2mks)

24. Potato cylinders were weighed and kept in distilled water overnight. They were then reweighed.



At the beginning of the experiment *At the end of the experiment*

(a) Calculate the average mass of the potato cylinders after reweighing. Show your working. (2mks)

(b) Explain why mass of cylinders had increased. (2mks)

25. (a) In which form is oxygen transported in blood. (1mk)

(b) Why do plants not take in oxygen during the day although they need it for respiration. (1mk)

26. (a) Distinguish between conditioned and simple reflexes. (2mks)

(b) State how the nerve cell structure is suited to its function of impulse transmission. (2mks)

27. State **two** factors that hinder self-pollination and fertilization. (2mks)

28. Name joints formed between the:

(a)Humerous and scapula.

(b) Cranial bones. (1mk)

29. State the effects of the following plant growth hormones

(i) Gibberellins (1mk)

(ii) Abscisic Acid (1mk)

30. Name support tissues in plants thickened with:
(a) Cellulose (1mk)
(b) Lignin (1mk)

31. State **three** biological importance of tropisms in plants. (3mks)

KENYA HIGH SCHOOL KCSE TRIAL AND PRACTICE EXAM .

Paper 2

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1. (a) State the role of the following parts of a light microscope. (2mks)
(i) Diaphragm
ii) Revolving nosepiece

(b) During preparation of temporary slides, the following procedures are carried out, state the importance of each.
i) Staining (2mks)
ii) Cutting very thin sections

(c) Name the cell organelle that: (2mks)
i) Forms secretory vesicles
ii) forms site of protein synthesis

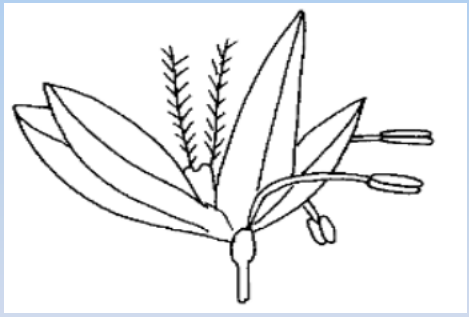
(d) Name the tissue that carry out the following functions in plants: (2mks)
i) Filling the spaces between other tissues.
ii) Manufacture of food substances.

2. (a) Describe the following chromosomal mutations. (2mks)
(i) Inversion
(ii) Deletion.

(b) In humans, the disease phenylketonuria is inherited through a recessive gene. A phenotypically normal couple produced one normal child and one phenylketonuric child.
(i) Using a symbol **A** for normal gene and **a** for phenylketonuric gene, write down the genotypes of the parents. (2mks
(ii) Work out the possible genotype of the normal child. (3mks)

(c) What is meant by genetic engineering? (1mk)

3. The diagram below shows the structure of a flower.



(a) To what family does the flower belong? (1mk)
(b) (i) Suggest the agent of pollination of the flower. (1mk)
Give reasons for your answer in (b) (i) above. (2mks)

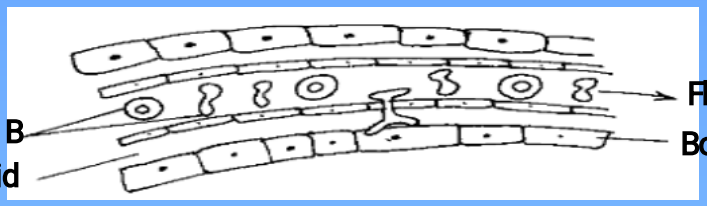
(c) Name the parts of the flower that develops into each of the following (2mks)
(i) Seed coat
(ii) seed

(d) Pregnancy will continue normally even if the ovaries of an expectant mother are removed after 4 months. Explain. (2mks)

4. (a) Distinguish between single circulatory and double circulatory system. (2mks)

(b) A person of blood group **O** requires a transfusion. Name the blood group (s) of the possible donor. (1mk)

The diagram shows the exchange site between circulatory system and body cells.



(i) Name the blood cells labelled **B**. (1mk)

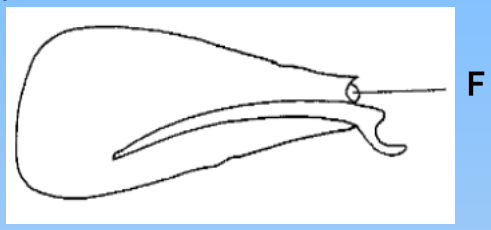
(ii) State the difference between blood and tissue fluid. (2mks)

(d) State **two** environmental factors that cause a decrease in rate of transpiration in leaves. (2mks)

5. (a) What are the analogous structures as used in evolution? (1mk)

(b) How do disease causing micro-organisms become resistant to drugs. (3mks)

(c)The diagram below represents a bone of a mammal.



(i) Identify the bone. (1mk)

(ii) Name the bone that articulates at the point labelled **F**. (1mk)

(iii) Explain **two** adaptations of the bone identified in (i) above. (2mks)

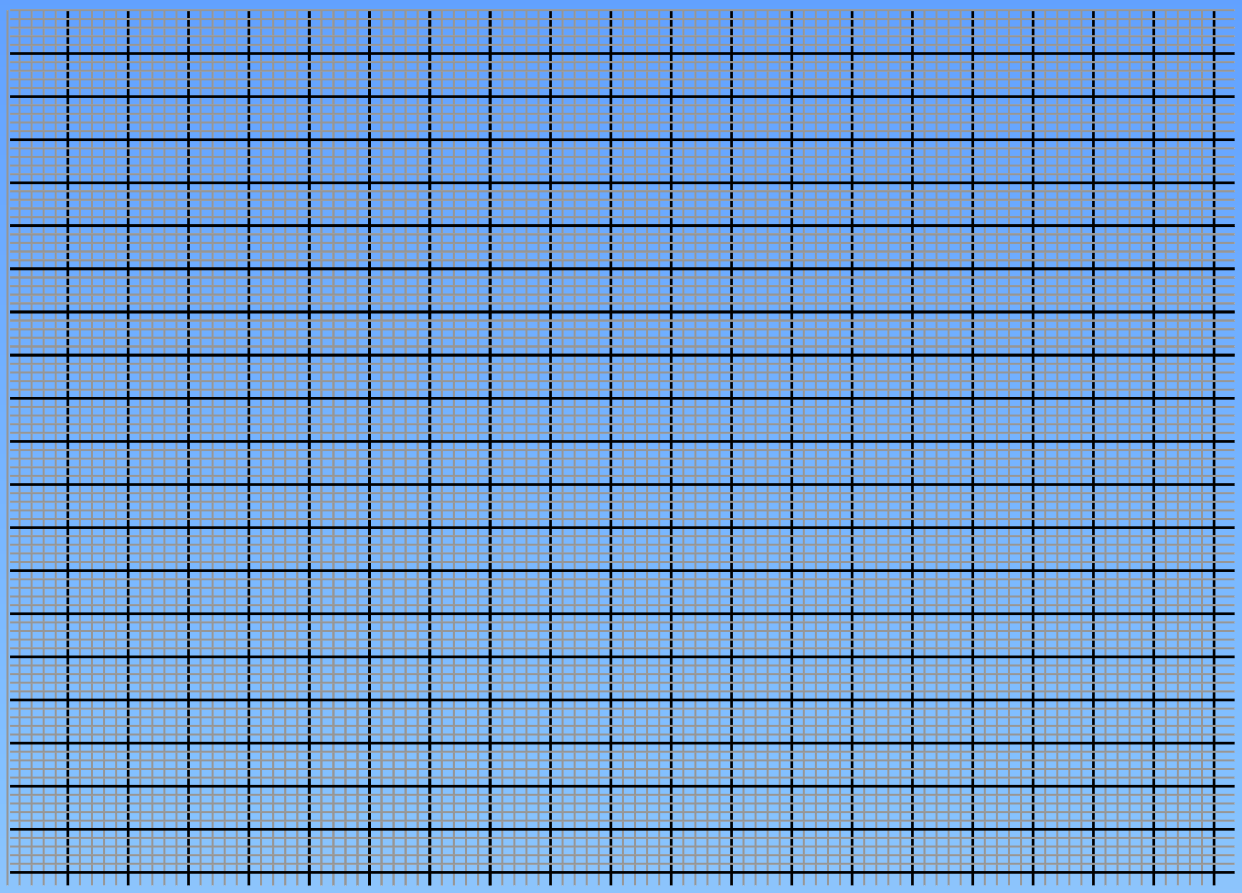
SECTION B (40 MARKS)

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

6. (a) An experiment was carried out to investigate the population of a certain micro- organism. Two Petri-dishes were used. Into the petridish labelled **M**, 60cm^3 of a culture medium was placed while 30cm^3 of the same culture medium was placed in Petri-dish labelled **N** equal numbers of micro organisms were introduced in both Petri dishes. The set ups were then incubated at 35^{0}C. The number of micro-organisms in each was determined at irregular intervals for a period of 60 hours. The results were as shows in the table below.

Relative number of microorganisms	**M**	40	40	180	280	1200	1720	1600	1840	1560	600
	N	40	40	120	200	680	560	560	600	600	400
Time in hours		0	5	10	15	23	30	35	42	45	60

(i) On the same axes, draw the graphs of relative number of microorganisms against time on the grid provided. (7mks)



(ii) After how many hours was the difference between the two populations greatest? (1mk)

(iii) Work out difference between the two populations at 50 hours. (2mks)

(iv) With a reason state the effect on the population of microorganisms in petridish **M** if the temperature was raised to 60^0C after 20hours. (2mks)

(v) Account for the shape of the curve for population in petridish **N** between 46 hours and 59 hours. (3mks)

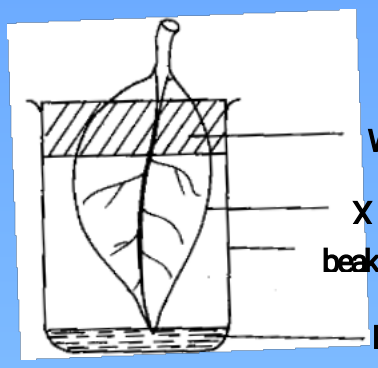
(b) Explain how the osmotic pressure of the mammalian blood is maintained constant. (5mks)

7. Explain how the mammalian eye is adapted to its functions (20mks)
8. Explain how abiotic factors affect plants. (20mks)

MARANDA SCHOOL KCSE TRIAL AND PRACTICE EXAM .

231/1
BIOLOGY
PAPER 1
TIME: 2 HOURS

1. State the functions of each of the following cell organelles.
   (a) Lysosomes
   (b) Golgi apparatus
2. Give any **two** factors that hinder self-fertilization in flowering plants. (2marks)
3. The diagram below shows an experiment that was carried out to investigate photosynthesis on a leaf from a potted plant.



The plant was kept in the darkness for 48 hours before the experiment. The set-up was left in the light for several hours, and then the leaf was tested for starch.
   (a) What results was expected in region: (2mks)
   (b) State the role of potassium hydroxide in the experiment. (1mark)
4. (a) What is sex-linkage. (1marks)
   (b) Name **two** sex linked traits in humans. (2marks)
5. Give **three** ways in which red blood cells are adapted to carrying out their function. (3marks)
6. Explain the importance of each of the following during the process of digestion in human beings.
   (a) Bile (1mk)
   (b) Saliva (2mks)
7. What changes would occur to a marine amoeba species if it was transferred into a fresh water pond? (2mks)
8. Distinguish between analogous and homologous structures. (2marks)
9. (a) State **one** function of cilia in organisms. (1mark)
   (b) Name **two** parts of the human body which have cilia. (2marks)
10. John and Paul, who are siblings, are both normal and so are their parents, but they have a haemophilic brother. Give a genotype of their parents. 2marks)
11. The diagram below represents the mature fruit of a certain plant.



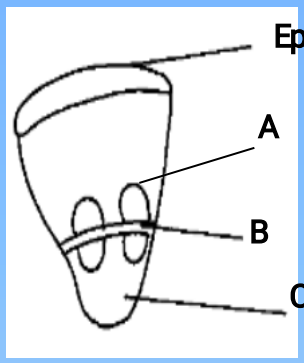
   (a) State the agent of dispersal for the fruit. (1mark)
   (b) Give **one** reason for your answer in (a). (1mark)
   (c) State **one** advantage of fruit and seed dispersal. (1mark)
12. In the experiment, it was observed that when maggots are exposed to light, they move to dark areas, while *Euglena* and *Chlamydomonas* move towards the light.
   (a) Name the type of response exhibited by:

(i) Maggots (1mark)
(ii) *Euglena* and *Chlamydomonas* (1mark)
(b) State the importance of the response shown by:
(i) Maggots (1mark)
(ii) *Euglena* and *Chlamydomonas* (1mark)

13. (a) Name the hormone responsible for apical dominance in plants. (1mark)
(b) Aldosterone is a hormone involved in homeostasis.
(i) Name the gland that produces aldosterone. (1mark)
(ii) State the function of aldosterone. (1mark)

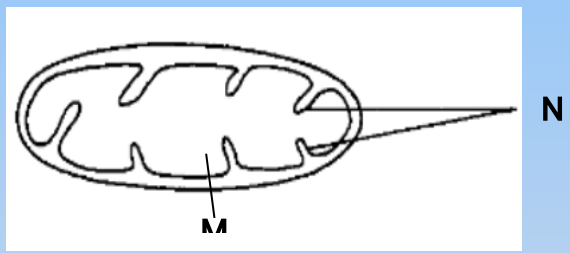
14. (a) Name the process by which urea is formed in the liver. (1mark)
(b) Explain the importance of excreting urea from the body. (1mark)
(c) Young growing children excrete less nitrogen compared to what they consumed. Explain. (1mark)

15. The diagram below shows a section of a dicotyledonous stem.



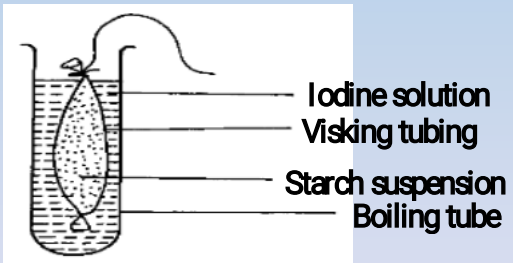
(a) Name the parts marked: (2mark)
(b) State the function of the part marked **B**. (1mark)

16. Study the diagram of a cell organelle shown below and answer the questions that follow.
(a) Name the parts labelled **M** and **N**.



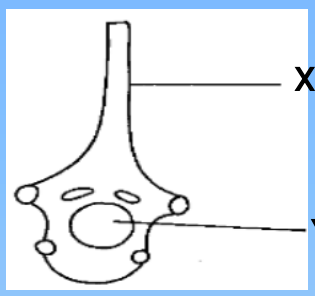
(b) State the function of the organelle. (1mark)

17. Study the diagram below.

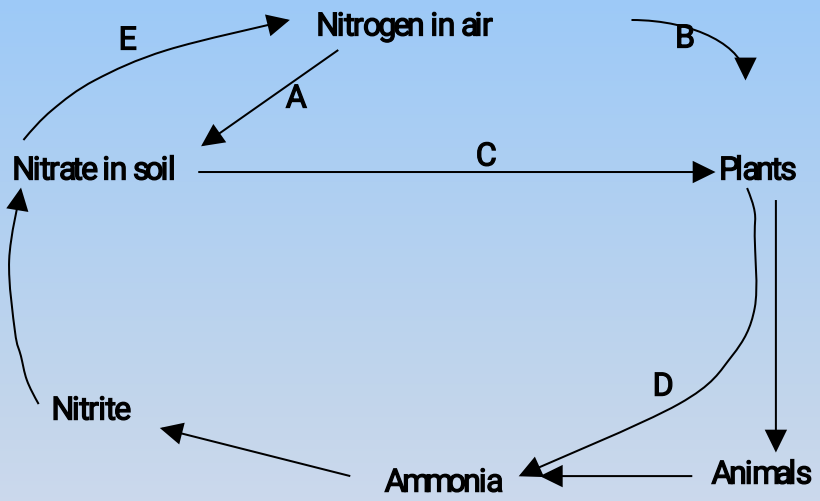


(a) What colour is expected in the visking tubing and iodine solution after sometime?
(i) In visking tubing. (1mark)
(ii) Iodine solution (1mark)
(b) Explain the observation in iodine solution. (1mark)

18. Name **three** support tissues in higher plants. (3marks)
19. What is the function of aerenchyma tissue in hydrophytic plants? (2mark)
20. How is the alveolus of a mammal adapted for gaseous exchange? (3marks)
21. (a) Name the organisms that cause the following diseases.
    (i) Malaria (1mark)
    (ii) Cholera (1mark)
    (b) State **one** way of controlling schitosomiasis (bilharzia)
22. What is the importance of:
    (i) Primary growth (1mark)
    (ii) Secondary growth (1mark)
23. State **three** adaptations of sperm to its function. (3marks)
24. What is the importance of the following in plant nutrition.
    (a) Root hairs (1mark)
    (b) Stomata (1mark)
    (c) Xylem (1mark)
25. The diagram below represents the structure of a mammalian vertebra.



    (a) Identify the vertebra. (1mark)
    (b) Name the parts labelled **X** and **Y**.
26. The figure below represents the cycling of nitrogen in nature.



    (a) Name the process represented by letters (3marks)
    (b) Name the organisms responsible for process **B**. (1mark)
27. What are the economic importance of organisms in kingdom fungi. (3marks)
28. State **three** evidences that support the theory of evolution. (3marks)

MARANDA SCHOOL KCSE TRIAL

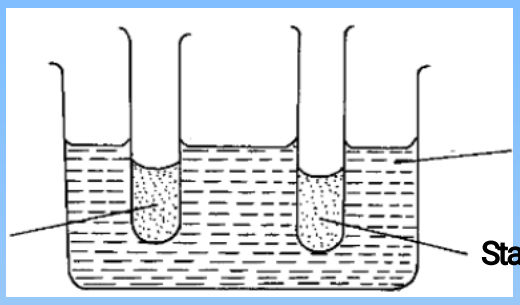
SECTION A: (40 MARKS)

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

1. A cross between a red flowered plants produced plants with pink flowers.
Using **R** to represent the gene for red colour, and **W** for white colour,
(a) What were the parental genotypes (1mark)
(b) Work out a cross between **F1** plants. (4marks)
(c) Give the:
(i) Phenotypic ratio of F_2 plants (1mark)
(ii) Genotypic ratio of F_2 plants (1mark)
(d) Name a characteristic in humans which is controlled by multiple alleles. (1mark)

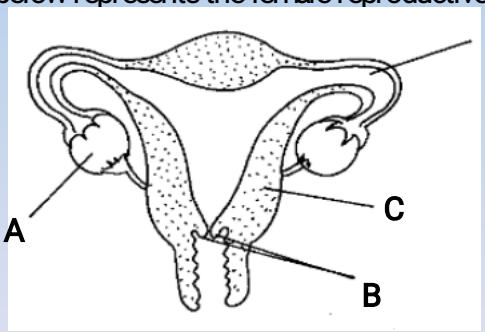
2. In an experiment to investigate an aspect of digestion, two test tubes **P** and **Q** were set up as shown in the diagram below.

Set up **P** Set up **Q**



The test tubes were left in the water bath for 30 minutes. The content of each test tube was then tested for starch using iodine solution.
(a) What was the aim of the experiment? (1mark)
(b) What results were expected in test tube **P** and **Q**. (2marks)
(c) Account for the results you have given in (b) above test tube **P** and **Q** (2marks)
(d) Why was the set up left at 37°C for 30 minutes? (1mark)
(e) Name the carbohydrate stored in (2marks)
(i) Mammalian liver
(ii) Potato tuber

3. The diagram below represents the female reproductive system.



(a) Name the structures labelled **A** and **C** (2marks)
(b) State the conditions that results if implantation occurs at point labelled **D**. (1mark)
(c) Name the hormone secreted by the part labelled **A** and for each give **one** function. (4marks)

(d) What role does part labelled **B** play during pregnancy? (1mark)

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



Grasping twigs. etc (weaver) | Waders (water | Graspin g twigs. etc | Heavy-clawed | Webbed

(a) What type of evolution is illustrated by the limbs? (1mark)

(b) What does the origin of the limbs suggest about the ancestry of these animals? (1mark)

(c) (i) What are the vestigial structures?

(ii) State an example of vestigial structures in human. (1mark)

(d) (i) What is natural selection? (1mark)

(ii) Give **one** example of natural selection in action (1mark)

(e) Explain comparative serology as an evidence of evolution. (2marks)

5. (a) What is blood transfusion ? (1mark)

(b) State **three** precautions to be observed before transfusing blood (3marks)

(c) State the advantage and disadvantage of blood group **O**. (2marks)

Advantage

Disadvantage

(d) (i) What is a universal recipient ? (1mark)

(ii) State the blood group of universal recipient. (1mark)

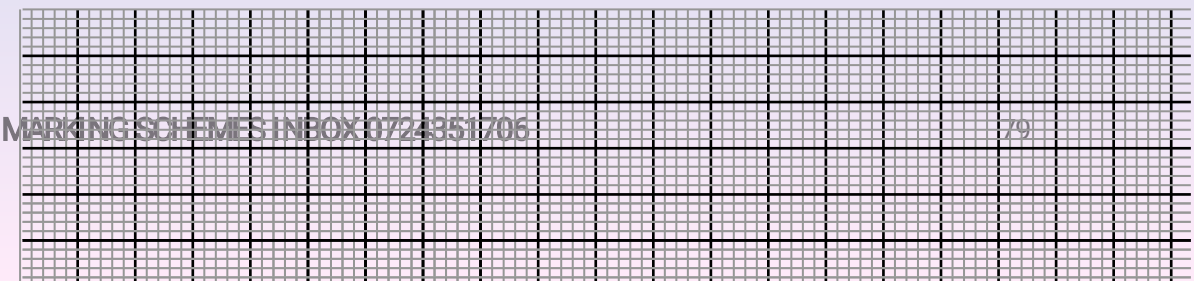
SECTION B (40 MARKS)

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

6. Two persons **A** and **B** drunk volumes of concentrated solutions of glucose. The amounts of glucose in their blood was determined at intervals. The results are shown in the table below.

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

On the grid provided, plot graphs of glucose level in blood against time on the same axes. (7marks)



(a) What was the concentration of glucose in the blood of person **A** and **B** at the 20th minute? (2 marks)

(c) Suggest why glucose level in person **A** stopped rising after 30 minutes while it continued to rise in person **B**. 2marks)

(d) Account for the decrease in glucose level of person **A** after 30 minutes and person **B** after 60 minutes. (4marks)

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

(f) Explain what happens to the excess amino acids in the body. (4marks)

7. (a) Name and state the functions of the cellular components of mammalian blood. (7marks)

(b) What are the functions of the blood plasma in mammals? (13marks)

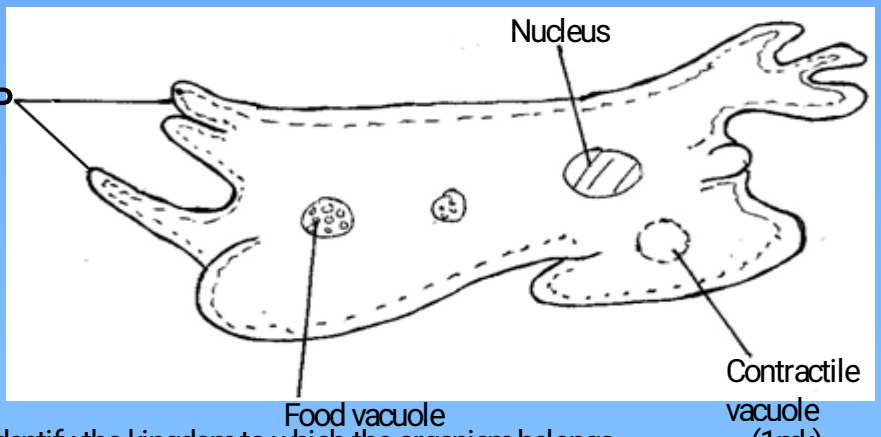
8. Explain how a bony fish is adapted for movement in its habitat. (20marks)

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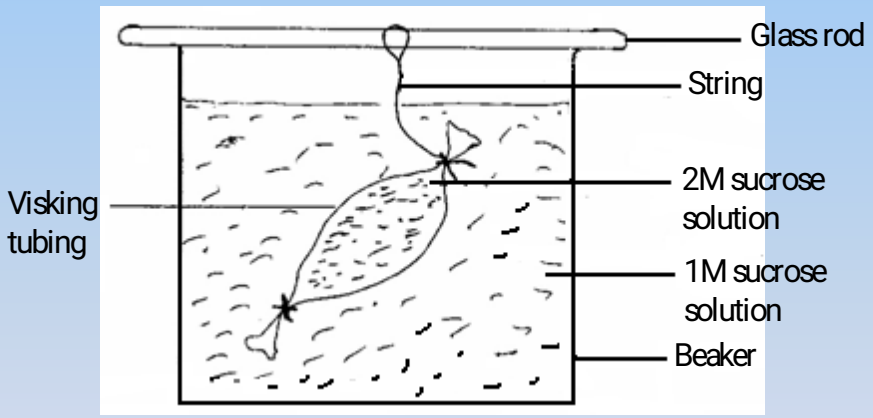
NAIROBI SCHOOL KCSE TRIAL AND PRACTICE EXAM .

BIOLOGY
PAPER 1
(THEORY)
TIME: 2 HOURS

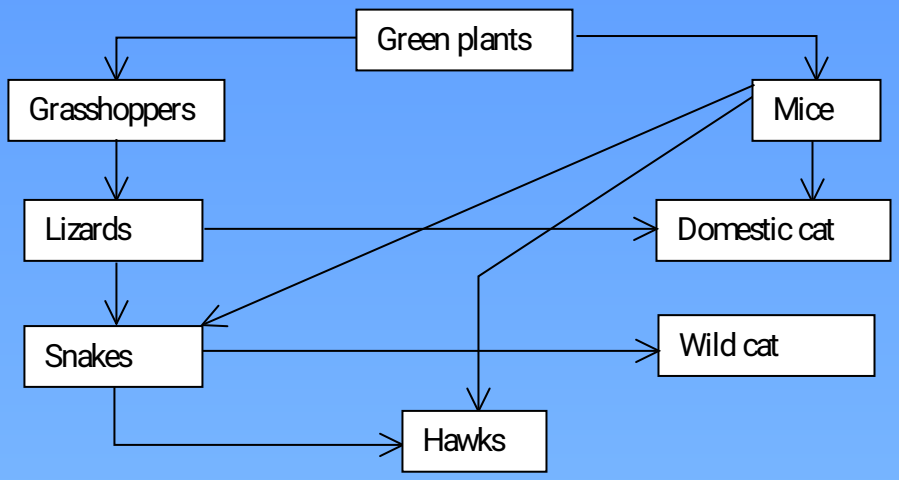
1. (a) Define the term 'parthenocarpy'. (1mk)
   (b) Name **two** plant growth hormones that promote parthenocarpy. (2mks)
2. Name the organelle that performs each of the following functions in a cell
   (i) Protein synthesis. (1mk)
   (ii) Transport of cell secretions. (1mk)
3. The diagram **below** represents a certain organism.



   (a) Identify the kingdom to which the organism belongs. (1mk)
   (b) Identify the part labeled **P**. (1mk)
   (c) What is the function of contractile vacuole? (1mk)
4. Other than carbon (IV) oxide, name other products of anaerobic respiration. (2mks)
5. (a) Name the fluid that is produced by sebaceous glands. (1mk)
   (b) State **two** functions of sweat on the human body. (2mks)
6. (a) State **two** characteristics that are used to divide the phylum arthropoda into classes. (2mks)
   (b) Name the class with the largest number of individuals in the phylum arthropoda. (1mk)
7. Why are people with blood group O referred to as universal donors? (1mk)
8. An experiment was set up as shown in the diagram **below**.



   (a) Which process is being investigated by the above experiment? (1mk)
   (b) State the expected results. (1mk)
   (c) Explain your answer in (b) above. (3mks)
9. (a) What causes the following diseases?
      (i) Diabetes mellitus. (1mk)
      (ii) Diabetes insipidus. (1mk)
   (b) How would you test that someone is a victim of diabetes mellitus in the laboratory. (3mks)
10. The following chart shows a feeding relationship in ecosystem.



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

(b) Which organism has the largest variety of predator in food web? (1mk)

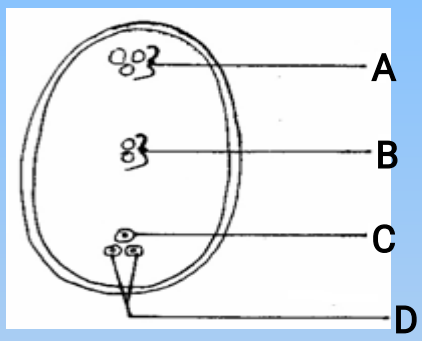
© Suggest **three** ways in which the ecosystem would be affected if there was prolonged drought. (3mks)

11. A man of blood group A and a woman of blood group B get married.

(a) Using a punnet square show the possible blood groups of their offspring's if both of them are heterozygous for their blood groups. (4mks)

(b) What is the probability that one of the children will be blood group O? (1mk)

12. The diagram **below** shows a mature embryo sac of a flowering plant.



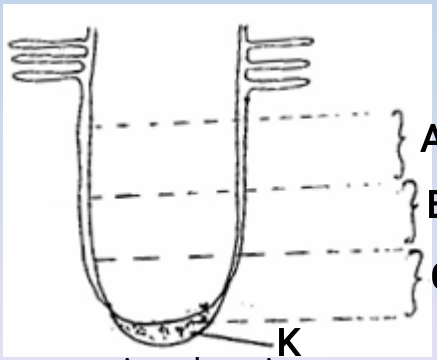
(a) Name the parts labeled **A** and **D**. (2mks)

(b) What is the function of the structure labeled B. (1mk)

13. (a) Name the tissues that transport water in plants. (1mk)

(b) How is the tissue you named in **(a) above** strengthened? (1mk)

14. The diagram **below** shows regions of growth in a root. Study it and answer the questions that follow.



(a)

(b) (1mk)

15. The enzymes pepsin and trypsin are secreted in their inactive forms.

(a) Give the names of these inactive forms. (2mks)

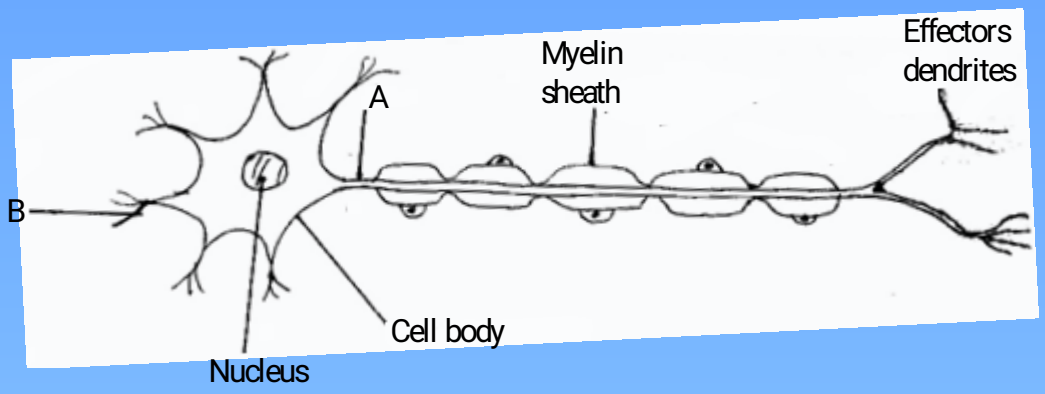
(b) Why are they secreted in an inactive form? (1mk

16. (a) Define the following terms:

(i) Evolution. (1mk)
(ii) Analogous structures. (1mk)

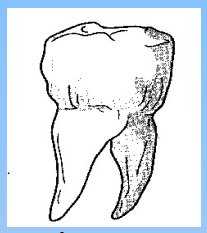
(b) Describe the importance of comparative embryology as evidence of evolution (3mks)

17. Study the diagram **below** of a neurone in human being.



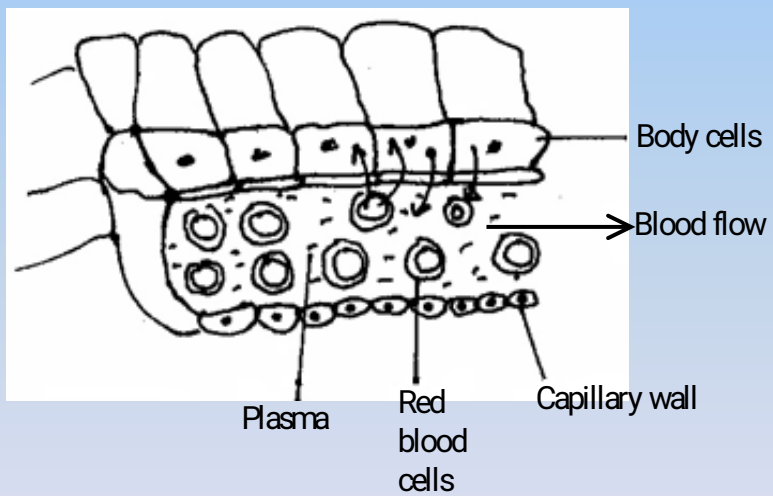
(a) Identify the neurone. (1mk)
(b) Name the parts labeled.
(c) Using an arrow indicate the direction of movement of a nerve impulse along the neurone (1mk)

18. Study the diagram of the mammalian tooth **below** and answer the questions that follow.



(a) Identify the tooth. (1mk)
(b) Give a reason for your answer in (a) above. (1mk)
(c) State **one** adaptation of the tooth to its function. (1mk)

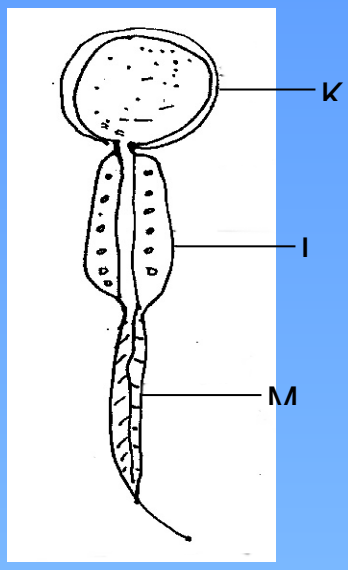
19. The diagram **below** shows gaseous exchange in tissues.



(a) (i) Name the gas that diffuses.
I To the body cells (1mk)
II From body cells(1mk)

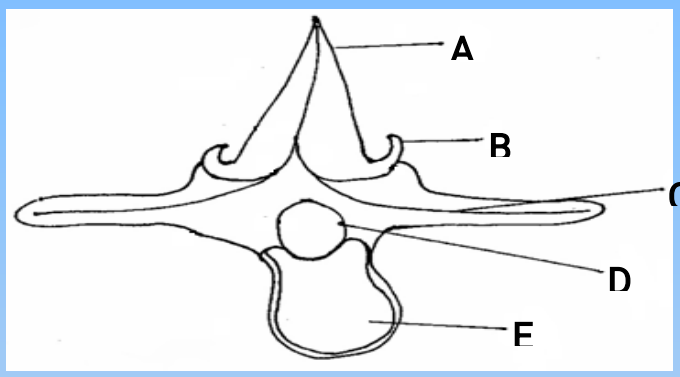
(b) Which compound dissociates to release the gas named in **(a)(i) above**. (1mk)
(c) What is tissue fluid? (1mk)

20. The diagram **below** represents one of the specialized cells found in the human body.



(a) Identify the cell. (1mk)
(b) What is the function of the cell? (2mks)
(c) Name the parts labeled.

21. The diagram **below** represents the anterior view of a certain vertebra shown **below**.



(a) With a reason, identify the type of vertebra shown **above**. (2mks)
(b) Name the parts labeled.
(c) State the function of part **E**. (1mk)

22. Complete the table **below** on mineral nutrition in plants.

Mineral element	Function	Deficiency symptoms
	Synthesis of proteins and protoplasm	Stunted growth and yellowing of leaves
Calcium		
	Forms part of chlorophyll	Yellowing of leaves

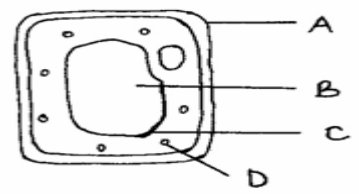
(4mks)

NAIROBI SCHOOL KCSE TRIAL AND PRACTICE EXAM .

Paper 2

SECTION A: (40 MARKS)
Answer ALL the questions in this section in the spaces provided.

1. Examine the diagram **below** and use it to answer the questions that follow.



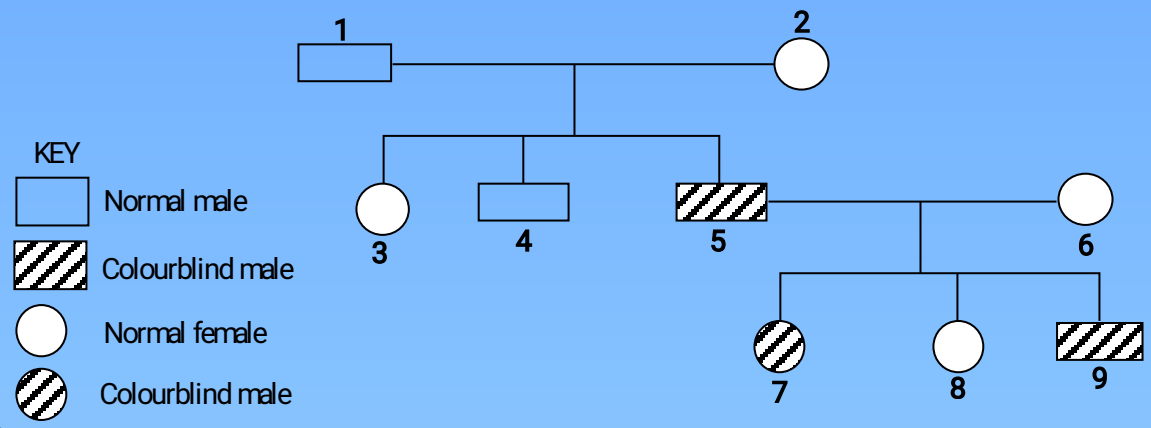
(a) **Name the parts** labeled. (3mks)

(b) What is substance which makes up part labeled **A**? (1mk)

(c) Name the process by which mineral salts move into structure **B**. (1mk)

(d) Explain what happens when a red blood cell is put in distilled water. (3mks)

2. The figure **below** is a pedigree showing the inheritance of colourblindness, a disease transmitted through a recessive gene located on the X-chromosome.

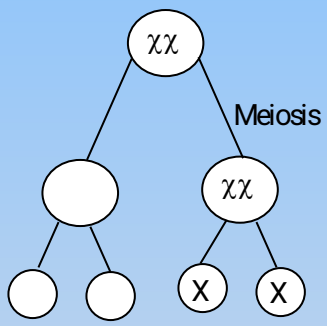


(a) Using the symbol N for normal gene and n for colourblind gene, write down the genotypes of parents **1** and **2**. (2mks)

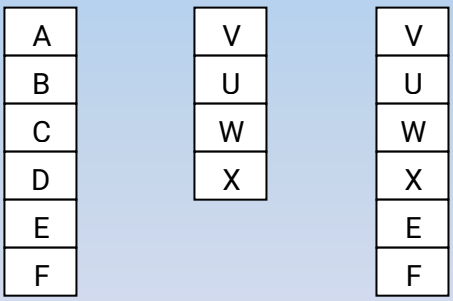
(b) Work out the possible genotypes of the children **3**, **4** and **5**. (4mks)

(c) The diagrams **below** illustrate some chromosome mutations.

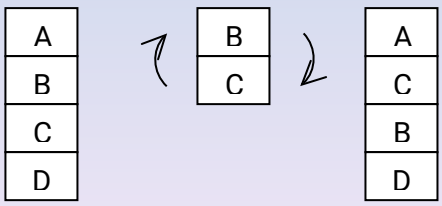
A



B

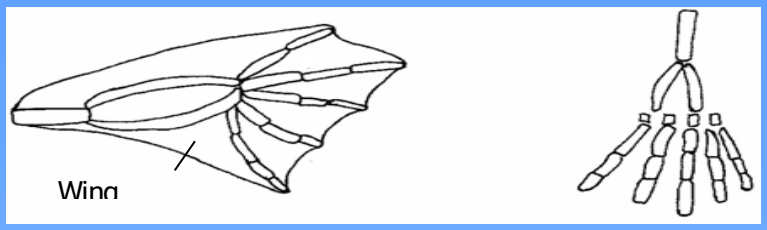


C



Identify the mutations. (3mks)

3. The diagram **below** shows structures of the bat wing and human arm.



(a) These structures are thought to have same ancestral origin. State **one** structural similarity and **one** adaptational difference between the two.

(i) Structural similarity. (1mk)

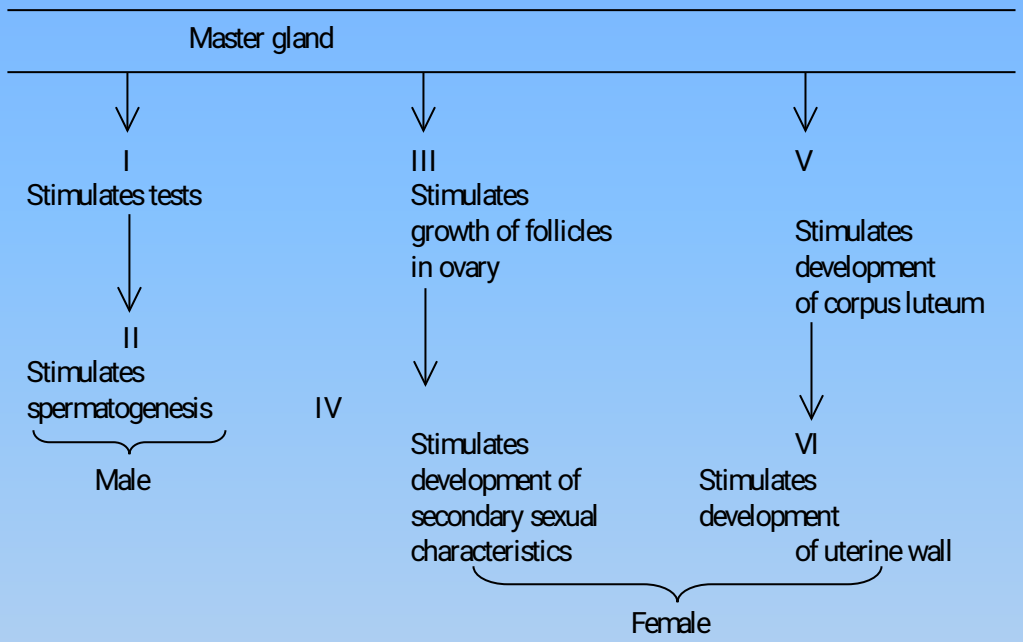
(ii) Adaptational difference. (2mks)

(b) Give **two** other examples of structures in nature that show the type of evolution as in (a) above. (2mks)

(c) Distinguish between the terms 'chemical evolution' and 'organic evolution'. (2mks)

(d) What is the study of fossils called? (1mk)

4. The diagram **below** represents some hormones, their sources and functions in a mammal.



(a) Identify the gland described as master gland. (1mk)

(b) Name the hormones:- (4mks)

(c) Describe the consequences of deficiency of hormone **II** in man. (2mks)

(d) Other than stimulate development of uterine wall, suggest two other functions of hormone **VI**. (2mks)

5. Ascaris lumbricoides is an endoparasite.

(a) Name the genus to which it belongs. (1mk)

(b) State the habitat of the organism. (1mk

(c) State **three** ways in which the organism is adapted to living in its habitat. (3mks)

(d) Mention **three** ways of preventing spread of the parasite. (3mks)

SECTION B:(40 MARKS)

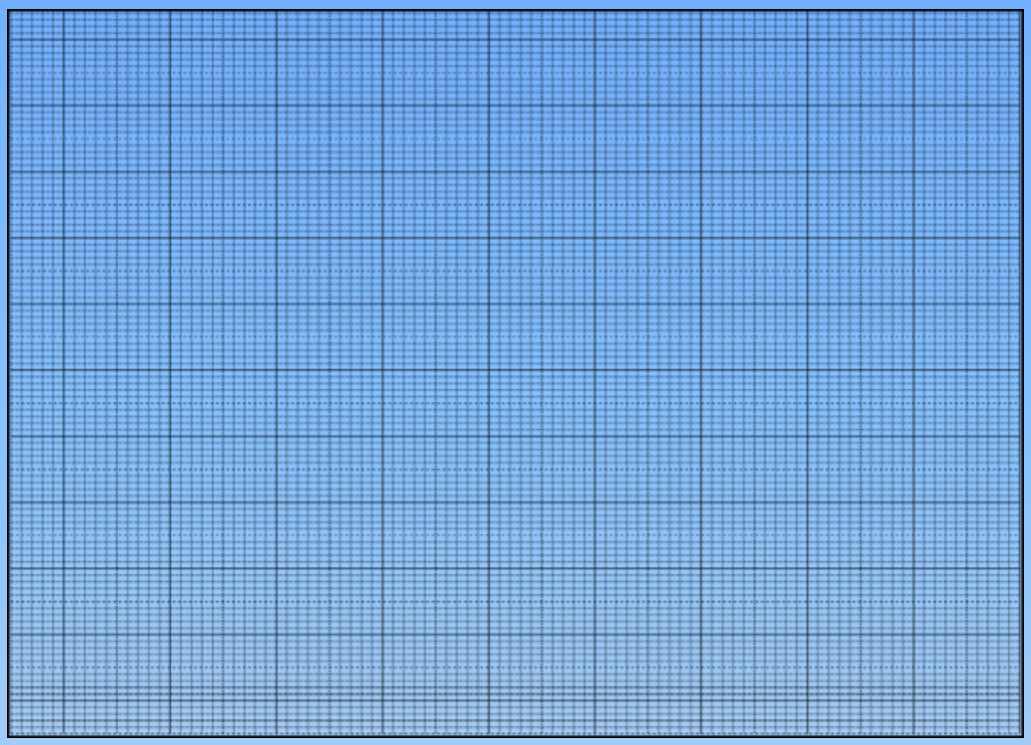
Answer question 6 (compulsory) and EITHER question 7 or 8 in the spaces provided after question 8.

6. The table **below** shows how the quantities of sweat and urine vary with external temperature.

External temperature °C	Urine cm^3/hr	Sweat cm^3/hr
0	100	5

5	90	6
10	80	10
15	70	20
20	60	30
25	50	60
30	40	120
35	30	200

(a) On the same graph, plot the quantities of urine and sweat produced against the external temperature. (7mks)



(b) At what temperature are the amounts of sweat and urine produced equal? (1mk)

(c) What happens to the amount of sweat produced as the temperature rises? Explain the observation. (3mks)

(d) Explain the observation made on the amount of urine produced as the temperature increases. (3mks)

(e) How is the skin adapted for temperature regulation? (6mks)

7. Describe the structural adaptations of the mammalian heart to its function (20mks)
8. Describe how water moves from the soil to the leaves in a tree. (20mks)

FOR MARKING SCHEMES INBOX 0724351706 (MR

CHEPKWONY)