BIOLOGY MOCKS

COMPRISES OF 10 TRIALS OF MOCKS

(BOTH PAPER 1 AND PAPER 2 ARE PRESENT IN EACH TRIAL)

'an investment of knowledge pays'

They have been well prepared by top experienced examiners with respect to the KCSE setting format

(SERIES 1)

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NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

BIOLOGY MOCKS

SERIES 1 TRIAL 1 PAPER 1

Kenya Certificate of Secondary Exams

TIME:2HRS 30 MINS

Answer all questions

1. **(i)** What biological knowledge or study is required in dealing with locusts that infest a maize crop. **(1 mark)**

   (ii) State the functions of the following cell structures. **(2 marks)**

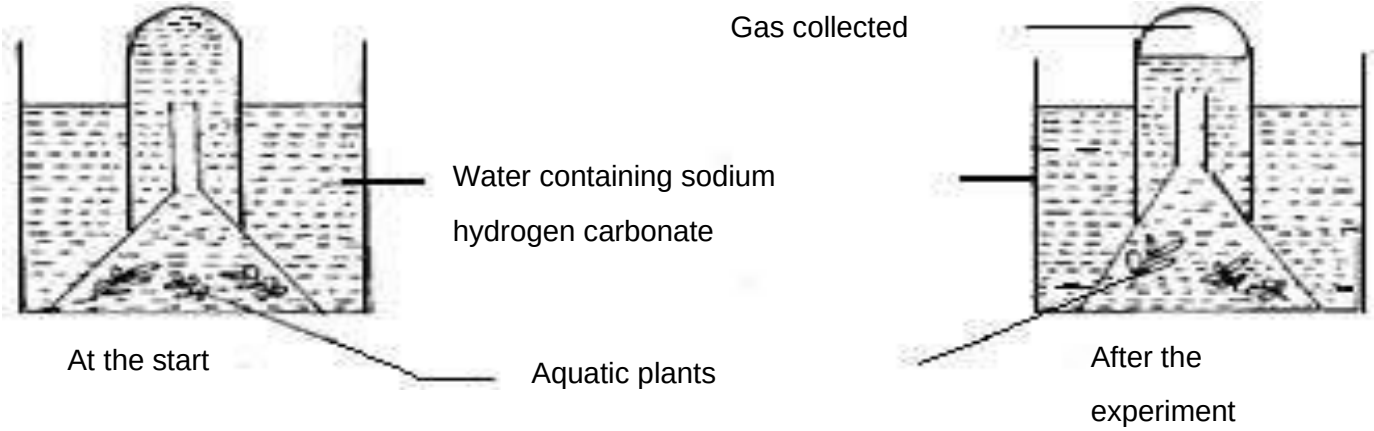
   (a) Sapvacuole.

   (b) Nucleolus.

2. Which **two** classes of phylum arthropoda have their head fused with the thorax**?(2 marks)**
3. **(a)** Name the part of the eye in which the light sensitive cells are located. **(1 mark)**

   (b) List the **two** types of sensory cells found in the part named in (a) above. **(2 marks)**
4. **(a)** Name **two** raw materials for the dark stage process of photosynthesis. **(2 marks)**

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



(a) What gas was collected in the test tube? **(1 mark)**

(b) What was the role of sodium hydrogen carbonate in the experiment? **(2 marks)**

5. State **three** adaptations of the phloem tissue. **(3 marks)**

6. (a) State **one** structural and one functional difference between motor and sensory neurone. **(2 marks)**

(b) What name is given to the gap between the sensory neurone and intermediate neurones**.** **(1 mark)**

(c) Name the transmitter substance found in the gap named in (b) above**.** **(1 mark)**

7. Name **two** enzymes and **one** metal ion that are needed in the blood clotting process. **(3 marks)**

(i) Enzymes-

(iii) Metal ion-

8. Name causative agents of each of the following diseases.

(a) Typhoid

(b) Malaria

9. Name **three** properties of the cell membrane. **(3 marks)**

10.(a) Define the term carrying capacity. **(1 mark)**

(b) The table below gives information about an aquarium community which is ecologically balanced.

Type of organism	**Dry weight (g)**
Insect larvae	500
Fishes	5000
Water plants	5000
Bacteria	10

(c) What do you understand by term ecologically balanced? **(1 mark)**

11. List the changes that takes place during inhalation in the breathing cycle of mammal in the following**.** **(4 marks)**

(a) Ribcage and thoracic cavity.

(b) Diaphragm

(c) External intercostal muscles.

(d) Internal intercostal muscles.

12. Name the fins that prevent the following movements of fish during swimming. **(3 marks)**

(i) Yawing

(ii) Pitching

(iii) Rolling

13.(a) Give an example of a sex linked trait in humans. **(2 marks)**

Y chromosome-

X chromosome-

(b) Write the types of gene mutation represented by the following analogues. **(2 marks)**

(i) Intended message BRING THERMOS ON OUTING

Actual message BRING MOTHERS ON OUTING

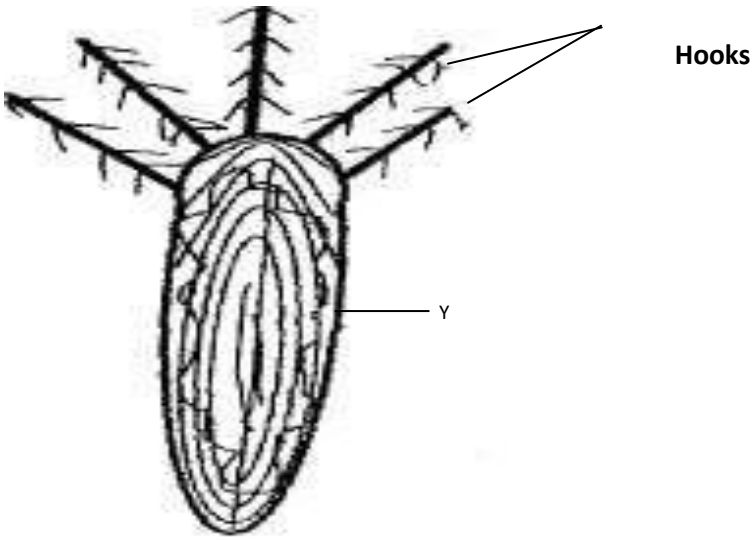
Type :

(ii) Intended message PLEAS SAY WHERE YOU ARE

Actual message PLEASE STAY WHERE YOU ARE

Type :

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

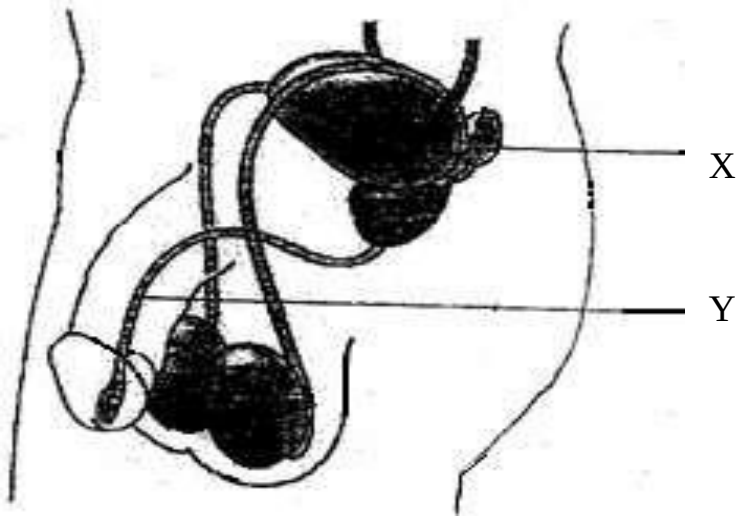


(a) Name structure labelled **Y**. **(1 mark)**

(b)(i) State the agent of dispersal for the structure above. **(1 mark)**

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

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



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

(b) Name **two** substances that pass through structure labelled **Y**. **(1 mark)**

16. Name the type of response shown by: **(3 marks)**

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

(b) Sperms when they swim towards ovum.

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

17. Give **two** reasons why the pressure of blood is greater in the arteries than in the veins in mammals. **(2 marks**)

18. What happens when respiration exceeds photosynthesis in the guard cells of terrestrial plants? **(3 marks)**

19. The leaf of a potted green plant which had been kept in dark for 24 hours was smeared with petroleum jelly on its lower surface and then exposed to sunlight for 6 hours. Starch test on the leaf was negative. Account for the observation.

(2 marks)

20. State the importance of the structure given below in a seed.

(a) Endosperm. **(1 mark)**

(b) Testa. **(1 mark)**

21. (a) State **two** disadvantages of self pollination in plants. **(2 marks)**

(b) Explain why the tube nucleus disintegrates just before reaching the embryo sac.

(1 mark)

22. (a) State the circulatory system found in members of the class insecta. **(1 mark)**

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

(i) Small intestine to the liver.

(ii) Lungs to the heart.

23. Two populations of the same species of birds were separated over a long period of time by an ocean. Both populations initially fed on insects only but later it was observed that one population fed entirely on fruits and seeds although insects were available. Name;

(a) The type of isolation. **(1 mark)**

(b) The type of evolutionary change. **(1 mark)**

(c) What are vestigial structures? **(1 mark)**

(d) Name **one** vestigial structure in man. **(1 mark)**

24. Eight potato cylinder of the same size were used to investigate a certain physiological process. Four of the potato cylinders were placed in solution **S**. The other four potato cylinders were placed in solution **T.** After 2 hours, the potato cylinders from solution S were found to longer and stiff, while those from solution **T** were found to be shorter and flexible. Explain the results in solution **S** and **T.** **(2 marks)**

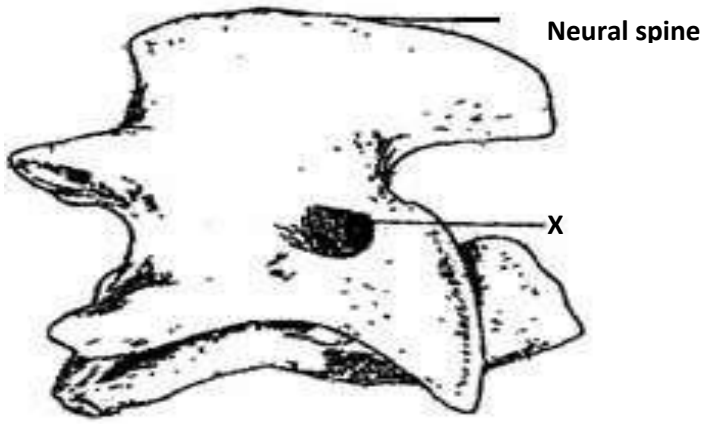
(b) Distinguish between active transport and diffusion. **(2 marks)**

25. Why is the pancreas considered a dual gland? **(2 marks)**

26. List **two** enzyme that are secreted in their precursor forms. **(2 marks)**

27. State **two** effects of gibberellins on shoots of plants. **(2 marks)**

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



(a) Identify the bone illustrated in the diagram. **(1 mark)**

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

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BIOLOGY MOCKS

SERIES 1 TRIAL 1 PAPER 2

Kenya Certificate of Secondary Exams

TIME:2HRS 30 MINS

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

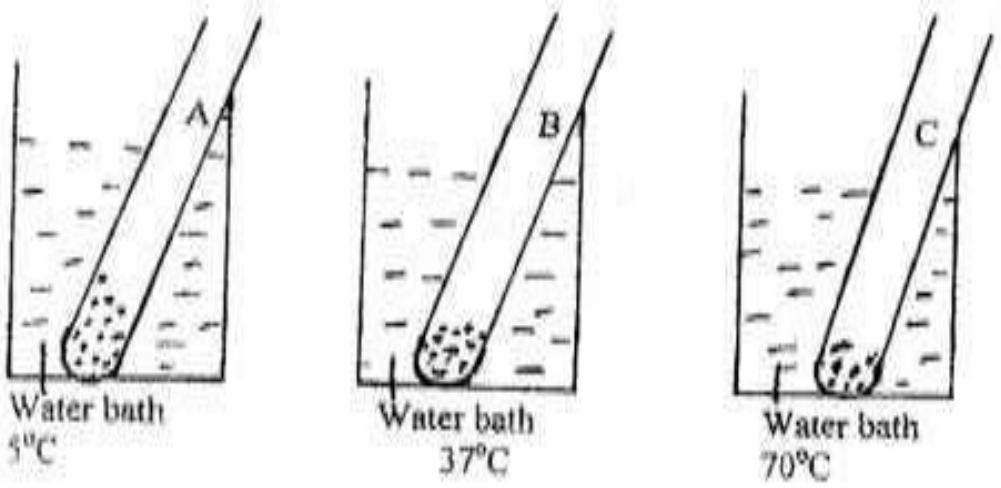
1. Sickle cell anaemia is a hereditary disease due to a recessive gene which changes normal haemoglobin (Hb – A) to abnormal haemoglobin (Hb – S). The red blood cells of people with sickle cell anaemia are sickle shaped.

(a) What are the possible phenotypes of the offsprings of a man who is heterozygous and a woman who is also heterozygous? Show your working. **(5 marks)**

(b) Sickle cell trait is more prevalent in tropical countries than in temperate countries. Give an explanation for this observation.

(3 marks)

2. Three tubes each containing 1ml saliva and 1ml water were incubated in water baths at different temperatures as shown in the diagram below for 30 minutes. Another one tube containing 1ml starch solution was incubated for the same length of time in each water bath. The contents of the two tubes in each water bath was then mixed and incubated for further 30 minutes. The content of each tube was then tested for starch using iodine solution.



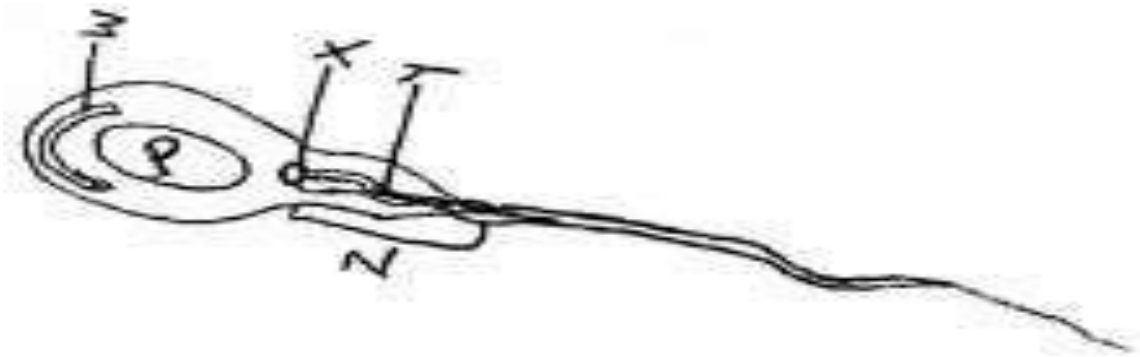
(a) What was the aim of the experiment? **(1 mark)**

(b) Why was it necessary to incubate the tubes for 30 minutes before mixing their contents? **(1 mark)**

(c) State the colour changes you would expect to observe after adding iodine solution. **(3 marks)**

(d) Account for the expected observations. **(3 marks)**

3. Below is a diagram of a sperm cell.



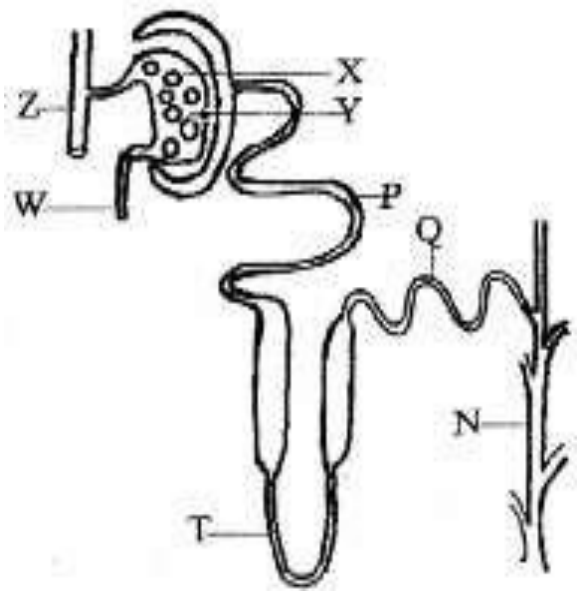
(a) Identify parts labeled **X** and **Y**. **(2 marks)**

(b) Explain how parts **W** and **Z** adapt the cell to its function. **(4 marks)**

(c) Using letter **P** identify or label on the diagram the part of the cell rich in DNA. **(1 mark)**

(d) State the function of part **X**. **(1 mark)**

4. The figure shown below represents a kidney nephron. Use it to answer the questions that follow.



(a) (i) X is made up of a tuft of capillaries. How do they differ from other capillaries in the body? **(1 mark)**

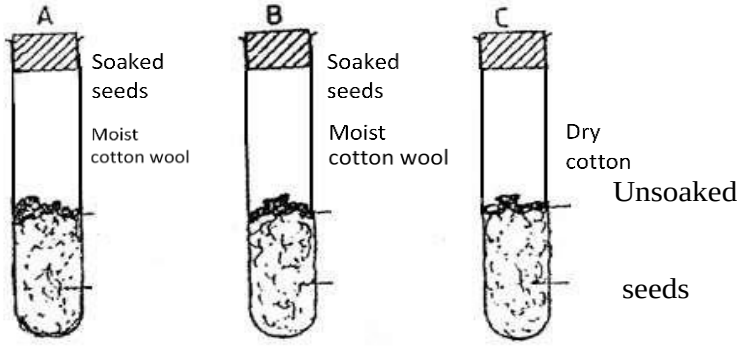
(ii) What structural difference exist between **W** and **Z**? **(1 mark)**

(iii) State the significance of the difference stated in (a) (ii) above. **(1 mark)**

(b) State **three** adaptations that enable **P** to perform its function. **(3 marks)**

(c) What is counter flow and in which part of the nephron does it occur. **(2 marks)**

5. The diagrams below represent a set up to investigate the conditions necessary for seed germination.



At room temperature | At O□C | At room temperature

The set was left for 7 days.

(a) What conditions were being investigated in the experiment? **(2 marks)**

(b) State **three** reasons for soaking seeds in set ups **A** and **B**. **(3 marks)**

(c) What were the expected results after seven days? **(3 marks)**

Step A

Step B

Step C

SECTION B: (40 MARKS)

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

6. An experiment was carried out to investigate the effect of hormones on growth of lateral buds of three pea plants.The shoots were treated as follows.

(a) Shoot **A –** Apical bud was removed.

(b) Shoot **B –** Apical bud was removed and gibberellic acid placed on the cut shoot.

(c) Shoot **C –** Apical bud was left intact.

The lengths of the branches developing from the lateral buds were determined at regular intervals. The results obtained are shown in the table below.

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

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

(ii) (a) What was the length of the branch in Shoot B on the 7^{th} day? **(1 mark)**

(b) What would be the expected length of the branch developing from Shoot B on the 11^{th} day?

(iii) Account for the results obtained in the experiment. **(6 marks)**

(iv) Why was Shoot C included in the experiment? **(1 mark)**

(v) What is the importance of gibberellic acid in agriculture? **(1 mark)**

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

7. Describe the role of hormones in the mammalian female reproductive cycle. **(20 marks)**

8. Explain how structures of the human ear are adapted to their functions. **(20 marks)**

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BIOLOGY MOCKS

SERIES 1 TRIAL 2 PAPER 1

Kenya Certificate of Secondary Exams

TIME:2HRS 30 MINS

Answer all questions

1. State the importance of each of the following in living organisms. **(2 marks)**

i)Respiration

ii) Reproduction

2. State function of the following in seed. Germination. **(3 marks)**

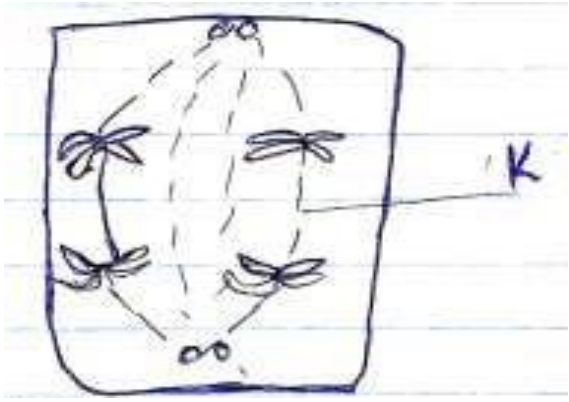
i) Water

ii) Enzymes

iii) Oxygen

3. Distinguish between identical twins and fraternal twins. **(2 marks)**

4. The diagram below represents a stage during cell division.



i) Identify the stage of cell division. **(1 mark)**

ii) Give two reasons for your answer (a) above. **(2 marks)**

iii) Name the structures labeled K. **(1 mark)**

5. State three roles of Gibberellins hormone in plant. **(3 marks)**

6. **(i)** The diameter field of view of a light microscopic is 6.5mm. Plant cells lying across the diameter are 12.Determine the size of one cell in micrometers. **(2 marks)**

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

7. Distinguish between diffusion and osmosis. **(2 marks)**

8. State the changes that occur in a nerve axon to produce an action potential. **(3 marks)**

9. **(i)** Name the gaseous exchange surface in insects. **(1 mark)**

(ii) State two ways the surface named in (a) above is suited to its function. **(2 marks)**

10. $5C_{51}\ H_{98}\ 0_6 + 145\ O_2 \longrightarrow 102\ CO_2 + 98\ H_2O$

The above equation shows an oxidation reaction of food substances.

a) What do you understand by the term respiratory quotient? **(1 mark)**

b) Determine respiratory quotient of the oxidation of food substances. **(1 mark)**

c) Identify the food substances. **(1 mark)**

11. State one function of each of the following parts of a mammalian ear.

a) Pinna **(1 mark)**

b) Tympanic membrane **(1 mark)**

c) Vestibule **(1 mark)**

12. State one structural and one functional difference between motor and sensory neurones. **(2 marks)**

Structural-difference –

Functional-difference –

13. **i)** Distinguish between a community and a population **(2 marks)**

ii) State two measures that can be taken to control infection of man by protozoan parasites. **(2 marks)**

14. **i)** Pregnancy continues if the ovary of an expectant mother is removed after 4 months. Explain. **(2 marks)**

ii) What is the role of testes in the mammalian reproductive system? **(2 marks)**

15. i) State two ways in which skeletal muscles fibres are adapted to their function. **(2 marks)**

a) (i) Name the class of the section was obtained. **(1 mark)**

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

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

ii) State two structural differences between biceps muscles & muscles of the gut.
(2 marks)

16. a) Explain why Lamarck's theory of evolution is not accepted by biologists today.
(2 marks)

b) State two pieces of evidence that support the theory of evolution.

17. The diagram below shows a section through plant organ. **(2 marks)**



(i) What class the plant belong **(1 mk)**

(ii) Give reasons for your answer **(2 mks)**

18. The following is a dental formula of a dog and rabbit, state two differences between them. **(2 marks)**

$$\text{Dog: } I\ \frac{3}{3}\quad C\ \frac{1}{1}\quad PM\ \frac{4}{4}\quad M\ \frac{2}{3}$$

$$\text{Rabbit: } I\ \frac{2}{1}\quad C\ \frac{0}{0}\quad PM\ \frac{3}{2}\quad M\ \frac{3}{3}$$

19. The figure below illustrates a portion of a chromosome with genes named **A, B, C, S, Q** and **R**

A	B	C	S	Q	R

Use the diagrams similar to the one above to illustrate the changes if the above chromosome undergoes the following mutations affecting only gene C and S.

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

(ii) Inversion **(1 mks)**

20. Name the disease characterized by

Glycosuria **(2 marks)**

Diuresis **(1 mark)**

21. State the importance of each of the following features in animals;

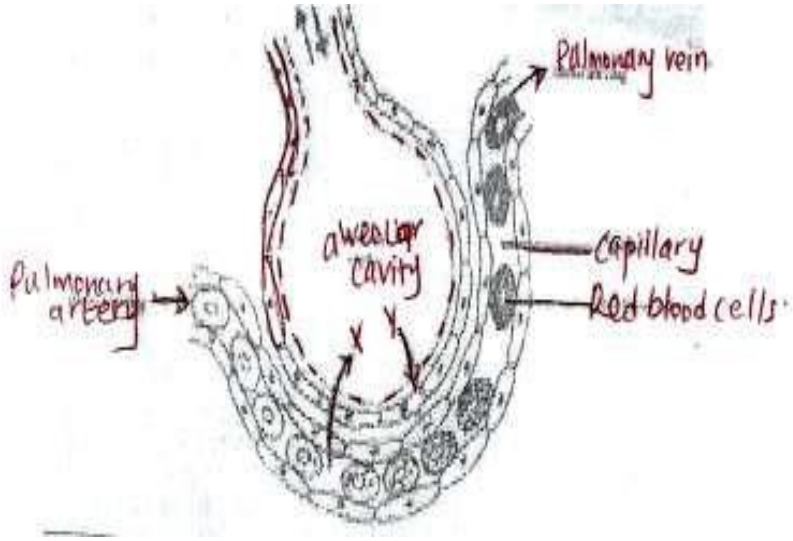
a) Solid food being broken down into small pieces.

b) Presence of caecum in herbivorous mammals.

22. ance that accumulates in muscles when respiration occurs with insufficient oxygen.

(1 mark)

23. The diagram below represents gaseous exchange in the alveolus **(2 marks)**

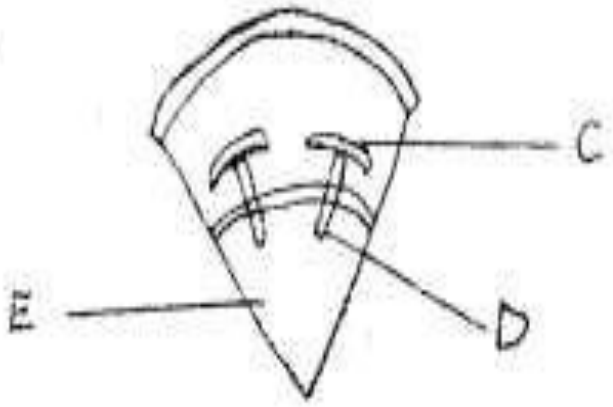


a) Mention the path followed by gas y from alveolar space until it reaches the red blood cells.

24. Explain how water from the soil is gained by root hair in plants. **(2 marks)**

25. In what form is carbon IV oxide transported in blood. **(1 mark)**

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



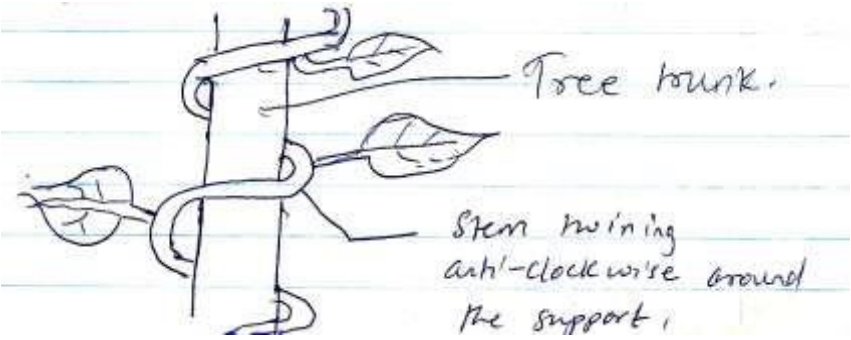
Name the type of cells found in part labeled **E.** **(1 mark)**

27. State three features that a grasshopper, a crab, a spider and a millipede have in common. **(3 mark)**

28. State two characteristics of Eukaryotes**.** **(2 marks)**

29. A cell organelle can be thought of as a ―bag‖ full of ―liquid‖, the ―liquid‖ being the ―background‖ substance that holds other structures within the ―bag‖.
Distinguish between the ―background‖ substance of a mitochondria and that of a chloroplast. **(2 marks)**

30. The figure below shows a stem of a plant growing round a tree trunk



a) What is the name of the response which causes such a twisted growth? **(1 mark)**

b) Explain how twisting process is accomplished **(2 marks)**

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BIOLOGY MOCKS

SERIES 1 TRIAL 2 PAPER 2

Kenya Certificate of Secondary Exams

TIME:2HRS 30 MINS

Answer all questions

1. The genetic disorder hemophilia is due to a recessive sex linked gene .A man who is hemophilia marries a woman who is carrier for the condition.

   a) Using letter H to represent the normal condition and letter h for the hemophiliac condition.

   i) What is the genotype for the man and the woman**?** **(2marks)**

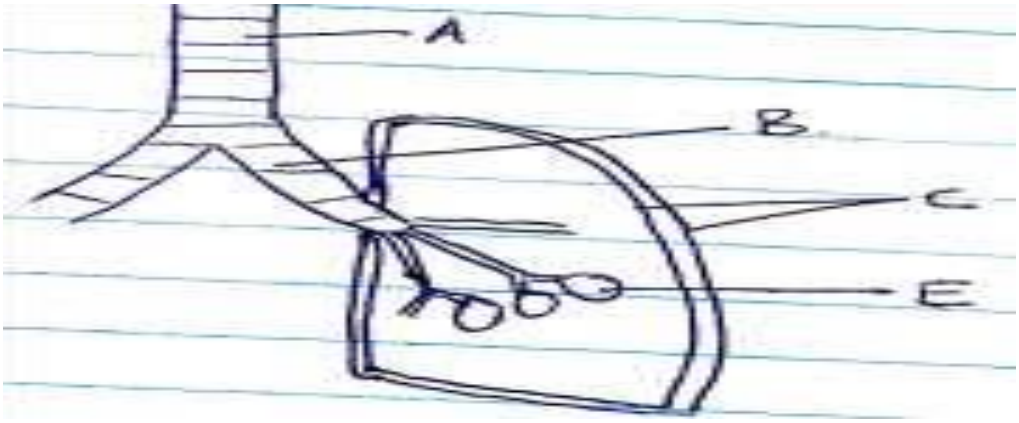
   ii) Work out a cross between the man and woman **(3marks)**

   b) What is the chance that both the first and second sons will be hemophiliac?

   (2marks)

   c) Hemophiliac is more common in males than in female human .Explain **(1mark)**

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



   a) Name the part labeled **A** and **B** **(2marks)**

   b) State the function of the part labeled C **(2marks)**

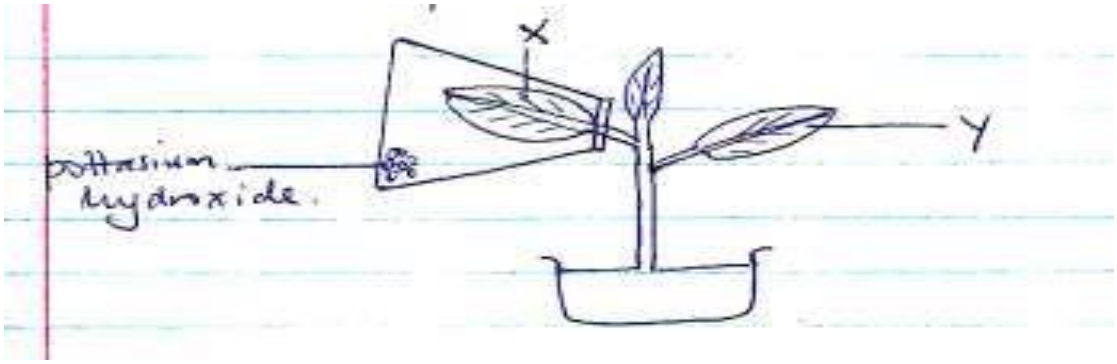
c) How is he part labeled E adapted to its function **(2marks)**

d) Indentify the structure that perform the same function as one illustrated above in **(2marks)**

i) Amoeba

ii) Fish

3. A health plant was kept in the dark for 48 hrs .Then one of its leaves (x) was enclosed in a glass flask as down below .The whole plant was then returned to light



a) After 48 hrs the leaves were tested for starch .What observations do you expect. **(2marks)**

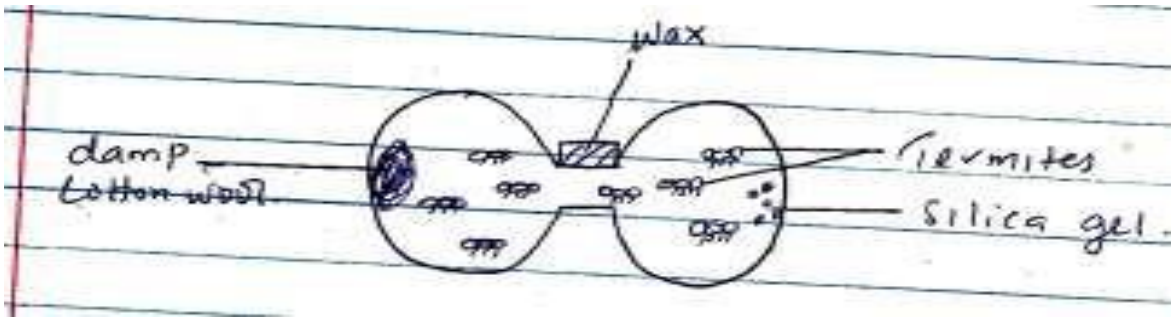
b) i) What conclusions can you draw from this observation **(1mark)**

ii) Explain your conclusion in b **(i)** above **(2marks)**

c) Why was the plant kept in the dark for 48 hrs **(1mark)**

d) State two ways in which the green leaves are adapted for gaseous exchange **(2marks)**

4) The set up below was used to demonstrate a certain behavior of termites



a) State the function of the following in this experiment

i) Damp cotton wool **(1mark)**

ii) Silica gel **(1mark)**

iii) Wax **(1mark)**

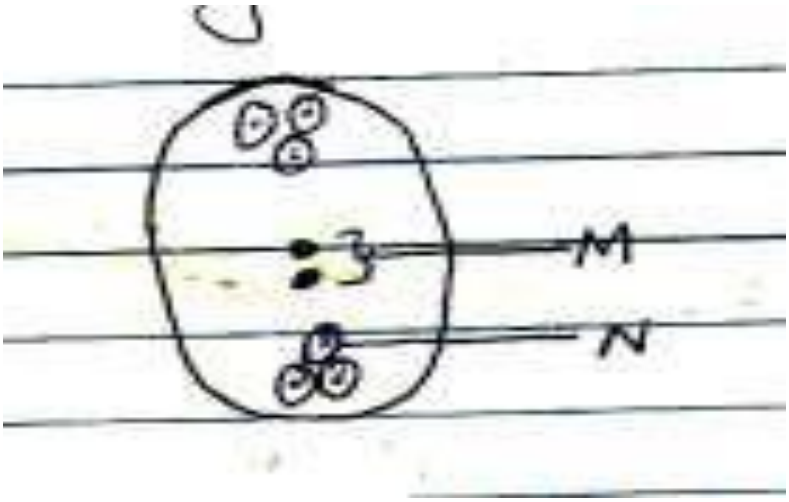
b) What result were obtained from this experiment after 12 hrs **(1mark)**

c) Account for the results in (b) above **(1mark)**

d) Name the type of response shown by termites **(1mark)**

e) What material wound is missing in a control experiment **(2marks)**

5 Below is a diagram of a structure found in plants



a (i) Indentify the structure **(1mrk)**

(ii) Name the parts labeled **M** and **N** **(2mrks)**

b) Explain why cross pollination is more advantageous to a plant species than self – pollination **(2marks)**

c) Explain how double fertilization takes place in the above structure. **(3marks)**

SECTION B;(40 MRKS)

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

6 An investigation of haemolysis of human red blood cell was carried out .Red blood cells were placed in sodium chloride solution and percentage of haemolysed cell established.

Sodium chloride conce .g/cm^3(%)	0.33	0.36	0.38	0.39	0.42	0.44	0.48
Haemolysed red blood cells (%)	100	91	82	69	30	15	0

a) (i) Using the data above, plot a graph of haemolysed red blood cell against salt concentration **(6marks)**

(ii) At what percentage of sodium chloride was the number of haemolysed cells equal to those that are not haemolysed. **(1mark)**

(iii) What is the percentage of cells haemolysed at salt concentration of 0.45 percent. **(1 mark)**

b) Account for the result obtained at

i) 0.33% salt concentration **(2marks)**

ii) 0.48% salt concentration **(2marks)**

iii) Suppose the red blood cells were placed in 0.50%salt concentration .Explain what would happen **(2marks)**

c) i) Distinguish between lymphocytes and phagocytes **(2marks)**

ii) State two ways in which white blood cells defend the body against infections. **(2 marks)**

d) State two adaption of red blood **(2marks)**

7 **a)** Explain the role of the following hormones in growth and development of plants.

(i) Auxins **(4marks)**

(ii) Gibberellins **(4marks)**

8 Explain the adaptation of the small intestine to their functions. **(20marks)**

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BIOLOGY MOCKS

SERIES 1 TRIAL 3 PAPER 1

Kenya Certificate of Secondary Exams

TIME:2HRS 30 MINS

Answer all questions

1. What do the following branches of Biology entail**?** **(2marks)**

(a) Cytology

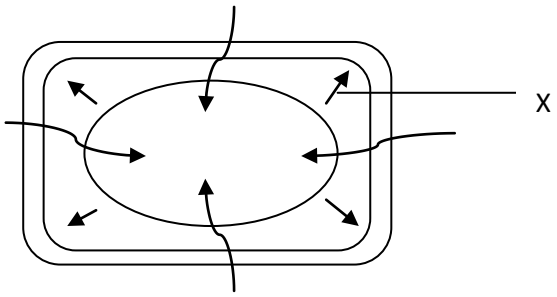
(b) Entomology

2. State TWO characteristics of kingdom Monera that are not found in other kingdoms. **(2marks)**

3. Two species in an ecosystem cannot occupy the same niche. Explain**.** **(1 mark)**

4. State the significance of metamorphosis to the life of insects**.** **(2 marks)**

5. The diagram below shows results of what happens to plant cell when placed in a certain solution.



a) What was the nature of the solution in which the cell was placed**?** **(1 mark)**

b) Identify the force represented by the arrow X and explain how it develops. **(2 marks)**

6. Which organelle would be numerous in the following cells**:** **(2 marks)**

a) Liver cell

b) Palisade cell

7. The scientific names of three animals leopard, wolf and lion in the family carnivora are; Panthera pardus, Canis lupas and Panthera leo respectively.

a) Why are scientific names given in Latin? **(1 mark)**

b) What does *Canis* refer to? **(1 mark)**

c) Giving a reason, state the organisms that are MOST closely related. **(1 mark)**

8. The word equation below shows a biological process.

Water ⟶ Hydrogen atom + oxygen

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

b) Where does the process named in a) above take place? **(1 mark)**

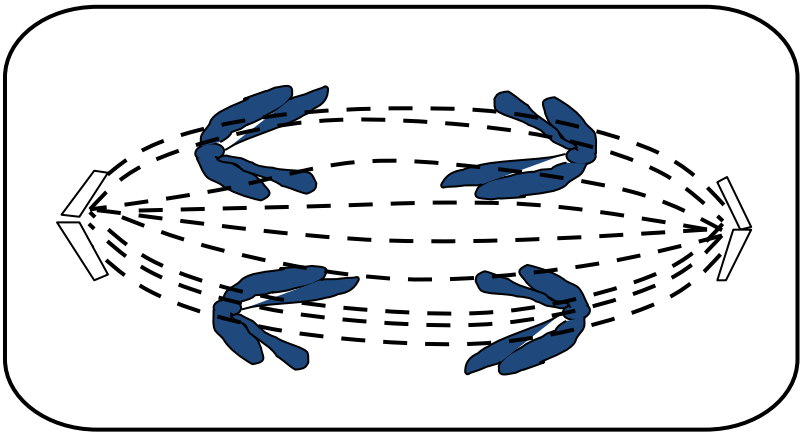
c) State two conditions necessary for the process to occur**.** **(2 marks)**

9. a) What is the importance of heartbeat in blood circulation**?** **(1 mark)**

b) If the nerve supply to the heart of a mammal is servered, the rhythmic heart movement will still go on and the heart continues to beat. Explain this observation. **(1 mark)**

10. The ovaries of an expectant woman can be removed after the first four months of pregnancy without terminating the pregnancy. Explain. **(2 marks)**

11. The diagram below represents a stage during cell division.



a) Name the stage of cell division**.** **(1 mark)**

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

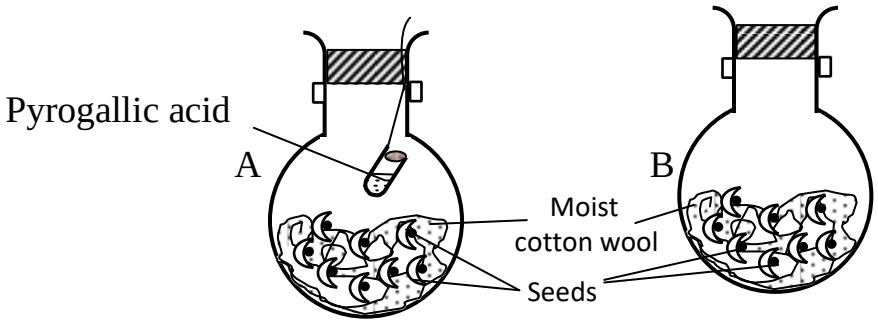
c) State the significance of this stage of cell division in living organisms. **(1 mark)**

12. Name the causative agent for the following diseases;

a) Typhoid **(1 mark)**

b) Syphilis **(1 mark)**

13. A student set up an experiment as shown in the diagram below. The set up was kept at room temperature for one week.



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

b) State the expected observation at the end of the experiment**.** **(2 marks)**

c) Account for the observation made in set up A. **(1 mark)**

14.a) Name the respiratory surface for gaseous exchange in insects**.** **(1 mark)**

b) State two adaptations of the site named in a) above. **(2 marks)**

15.A portion of a nucleic acid is shown below;

-S–P–S -P-S-P-S-P-S-P- S -

C	**C**	**G**	**U**	**G**	**C**	

a) Name the nucleic acid to which the portion belongs. Give a reason. **(2 marks)**

b) Write down the sequence of bases of a complimentary strand to the one above. **(1 mark)**

16. Explain the meaning of the following terms;

a) Basal Metabolic **(1 mark)**

b) Oxygen **(1 mark)**

17. In an experiment, the concentration of ions in the cell sap of reeds growing in a swampy area and the water in the swamp were determined. The data below was obtained. Study it and answer the questions that follow:

Sample	Na^+	Mg^{2+}	Cl^-	SO42-
Cell sap	50	11	101	13
Swamp water	1.2	30	10.2	0.67

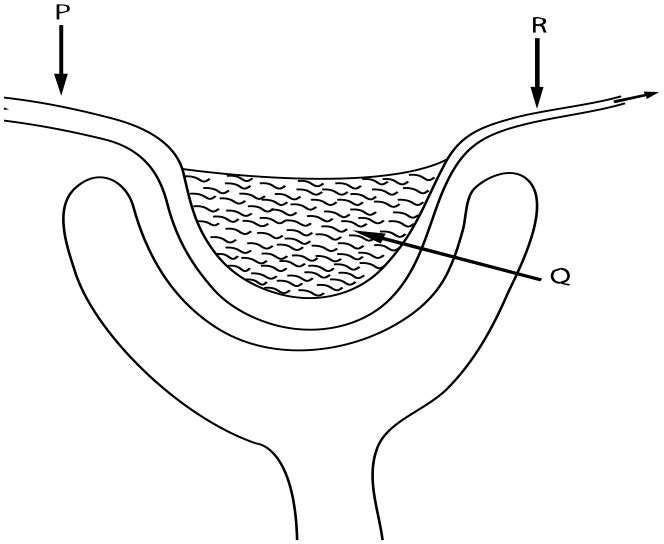
a) Name the process by which uptake of the following ions by the reeds occurs. **(2 marks)**

Na^+ ions

Mg^{2+} ions

b) What effect would reduced oxygen supply have on the uptake of sulphate ions? Explain your answer**.** **(2 marks)**

18. The diagram below shows a part of a nephron.



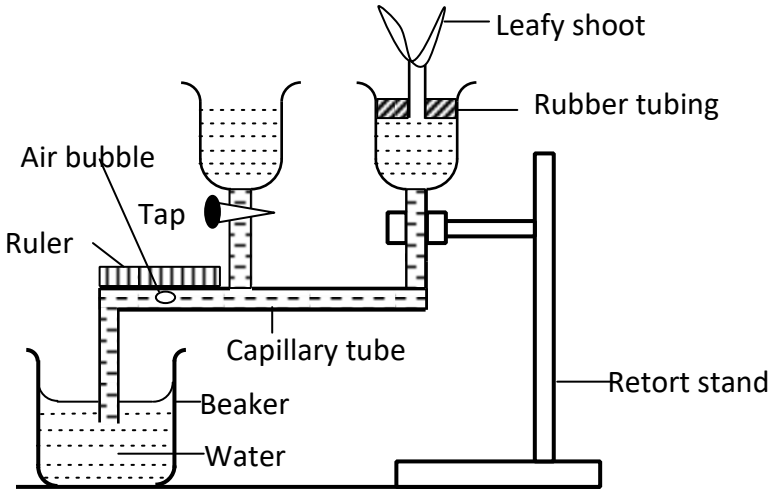
a) State **TWO** differences in composition of blood in parts P and R. **(2 marks)**

b) State a characteristic feature of blood capillaries in part Q that is not found in other capillarities **(1 mark)**

19.(a) Name two types of light sensitive cells found in the human eye. **(1 mark)**

(b) State ONE functional difference between the cells you have named in a) above. **(1 mark)**

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



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

b) Giving a reason, state one precaution that should be taken when setting up this experiment. **(1 mark)**

(c) How would changes in temperature affect the rate of movement of the air bubble**?** **(1 mark)**

21. Julie observed eight onion epidermal cells across the field of view of a light microscope. If the field of view was 4mm in diameter, estimate the average size of the cells in micrometers (1mm= 1000μm). **(2 marks)**

22. How is support brought about in herbaceous plants? **(2 marks)**

23. State the functions of the following parts of the mammalian ear.

a) Eustachian tube **(1mark)**

b) The utriculus and sacculus **(1mark)**

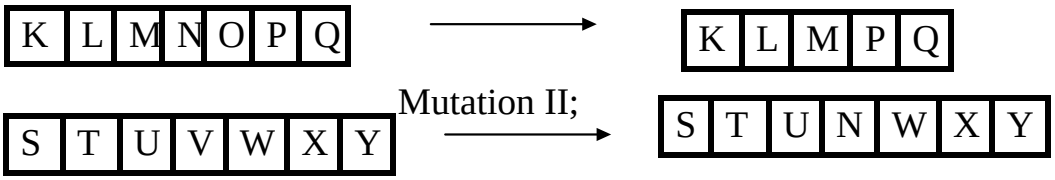
24. In an experiment, a shoot of maize seedling was exposed to light on one side. It was observed that it grew bending towards the direction of the source of light.

a) Explain how the bending towards light occurs. **(2marks)**

b) State the survival value of the response named in a) above. **(1 mark)**

24. The diagram below show various types of gene mutations.

Mutation I; **(1 mark)**

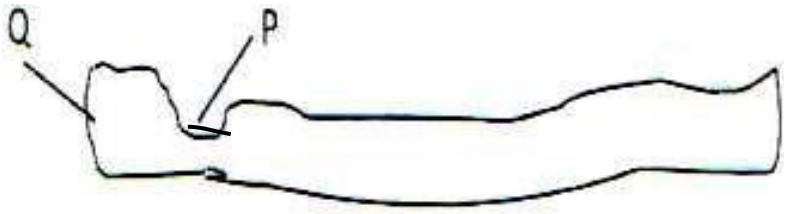


ii) Name one disorder that results from gene mutation **II** **(1 mark)**

26. State THREE adaptations of a leaf to gaseous exchange. **(3 marks)**

27. Distinguish between analogous structures and homologous structures. For each structure give an example. **(2 mks)**

28. The diagram below shows a bone that was obtained from a mammal. **(4 marks)**



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

b) i) Name the type of joint formed at the part marked P. **(1 mark)**

ii) State one characteristic of the joint named in b) i) above. **(1 mark)**

29. What is the importance of the pollen tube in fertilization in plants? **(1 marks)**

30. **a)**The action of pepsin stops in the duodenum. Explain. **(2 marks)**

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

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BIOLOGY MOCKS

SERIES 1 TRIAL 3 PAPER 2

Kenya Certificate of Secondary Exams

TIME:2HRS 30 MINS

Answer all questions

1. (a) Name the organelles that perform each of the following functions in a cell. **(4 marks)**

(i) Synthesis of proteins

(ii) Transport cell secretions

(iii) Destroy old and worn out organelles or even the entire cell.

(iv) Package and transport glycoproteins.

(b) Using a light microscope, a student counted 55 cells across a field of view whose diameter was 6000□m.

Calculate the average length of the cells. Show your working. **(3 marks)**

(c) Why is it recommended to keep the stage of the microscope dry. **(1 mark)**

2. In a certain plant species which is normally green, a recessive gene for colour (n) causes the plant to be white when present in a homozygous state. Such plants die at early age. In heterozygous state, the plants are pale green in colour but grow to maturity.

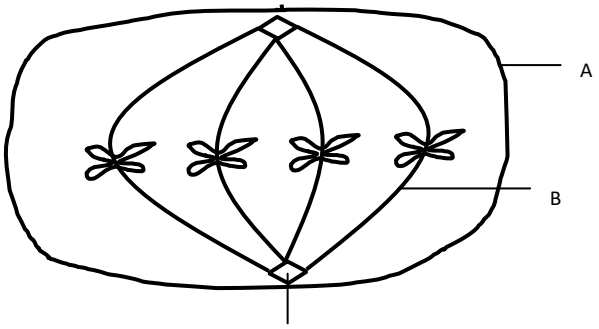
(a) Suggest a reason for the early death of plants with homozygous recessive gene. **(2 marks)**

(b) If a normal green plant was crossed with a pale green plant, what would be the genotype of the F1 generation? (Show your working) **(3 marks)**

(c) If seeds from the heterozygous plants were planted and the resulting plants allowed to self pollinate. Workout the phenotypic ratio of the plants that would grow to maturity. **(2 marks)**

(d) Give an explanation for occurrence of the pale green colour in heterozygous plants. **(1 mark)**

3. The diagram below represents a state in cell division. Study it and answer the questions below.



(a) Name the stage of cell division illustrated in the diagram above. **(1 mark)**

(b) Name the parts labelled A, B and C **(3 marks)**

(c) State **THREE** differences between mitosis and meiosis. **(3 marks)**

d) Name the process during which the exchange of genetic materials occur at prophase 1 of meiosis. **(1mark)**

4. **(a)** Describe how the quadrant method can be used to estimate the population of various species of plants in a given habitat.

(3 marks)

(b) To estimate the population size of beetles in an ecosystem, traps were laid at random. 400 beetles were caught, marked and released back into the ecosystem. A week later traps were laid again and 374 beetles were caught. Out of the 374 beettles, 80 were found to have been marked.

(i) Calculate the population size of the beetles in the ecosystem. **(2 marks)**

(ii) State **TWO** assumptions that were made during the investigation. **(2 marks)**

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

(1 mark)

5. The table below shows the approximate distribution of blood groups in a sample of 100 people in a population.

Blood group	**Frequency**	**Rhesus +ve**	**Rhesus -ve**
A	**26**	**22**	**4**
B	**20**	**18**	**2**
AB	**4**	**3**	**1**
O	**50**	**43**	**8**

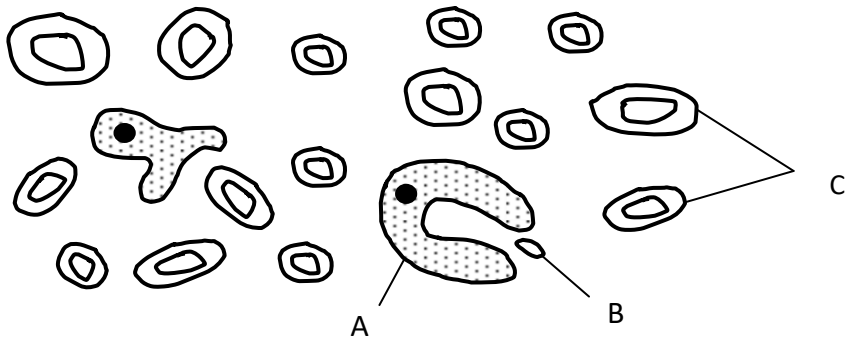
(a) Calculate the percentage of Rhesus negative (Rh-ve) individuals in the population? **(1 mark)**

(b) Account for

(i) The large number of blood group O individuals in a population. **(2 marks)**

(ii) The small number of individuals with blood group AB. **(2 marks)**

(c) The diagram below represents a blood smear on a glass slide.



(i) State the importance of structure C being large numbers in the blood smear. **(1 mark)**

(ii) Give a reason why structure C would be found in large numbers in high altitude than in low altitude. **(1 mark)**

(iii) Name the process by which structure A would engulf structure B. **(1 mark)**

SECTION B: 40 (MARKS)

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

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

	Amount of water in grammes	
Time of day	**Transpiration**	**Absorption**
1100-1300	33	20
1300-1500	45	30
1500-1700	52	42
1700-1900	46	46
1900-2100	25	32

2100-2300	16	20
2300-0100	08	15
0100- 0300	04	11

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

(b) At what time of the day was the amount of water the same for transpiration and absorption. **(1 Mark)**

(c) Account for the shape of the graph of

(i) Transpiration **(3marks)**

(ii) Absorption **(3marks)**

(d) What would happen to transpiration and absorption of water if the experiment was continued till 0050 hours. **(2 marks)**

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

(f) Explain how the factors you named in (e) above affect transpiration. **(2marks)**

7. Describe the

(i) Process of inhalation in mammals **(10 marks)**

(ii) Mechanism of opening and closing of stomata **(10 marks)**

8. How is the human eye adapted to its functions **(20 marks)**

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BIOLOGY MOCKS

SERIES 1 TRIAL 4 PAPER 1

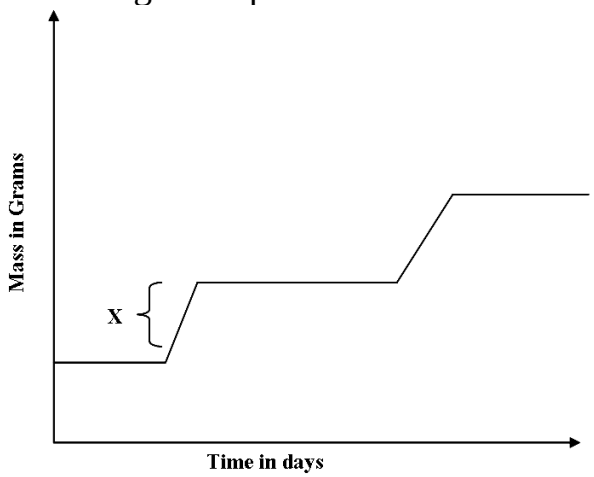
Kenya Certificate of Secondary Exams

TIME:2HRS 30 MINS

Answer all questions

SECTION A (40 MARKS)

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



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

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

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

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

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

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

$$C_6H_{12}O_6 + C_6H_{12}O_6 \xrightleftharpoons[\text{R}]{\text{X}} C_{12}H_{22}O_{11} + H_2O$$

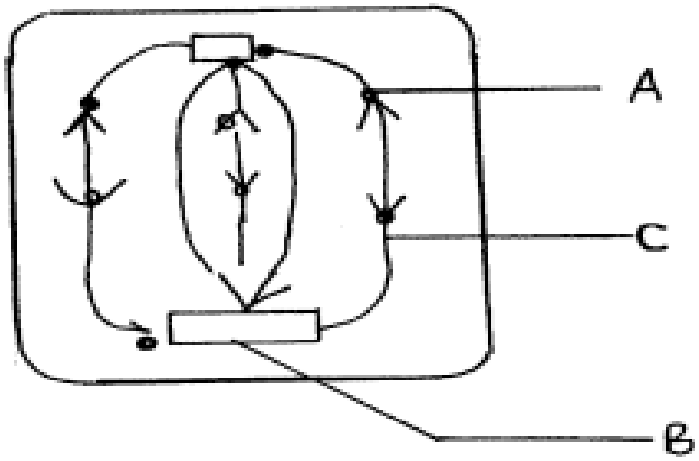
Glucose + Fructose ⇌ Sucrose + Water

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

Process X **(1 mark)**

Enzyme **R** **(1 mark)**

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



(a) Name the stage of mitosis it represents **(1 mark)**

(b) Name the structure

A- **(1 mark)**

C- **(1 mark)**

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

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

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

5. (a) What is the importance of the counter current flow in the exchange of gases in a fish**?** **(2 marks)**

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

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

K + Phosphate ⟶ Adnenosine triphosphate

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

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

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

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

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

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

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

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

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

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

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

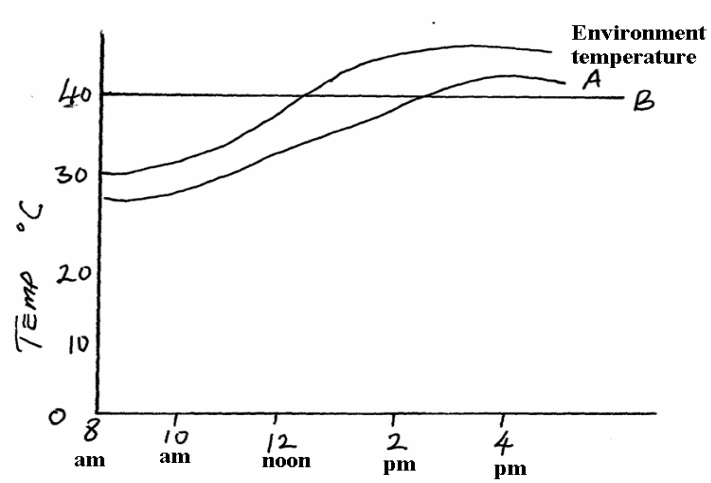
(b) What is the significance of high tail power in fish? **(1 mark)**

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

Endocrine system	Nervous system

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

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



(a) Which of the animals is;

(i) Endothermic **(1 mark)**

(ii) Ectothermic **(1 mark)**

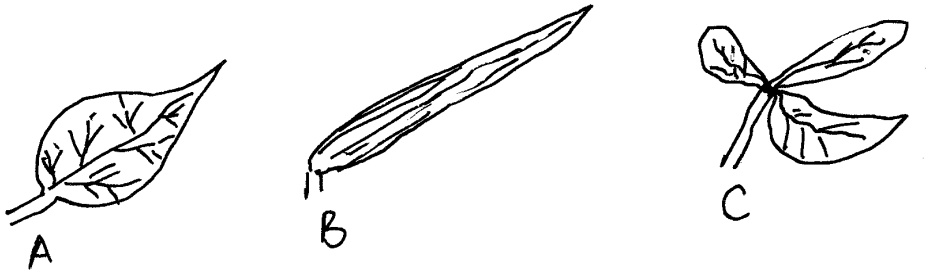
(b) With a reason, state which of the animals is likely to be widely distributed. **(2 marks)**

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

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

18. Below are diagrams of three leaves A, B and C. Construct a two step dichotomous

key which can be used to identify each of them. **(4 marks)**



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

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

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

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

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

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

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

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

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

(i) Species

(ii) Binomial nomenclature

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

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

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BIOLOGY MOCKS

SERIES 1 TRIAL 4 PAPER 2

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TIME:2HRS 30 MINS

Answer all questions

SECTION A (40 MARKS)

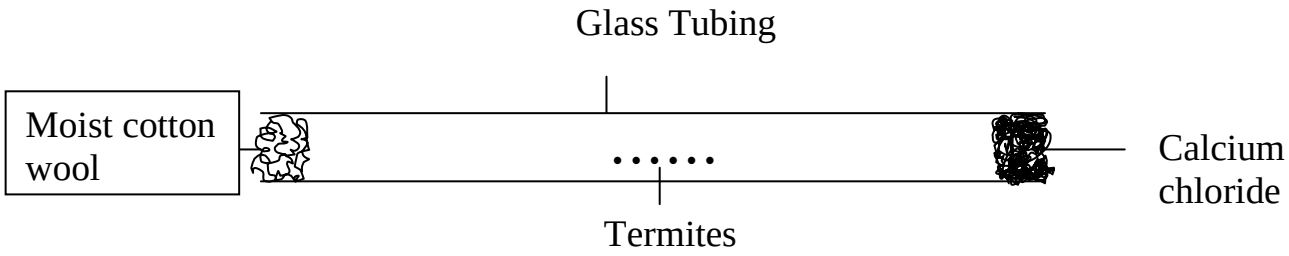
Answer all questions in this section in the spaces provided.

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

(b) (i) Name the type of response exhibited by the climbing stem. **(1mk)**

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

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



a. What observations are made after 20 minutes? **(1mk)**

b. What type of response is exhibited by the termites? **(1mk)**

c. What is the survival value of the above response? **(1mk)**

d. What is Photonasty? **(1mk)**

2. (a) What is multiple allelism? **(1mk)**

(b) A pure breeding black male mouse was mated with a pure breeding brown female mouse. All the offspring had black coat colour.

i. Explain the appearance of black coat colour in the offspring. **(1mk)**

ii. If the black parental mouse was mated with a mouse that is heterozygous for coat colour, work out the genotypic ratio of offspring. Show your working. (4mks)

iii. State **two** disorders in human beings hat are as a result of chromosomal mutation. **(2mks)**

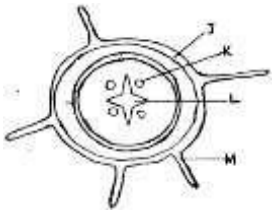
3. (a) (i) What is meant by the term biological control? **(1mk)**

(ii) Give an example of biological control. **(1mk)**

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

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

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

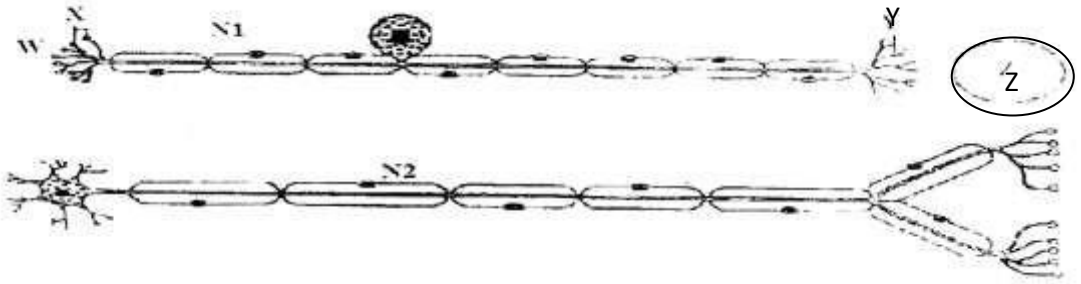


(b) From which plant organ was the section obtained? **(1mk)**

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

(d) Name the parts labeled J, K and L. **(3mks)**

5. The diagram below illustrate two types of neurons and associated structures. Study the diagrams carefully and answer the questions that follow.



(a) (i) Identify the type of neurons illustrated in diagrams **N1** and **N2.** **(2mks)**

(ii) Provide **two** reasons for your identity of the neuron in diagram N1. **(2mks)**

(c) Name each of the structures labeled X and Y in diagram N1. **(2mks)**

(d) Give the general name of the type of cell position Z in diagram N1. **(1mk)**

(e) Give the general name of the substance in position W in diagram N1. **(1mk)**

SECTION B

Answer question 6 (Compulsory) and any other one question from this section.

6. An investigation was conducted to compare rate of water loss from twigs of two different species of plants Q and L. The twigs had equal leaf surfaces. The results of the investigation were recorded in the table below.

Time of the day	6a.m	8a.m	10am	1p.m	12pm	1pm	2pm	3pm	6pm	8pm	12am
Water loss gh species Q	0	4	20	40	55	36	26	20	2	0	0
Water loss gh species L	8	20	39	131	198	182	130	81	45	12	12

(a) On the graph paper provided, plot a graph of Water loss gh^{-h} against time for the two plants. **(7mks)**

(i) At what time of the day was 60gh-1 of water lost by plant species L? **(1mk)**

(b) Name the apparatus which might have been used to investigate the rate of water loss. **(1mk)**

(c) State **<u>two</u>** precautions that were taken in setting up the experiment. **(2mks)**

(d) Which of the plant species is likely to be adapted to arid conditions? Give a reason. **(2mks)**

(e) Suggest how the stomata of species **Q** are structurally adapted to water loss. **(2mks)**

7. Describe how the mammalian male reproductive system is adapted to perform its functions. **(20mks)**

8. Describe the structure and functions of various organelles in a mature animal cell. **(20mks)**

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BIOLOGY MOCKS

SERIES 1 TRIAL 5 PAPER 1

Kenya Certificate of Secondary Exams

TIME:2HRS 30 MINS

Answer all questions

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

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

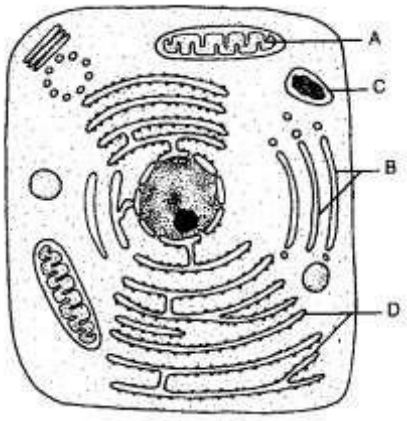
a) Pooter. **(1mark)**

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

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

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

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



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

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

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

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

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

ii) Condenser **(1mark)**

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

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

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

a) Decomposers

b) Predation

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

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

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

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

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

i. Population

ii. Community

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

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

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

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

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

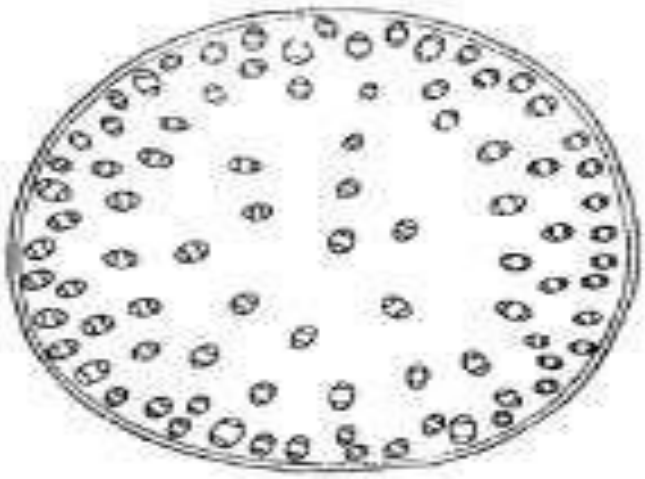
(i) Deletion. **(1mark)**

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

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

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

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



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

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

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

Pea plant-

Reason-

Bat-

Reason -

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

Typhoid -

Amoebic dysentery -

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

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

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

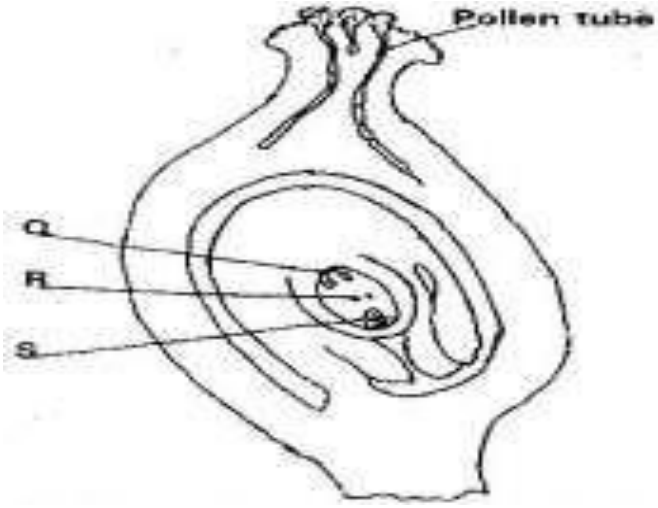
19. The diagram below represents a member of the kingdom Animalia.



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

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

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

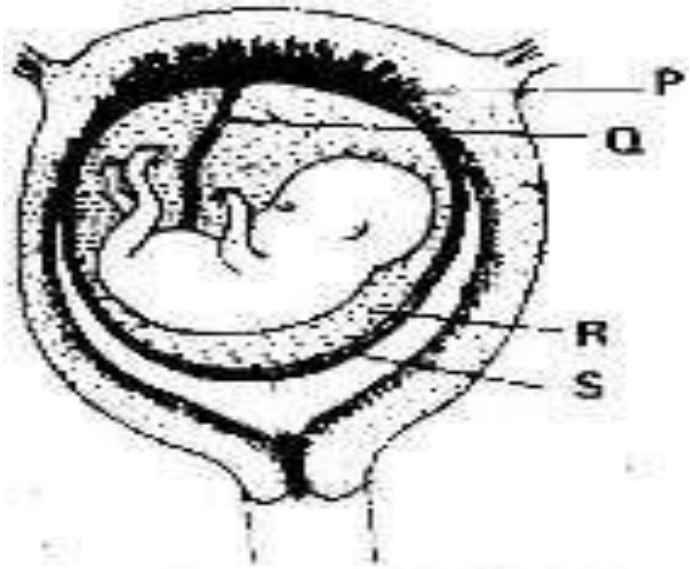


a) Name the parts labeled **Q** and **R.** **(2marks)**

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

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

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



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

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

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

a) Cockroach

b) Bird

c) Earthworm

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

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

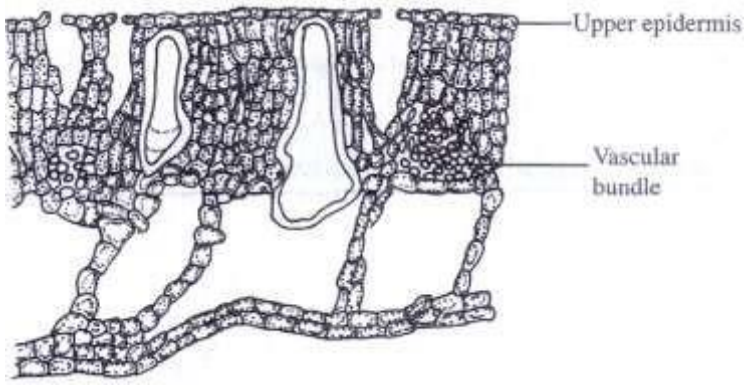
24. Name:-

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

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

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

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



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

b) Give t**wo** reasons for your answer in **(a)** above. **(2marks)**

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

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

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

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

BIOLOGY MOCKS

SERIES 1 TRIAL 5 PAPER 2

Kenya Certificate of Secondary Exams

TIME:2HRS

Answer all questions

SECTION A (40 MARKS)

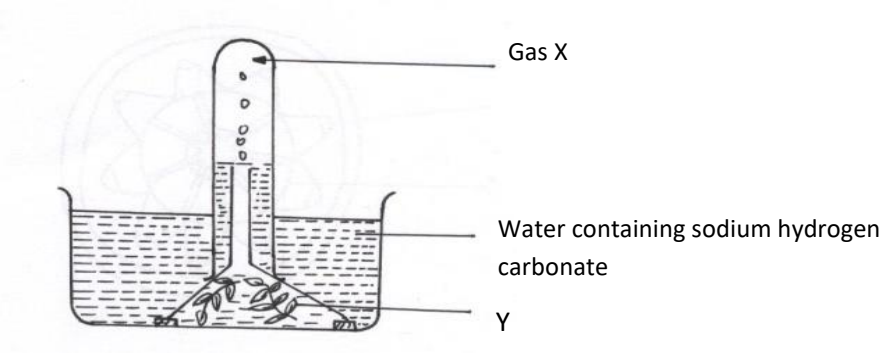
1. A cross between a red flowered plants and white flowered plants produced plants with pink flowers. Using letter R to represent the gene for red color and W for white.

a) What were the parental genotypes? **(2mks)**

b) Work out the cross between f1 generations **(4mks)**

c) State the phenotypic and genotypic ratios of the f2 generations **(2mks)**

2. The set up shown was used to investigate a certain process. The set up was left in bright sunlight for 4 hours.



a) State the aim of experiment **(1mk)**

b) Name **X** and **Y** **(2mks)**

c) Other than sunlight name three factors that would affect the experiment **(3mks)**

d) State how the identity of gas **X** could be confirmed **(1mk)**

e) Explain why submerged water plants was used in the experiment **(1mk)**

3. (a) What is meant by:

i) Autecology **(1mk)**

ii) Synecology **(1mk)**

(b) Using the table below, answer the questions that follow

	Number of stomata	
Leaf	**Upper epidermis**	**Lower epidermis**
A	300	0
B	150	200
C	02	13

Suggest the possible habitat of the plants from the leaves were obtained **(3mks)**

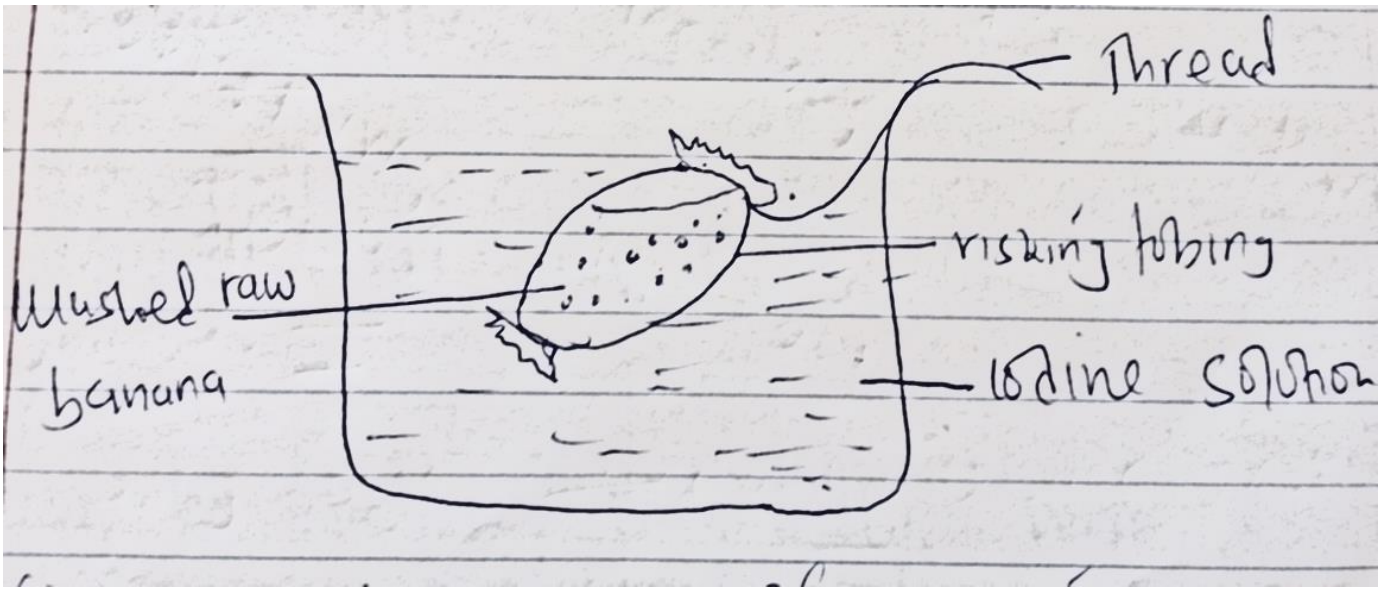
A

B

C

(c) State the modifications in the stomata of leaf C **(3mks)**

4. In an investigation, a raw banana was peeled, mashed into a paste and treated as shown in the set up below.



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

b) State the expected observations in the above set up after 30 minutes **(2mks)**

c) Account for the observations made in (b) above. **(2mks)**

d) State three role of active transport in human **(3mks)**

5.

substance	% in blood Plasma	% in glomerular Filtrate	% in urine
Water	100	90	60
Protein	6.5	0	0
Urea	0.03	0.03	1.8
glucose	0.1	0.1	0

a) Why is the concentration of protein in glomerular filtrate and urine zero? **(1mk)**

b) **(i)By** how many times is urea more concentrated in urine than in glomerular Filtrate? **(1mk)**

(ii) Explain why there is greater concentration of urea in urine than glomerular filtrate **(1mk)**

c) Explain why there is no glucose in urine **(1mk)**

d) State the economic importance of the following plant excretory products

i) Rubber **(1mk)**

ii) Papain **(1mk)**

e) State two reasons why plants lack complex excretory organs. **(2mks)**

SECTION B: (40MARKS)

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

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

Time after planting (days)	Dry weight of endosperm (mg)	Weight of embryo (mg)	Total dry weight (mg)
0	43	2	45
2	40	2	42
4	33	7	40
6	20	16	37
8	10	25	35
10	6	33	39

(a) On the same axes, plot a graph of dry weight of endosperm, weight of the embryo and the total dry weight against time. **(8mks)**

(Provide a graph paper)

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

(c) Account for the;

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

ii) Increase in weight of the embryo from day 0 to 10 **(2mks)**

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

iv) Increase in the total dry weight after day 8 **(1mk)**

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

Inside seed **(2mks)**

Outside seed **(2mks)**

(e) Give one characteristic of meristematic cells **(1mks)**

7. (a) Describe the process of fertilization in flowering plants **(15mks)**

(b) State five adaptive features of red blood cells to their function **(5mks)**

8. (a) Explain inspiration in the gills of bony fish **(10mks)**

(b) Explain the factors affecting the rate of breathing in humans **(10mks)**

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

BIOLOGY MOCKS

SERIES 1 TRIAL 6 PAPER 1

Kenya Certificate of Secondary Exams

TIME:2HRS

Answer all questions

1. **(a)** Define the term _parthenocarpy‘. **(1mk)**

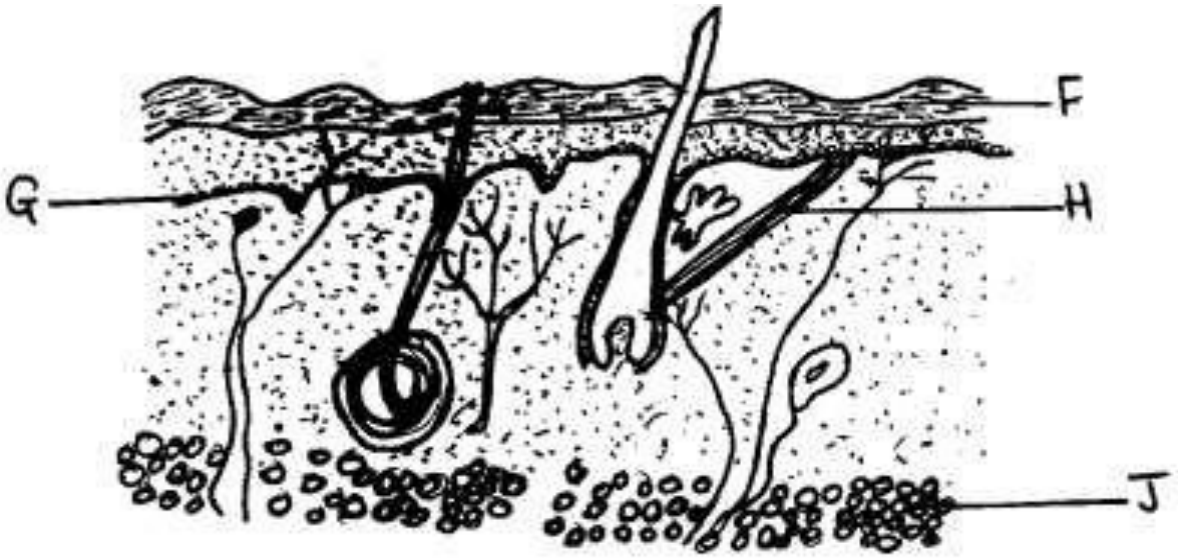
(b) Name **two** plant growth hormones that promote parthenocarpy. **(2mks)**

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 shows a longitudinal section of mammalian skin.



a) Name the parts labelled **F** and **G.** **(2mrks)**

b) State **one** function of each of the parts labelled **H** and **J** **(2mrks)**

4. Other than carbon (IV) oxide, name other products of anaerobic respiration in plants **(2mks)**

5. **(a)** Name the fluid that is produced by sebaceous glands. **(1mk)**

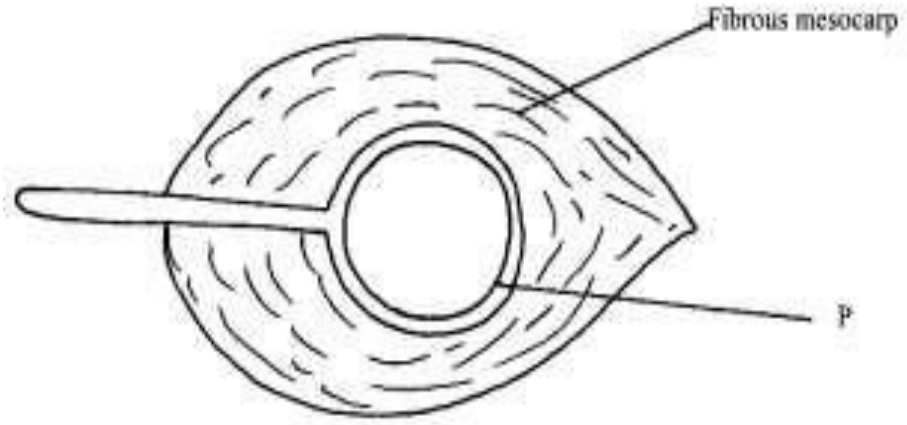
(b) State **two** functions of sweat on the human body. **(2mks)**

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. The diagram below represents a longitudinal section of a fruit



(a) Name structures labeled P **(1mk)**

(b) Describe two adaptations of the fruit for its mode of dispersal **(3mks)**

(i) Mode of dispersal

(ii) Adaptation

9. (a) What causes the following diseases?

(i) Diabetes mellitus. **(1mk)**

(ii) Diabetes insipidus. **(1mk)**

(b) An individual shows the symptoms for diabetes mellitus, how would you determine in the school laboratory whether they are positive for the condition? (3mks)

10. In an attempt to estimate the number of weaver birds in a small woodland 435 were captured, marked and released. Three days later, 620 were captured 75 of which were marked.

a) What is the name of the sampling method described above? **(1mk)**

b) Calculate the approximate size of the weaver bird population in the woodland. **(2mks)**

c) Give one disadvantage of this method. **(1mk)**

11. Identify the nucleic acid whose base sequence is shown below.

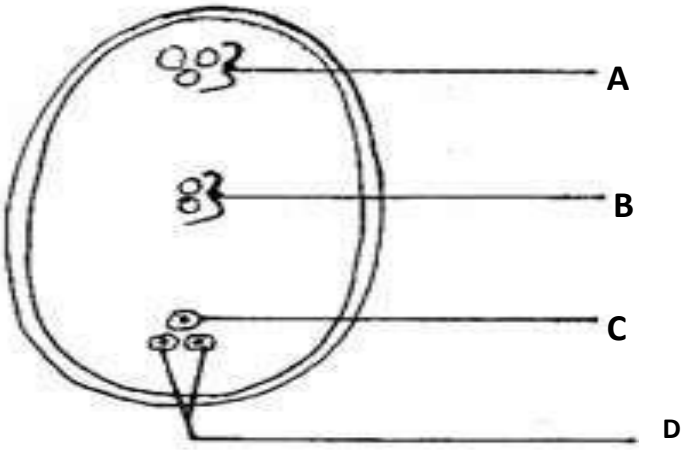
G-A-C-U-A-G-A-C-G

i) Identify the type of nucleic shown above **(1mk)**

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

iii) Write the base sequence of a DNA strand for the nucleic acid shown above **(1mk)**

12. The diagram **below** shows a mature embryo sac of a flowering plant.



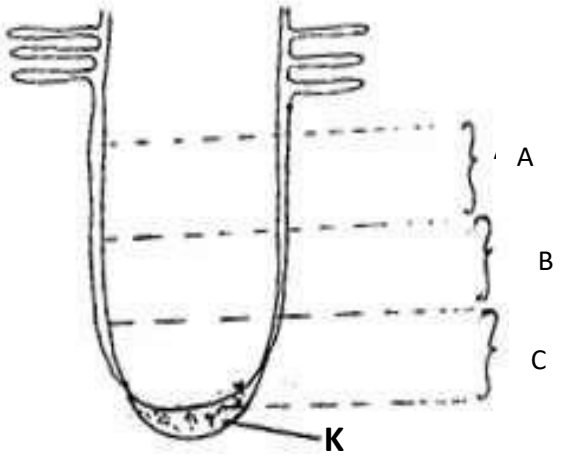
(a) Name the parts labeled **A** and **B** **(2mks)**

(b) What is the function of the structure labeled B? **(1mk)**

13. (a) Name the tissues that transport water in plants. **(1mk)**

(b) State why the tissue above is said to be dead. **(1mk)**

14. The diagram **below** shows regions of growth in a root. Study it and answer the questions that follow.



(a) Name the zone labeled **B** **(1mk)**

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

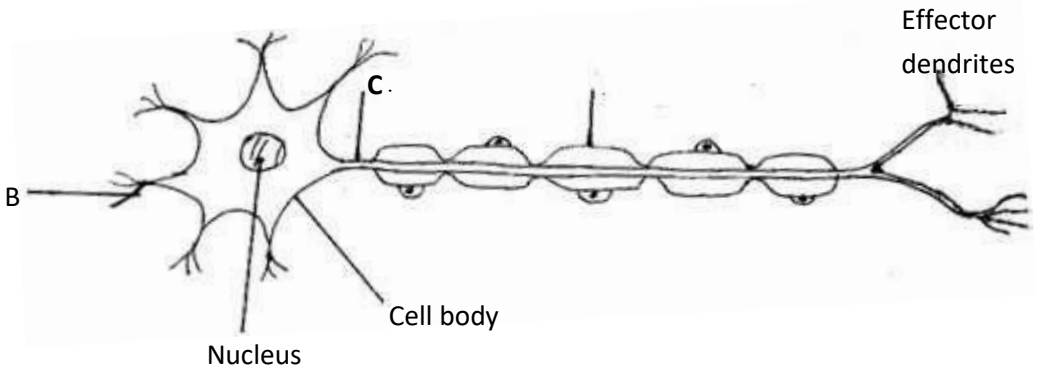
(c) State three characteristics of the cells found in zone **C** **(3 mks)**

15. The enzymes pepsin and trypsin are secreted in their inactive forms. Explain why they are secreted in these inactive forms. **(1mk)**

16. (a) Give two examples of natural selection in action. **(2mk)**

(b) List three features that make man the most dominant species on earth. **(3mks)**

17. Study the diagram **below** of a neurone in human being.



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

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

(c) Using an arrow indicate the direction of movement of a nerve impulse along the neuron **(1mark)**

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)**

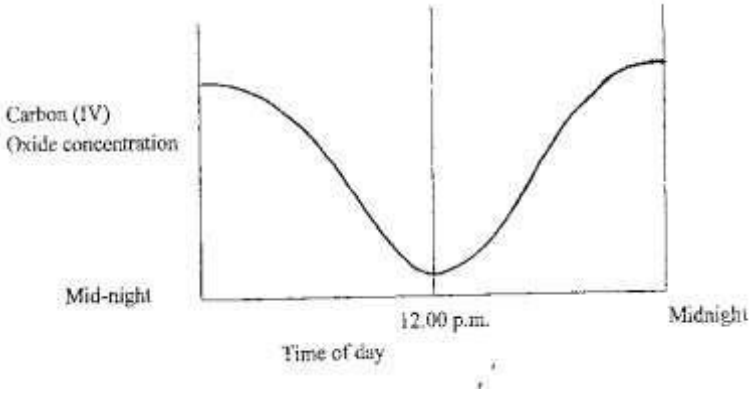
(c) State **one** adaptation of the tooth to its function. **(1mk)**

19.a) Name the part of the brain that regulates breathing **(1mk)**

b) Give two ways through which the body responds to increased concentration of carbon (IV) oxide in the blood **(2mks)**

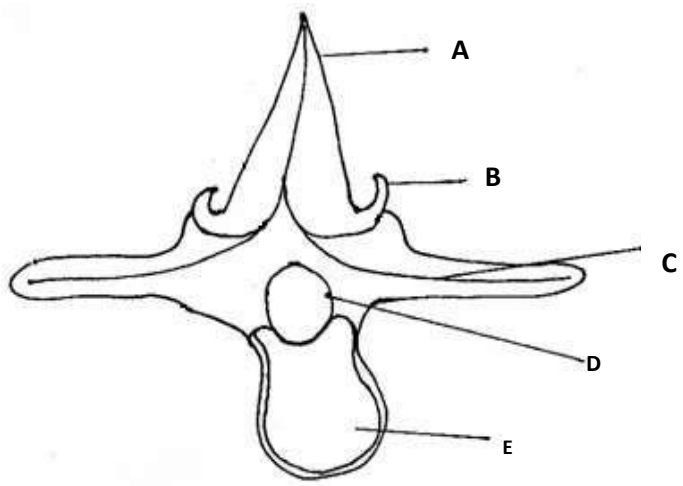
c) Name the structures in pneumatophores through which gaseous exchange occurs. **(1mk)**

20. The concentration of carbon (IV) oxide in a tropical forest was measured during the course of 24 hours period from mid-night to mid-night.



Account for the results obtained at mid day. **(2mks)**

21. The diagram **below** represents the anterior view of a certain vertebra.



(a) With a reason, identify the type of vertebra shown **above**. **(2mks)**

(b) Name the parts labeled.

(i) A **(1mk)**

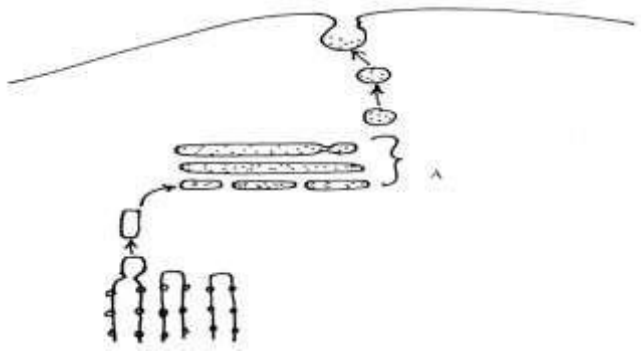
(ii) D **(1mk)**

(c) State the function of part **E**. **(1mk)**

22.(a) State one similarity between diffusion and osmosis **(1mk)**

(b) State two factors that can reduce the rate of active transport **(2mks)**

23. Study the diagram below and use it to answer the questions.



(a) Identify the organelle marked A. **(1mk)**

(b) Give three functions of the organelle named in (a) above **(3mks)**

24. It was found that during germination of pea seeds 9.3cm^3 of carbon (iv) oxide was produced while 9.1cm^3 of oxygen was used up.

(a) Calculate the respiratory quotient (RQ) of the reaction taking place**.** **(2mks)**

(b) Identify the type of food substance being metabolized. **(1mk)**

25. What is the biological importance of the larval stage during metamorphosis **(2mks)**

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

BIOLOGY MOCKS

SERIES 1 TRIAL 6 PAPER 2

Kenya Certificate of Secondary Exams

TIME:2HRS

Answer all questions

1. In human beings, a **downward pointed frontal hairline** (—windows peak‖) is a heritable trait. A person with windows peak always has at least one parent who has this trait; where as persons with **frontal hairline** may occur in families in which one or even both parents have windows peak. Using **W** and **w** to symbolize genes for this trait

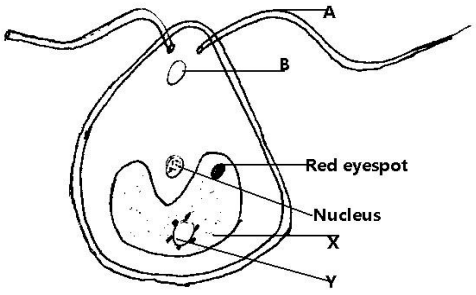
(a) Determine the F1 generation if a homozygous windows peak male parent is married to a homozygous frontal hairlined female parent **(4mks)**

(b) State two causes of variations **(1mk)**

(c) Name two sex linked genetic disorders affecting human females and males **(2mks)**

(d) What is genome

2. The diagram below shows an organism obtained from an aquatic ecosystem



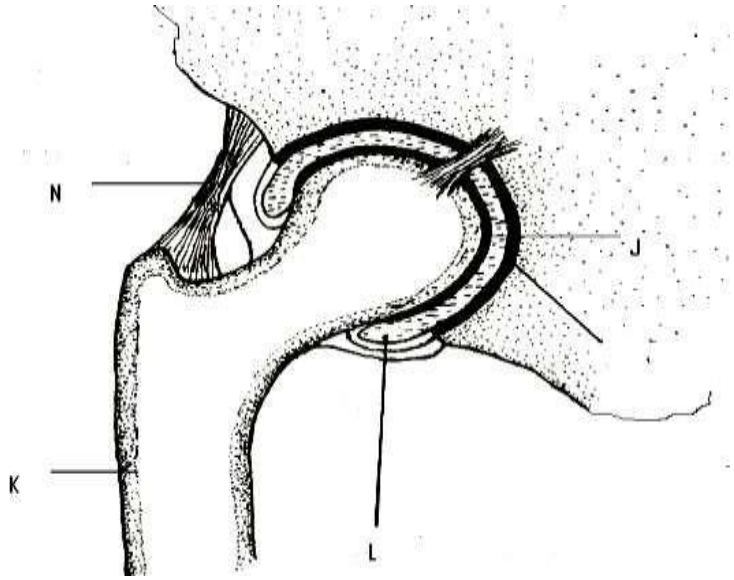
(a) **State** the kingdom in which the organism belongs. **(1mk)**

(b) **Name** the parts labeled B and Y **(1mk)**

(c) **State** the functions of the following parts A , X and Z **(3 mk)**

(d) Explain briefly why the organism is described as eukaryotic **(2mk)**

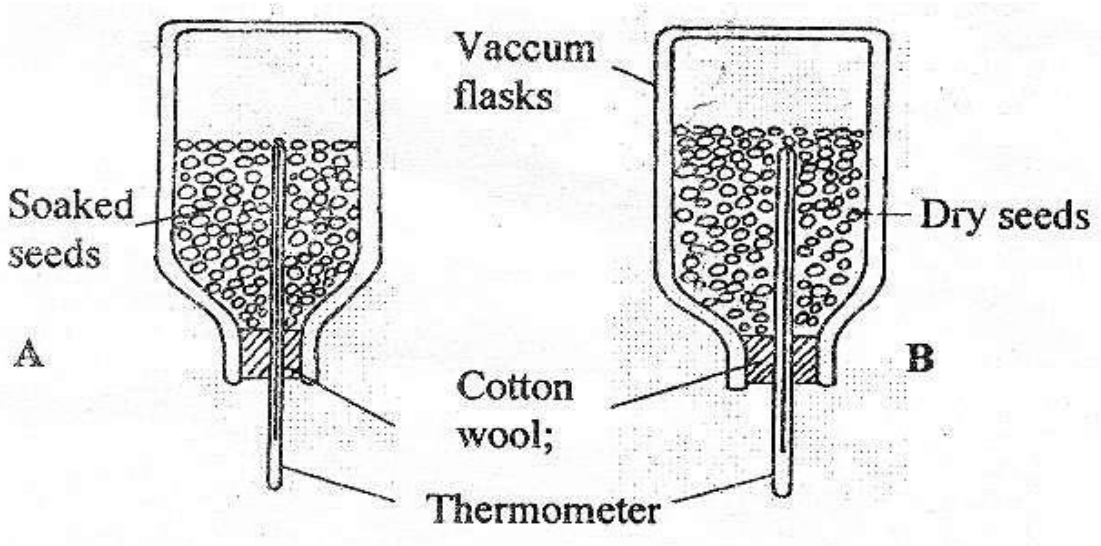
3. a) The diagram below shows some of the features of a synovial joint. Study the diagram carefully and answer the questions that follow.



(a) Name the type of synovial joint. **(1 mark)**
(b) Name the parts labeled J, and L **(2 marks)**
(c) State **two** roles of the part labeled L. **(2 marks)**
(d) Suggest **one** advantage of this type of joint. **(1 mark)**
(b) State how the following tissues are adapted to provide mechanical support in plants **(2mks)**

i) Parenchyma
ii) Collenchyma

4. A student set up an experiment using soaked and dry seeds as shown below



a) State the objective of this experiment **(1mk)**

b) State the observations made in each of the flask after 24 hours **(2mks)**

c) Account for the observation made in (b) above **(2mks)**

d) Suggest why vacuum flasks were used in this experiment **(1mk)**

e) What alteration would you make in the set-up to make the results more reliable **(1mk)**

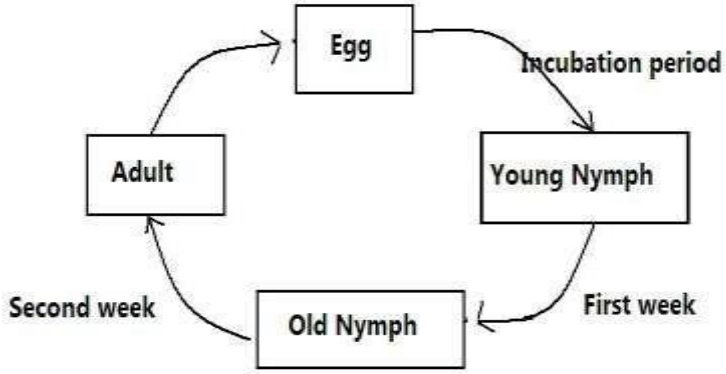
f) Why should the seeds be washed with antiseptic/10% formalin? **(1mk)**

5 a) Explain how the following meristematic tissues contribute to growth of higher plants

i) Vascular cambium **(2mks)**

ii) Cork Cambium **(2mks)**

b) The diagram below shows a life cycle of a cockroach



a) Name the hormone that would be at high concentration during.

(i) First week **(1mk)**

(ii) Second week **(1mk)**

b) Name the structure that produces hormone in a (ii) above **(1mk)**

c) Name the series of stages through which the nymph undergoes to reach adult stage (1mks)

SECTION B (40 Marks)

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

6. The menstrual cycle is a sequence of events repeated monthly in the female production system. The table below shows the concentration of oestrogen and progesterone hormones and body temperatures of female against time.

Time in days	Oestrogen mg/100cm of blood	Progesterone mg/100cm^3 of blood	Temperature in 0^oc
1	20	0	36.4
2	20.5	0	36.6
3	25	0	36.7
4	27.5	0	36.8
5	30	0	36.7
6	32.5	0	36.6
7	35	0	36.8
8	40	0	36.7
9	48	0	36.6
10	56	0	36.8
11	64	0	36.7
12	72	0	36.6
13	80	0	36.4
14	170	20	36.3
15	140	50	36.6
16	80	80	37.0
17	70	130	37.2
18	65	170	37.0
19	60	160	37.1
20	65	150	37.15
21	130	130	37.2
22	140	110	37.1
23	130	90	37.0
24	100	70	37.1
25	80	50	37.2
26	60	20	37.0

27	20	0	36.4

a) Using the same axis draw graphs of oestrogen and progesterone against time/days **(8marks)**

b) State the possible event taking place in the uterus during the first week? **(1 mark)**

c) State the events taking place in the ovary between day 1 and day 13**.** **(2 marks)**

d) Account for the sudden increase in the progesterone concentration between day 14 and day18. **(2 marks)**

e) Account for the change in temperature between day 14 and 17. **(1 mark)**

f) Account for the change of the curve of progesterone between day 19 and 27. **(2marks)**

g) State the function of the following.

(i) Ovary (**1mark)**

(ii) Progesterone **(1 mark)**

(iii) Oestrogen **(1 mark)**

7 a) Describe how the following evidences support the theory of organic evolution: geographical distribution, fossil records and comparative anatomy **(10mks)**

b) Explain tropic responses in plants and their survival values **(10mks)**

8 a) Describe the structural adaptations of mammalian heart to its Functions **(10mks)**

b) Explain the role of osmosis in organisms (**10mks)**

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

BIOLOGY MOCKS

SERIES 1 TRIAL 7 PAPER 1

Kenya Certificate of Secondary Exams

TIME:2HRS

Answer all questions

1. Give the name to the study of:

(a) The cell **(1mark)**

(b) Micro-organism **(1mark)**

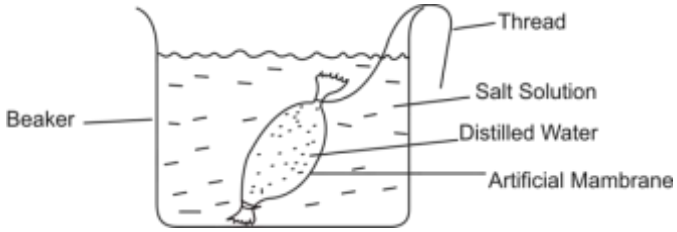
2. State one function of each of the following cell organelles **(2marks)**

(i) Lysosomes

(ii) Ribosomes

3. A student drew a 3cm long diagram of a plant flower. If the actual length of the flower was 6cm, calculate the magnification of drawing made by the student. Show your working. **(2marks)**

4. An experiment was set up as shown below



The set up was left for 30 mins.

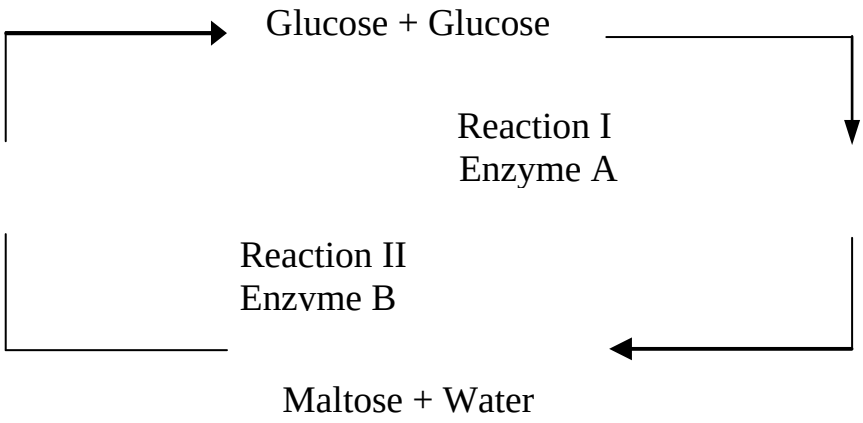
(a) What was the aim of the experiment **(1mk)**

(b) State and explain what would be observed after 30 minutes. **(3mks)**

5. (i) Explain why insectivorous plants trap and digest insect **(2mks)**

(ii) Name the type of response in 5(i) above **(1mk)**

6. The diagram below shows chemical reactions I and II which are controlled by enzymes.



(i) Into which class of carbohydrates is maltose **(1mk)**

(ii) Name reaction I and enzyme **A** **(2mks)**

Reaction I

Enzyme A

7. (i) Identify the mode of feeding of the animal whose dental formula is shown below **(1mk)**

$$I\ \frac{O}{3}\quad C\ \frac{O}{O}\quad PM\ \frac{3}{3}\quad M\ \frac{3}{3}$$

(ii) Give reasons for your answer in 7(i) above **(2mks)**

8. Explain each of the following:

(a) A mature plant cell does not lose its shape even after losing water **(1mk)**

(b) Xylem vessels do not collapse even when they are not conducting water **(1mk)**

9. Burning charcoal stove in a poorly ventilated room is likely to cause death of the inhabitants. Explain. **(3mks)**

10. Name two structures for gaseous exchange in aquatic plants **(2mks)**

11. Why should respiratory surfaces be:

(i) Moist **(1mk)**

(ii) Highly vascularised **(1mk)**

12. A process that occurs in plants is represented by the equation below.

$C_6H_{12}O_6 \longrightarrow 2C_2H_5Oh + 2CO_2 + Energy$

(Glucose) (Ethanol) (Carbon VI oxide)

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

(b) State the economic importance of the process named in (a) above **(2mks)**

13. Give two reasons why animals have specialized organs for excretion as compared to plants. **(2mks)**

14. Explain why the body temperature of a healthy human being must rise up to 39^0C on a humid day. **(2mks)**

15. A student in form 3 caught an organism which had the following characteristics.

(i) Body divided into two parts

(ii) Simple eyes

(iii) Eight legs

Classify the organism up to the class level **(3mks)**

16. State the importance of decomposers in an ecosystem **(2mks)**

17. State the role of the following hormones

(a) Prolactin **(1mk)**

(b) Oxytocin **(2mks)**

18.(i) How do the following mechanisms hinder self-pollination

(a) Protandry **(1mk)**

(b) Protogyny

(ii) Which plant growth hormone induces parthenocapy **(1mk)**

19. (i) State two importances of metamorphosis to the life of insects **(2mks)**

(ii) Name the hormone that is responsible for apical dominance **(1mk)**

20. (i) Name an importance of non-dissuction in agriculture **(1mk)**

(ii) State two disorders caused by gene mutation **(2mks)**

21. (i) Give a reason why it is only mutation in genes of gametes that can influence mutation **(1mk)**

(ii) Differentiate between convergent and divergent evolution **(2mks)**

22. (i) State the importance of thigmotropism **(2mks)**

(ii) Chloroplasts in a palisade cell move away from extreme light intensity. Name the type of response by the chloroplast **(1mk)**

23. (i) State the components of peripheral nervous system **(2mks)**

(ii) Give a reason for the presence of white matter in the central nervous system **(1mk)**

24. Name the type of joint founel between:

(a) Humerous and ulna **(1mk)**

(b) Femur and Pelvic Girdle **(1mk)**

25. Give the importance of support in plants **(3mks)**

26. Name the two hormones that prepares a person for emergency **(2mks)**

27.(i) Explain why trypsin is secreted in inactive form **(1mk)**

(ii) State the inactive form of the above mentioned enzyme in **27 (i)** **(1mk)**

28.(i) State why green plants are termed as primary producers **(1mk)**

(ii) State one adaptation of aquatic plants to photosynthesis **(1mk)**

29. State three ways in which support is brought about in a leaf of a terrestrial plant **(3mks)**

30. Briefly explain how double fertilization occurs in the embryo sac of a flowering plant **(3mks)**

31. State the hameostatic functions of the following hormone.

(i) insulin **(1mk)**

(ii) Glucagon **(1mk)**

NAME……ADM NO……

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BIOLOGY MOCKS

SERIES 1 TRIAL 7 PAPER 2

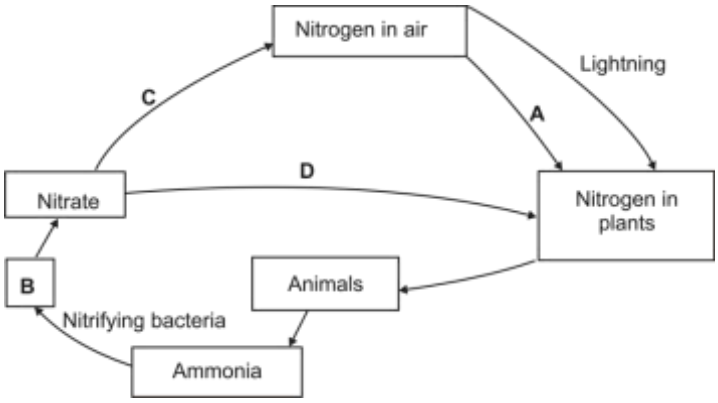
Kenya Certificate of Secondary Exams

TIME:2HRS

SECTION A (40MARKS)

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

1. Below is a diagram of nitrogen cycle. Study it and answer the questions that follows.



(a) Name the processes represented by: A and B **(2marks)**

(b) Name the compound represented by B **(1mk)**

(c) Name the group of organisms represented by C **(1mk)**

(d) (i) Identify the class of the plants to which the above cycle takes place **(1mk)**

(ii) Name the part of the plant where process A takes place **(1mk)**

(e) How would use of excessive pesticides affect process A **(2mks)**

2. A pure breeding black guinea pig was crossed with a pure breeding white guinea pig, the offspring had a coat with black and white patches

(a) **(i)** Draw a genetic across to show the F2 of this cross (use letter G to represent gene for black coat and H for white colour) **(4mks)**

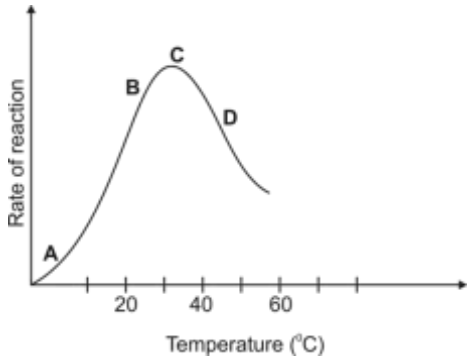
(ii) From the cross, work out the genotypic ratio of F2 **(1mk)**

(b) State the phenotypic ratio of the F2 above **(1mk)**

(c) (i) Name the genetic expression of the colour observed in F1 **(1mk)**

(ii) Give an example of a trait in man where the condition named in c(i) above is expressed **(1mk)**

3. The graph below show the rate of an enzyme controlled reaction against temperature (OC)



Explain the shape of the curve:

(i) Between A and B **(2mks)**

(ii) At Point C **(2mks)**

(iii) Between C and D **(2mks)**

(iv) Other than temperature, state two factors that affect the above reaction **(2mks)**

4. (a) Explain the fate of excess amino acids in the liver **(4mks)**

(b) Name the parts of the human nephron that are only found in the cortex **(2mks)**

(c) What would happen if a person secreted less antidiuretic hormone into the blood circulation **(2mks)**

5. The question below represents a chemical equation that takes place in green plants under certain conditions

Carbon (IV) Oxide + water ⟶ Glucose +X

(a) Name substance X **(1mk)**

(b) Other than the conditions stated in the equation, state two other conditions necessary for the reaction **(2mks)**

(c) Name two types of cells in which this process occurs **(2mks)**

(d) Name the process represented by the equation given above **(1mk)**

(e) State the importance of the process named in 5(d) above **(2mks)**

SECTION B (40 MARKS)

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

6. A certain experiment was performed to demonstrate the effect of sweating on human body temperature. Boiling tubes A and
B were filled each with water their initial temperatures recorded. This was repeated after every 5 minutes. The surface of Tube A was continuously wiped with a piece of cotton wool which had been soaked in methylated spirit. The results are as shown below.

Time (Min)	**Temperature O^C in tubes**	
	A	B
0	80	80
5	54	67
10	40	59
15	29	52
20	21	47
25	18	46

(a) On the same axis, plot graphs of water temperature against time (min) **(8mks)**

(b) Find the rate of cooling in test tube A **(1mk)**

(c) Why was tube B included in the set up? **(1mk)**

(d) Name two ways through which heat is lost in tube B **(2mks)**

(e) State the expected results if tube A was insulated **(1mk)**

(f) Name the structures in the following organisms that would insulate heat loss

(i) Birds **(1mk)**

(ii) Mammals **(1mk)**

(g) Name any two receptor cells on the skin of man **(2mks)**

(h) Describe the response of hair on the skin during cold weather **(3mks)**

7. (a) What is meant by the term natural selection **(2mks)**

(b) Describe how natural selection results to speciation **(8mks)**

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

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

NAME……ADM NO……

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BIOLOGY MOCKS

SERIES 1 TRIAL 8 PAPER 1

Kenya Certificate of Secondary Exams

TIME:2HRS

SECTION A (40MARKS)

Answer ALL questions in this section in the spaces provide

1. A young scientist observed a bird laying her eggs in a nest and later the eggs hatched into chicks. Name three characteristics shown by the chicks that show a chick is a living thing but an egg is not **(3mks)**

2. Which organelles should be abundant in;

i) Skeletal muscle **(1mk)**

ii) Palisade tissue **(1mk)**

3. A form 1 student was preparing temporary slides in the laboratory, in the course of preparation he carried out the following processes;

i) Sectioning

ii) Fixation

iii) Staining

State the importance of the above processes **(3mks)**

4. Why are lysosomes many in phagocytic cells **(2mks)**

5. Differentiate between guttation and transpiration **(2mks)**

6. a) Give a reason why xylem vessel should be dead **(1mk)**

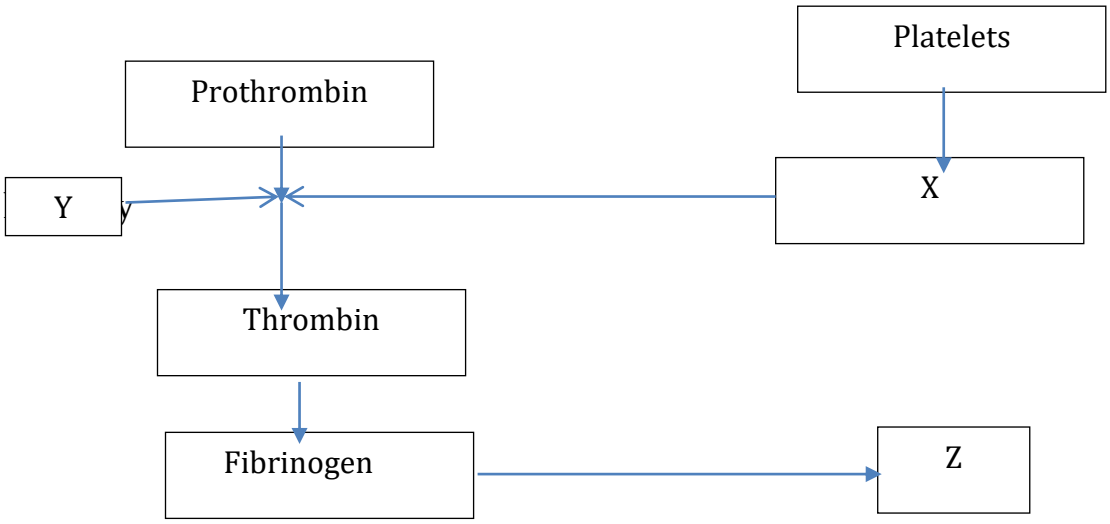
b)What is the role of lignin in the wall of the xylem vessel **(1mk)**

7. Name the disease of the blood characterized by,

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

b) Cresent –shaped haemoglobin **(1mk)**

8. The chart below is a summary of blood clotting mechanism in a man.

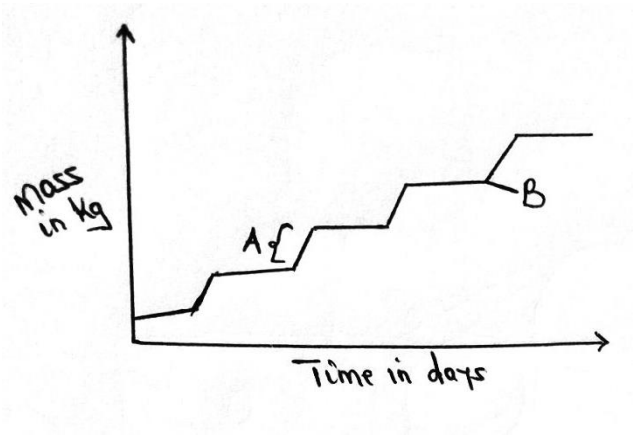


Name;

i) The metal ion represented by Y **(1mk)**

ii) The end product of the mechanism represented by Z **(1mk)**

9. The graph below represents the growth of animals in a certain phylum. Study it and answer the questions that follow.



a) Name the type of growth pattern shown on the graph **(1mk)**

b) Identify the process represented by letter B **(1mk)**

c) Name the hormone responsible for the process in (b) above **(1mk)**

10. Explain why a mule is infertile **(1mk)**

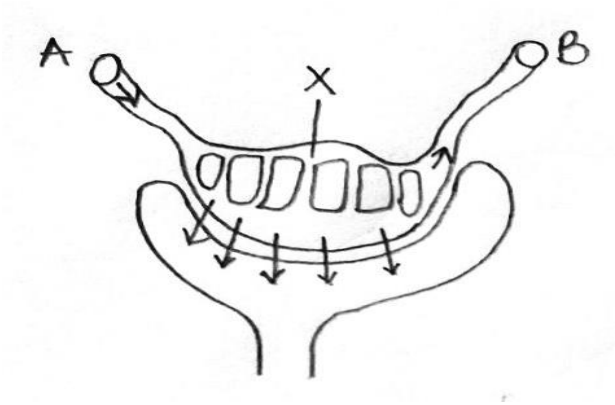
11. Phylum Arthropoda is the most successful of invertebrates. Explain two characteristics that make them most successful **(2mks)**

12. Name phylum whose members possess a notochord **(1mk)**

13.a) Define evolution and homologous structures **(2mks)**

b) State three limitations of using fossil records as an evidence that supports organic evolution **(3mks)**

14. The following is part of a kidney nephron



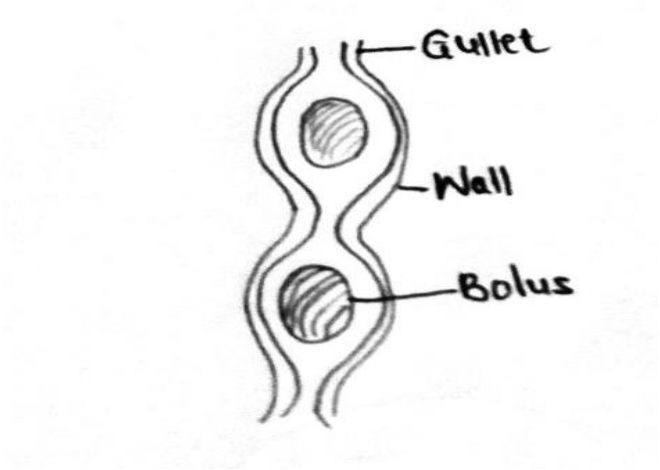
a) i) Name the process represented by the arrows **(1mk)**

ii) Name the conditions necessary for the process named in (a) (i) above to take place **(1mk)**

b) Identify with a reason vessel **A** **(1mk)**

c) Name any two blood components that are present in vessel (A) but are absent in vessel **B** **(2mks)**

15. The diagrammatic representation below illustrates one of the process that occurs in mammals during feeding. Carefully study it and answer the following questions



i) Identify the process **(1mk)**

ii) State two structural adaptations of gullet to its functions **(2mks)**

iii) Name one enzyme already present in the food bolus within the gullet in man **(1mk)**

b) State two functions of mucus secreted by the intestines **(2mks)**

16. Explain each of the following;

a) Variegated plants accumulates less food than non-variegated plants under similar conditions. **(2mks)**

b) Most leaves are thin with broad leaf surface **(2mks)**

17. State the economic importance of the following plant excretory products **(3mks)**

a) Papain
b) Caffein
c) Colchicine

18. a) State two processes which occurs during anaphase of mitosis **(2mks)**
b)What is the significance of first meiotic division **(1mk)**
c)State two ways in which HIV/AIDS is transmitted from mother to child **(2mks)**

19. State the function of the following during pregnancy **(3mks)**
a) Amnion
b) Amniotic fluid
c) Umblical cord

20. Name the process by which;
i) Producers convert sunlight energy into chemical energy **(1mk)**
ii) Chemical energy is converted into heat energy by consumers **(1mk)**

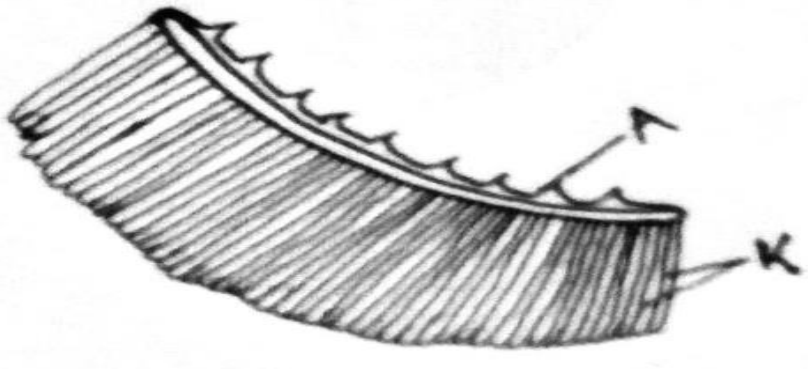
21. Students from Mpesa foundation academy wanted to investigate the population of crabs in their school pond. They caught 50 crabs, marked them with white paint on the cephalothorax and then released them back into the pond. After three days, they came back and caught 50 crabs of which 3 had the white mark.
a) Using the data above, calculate the population of crabs in the pond **(2mks)**
b) Suggest three assumptions the students made during this study **(3mks)**

22. State any two methods that can be used at home to properly manage domestic effluents **(2mks)**

23.a) Explain how the following factors increase the rate of diffusion **(3mks)**
i) Temperature
ii) Diffusion gradient
iii) Size of diffusing particles
b) Diffusion is a passive process while active transport is an active process. Explain **(2mks)**

24.a) Waterlogging in terrestrial plants inhibit uptake of certain mineral ions from the soil by the plants. Explain **(3mks)**
b) State two illustrations of Osmosis in plants **(2mks)**

25. The diagram below represents a gill of a fish



i) State two ways in which a large surface area is created in structures labelled K **(2mks)**

ii) Name the type of flow system that occurs between water and blood in the capillaries present on structures K **(1mk)**

iii) Name an organ in human beings that also display the flow system named in (ii) above **(1mk)**

26. Identical twins were separated after birth and were then raised in different environments. One in Kenya and the other in U.S.A. They rejoined after 18 years and they looked slightly different.

i) Name the type of variation the twins exhibited **(1mk)**

ii) Give two observable differences likely to be noted between the twins **(2mks)**

NAME……ADM NO……

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BIOLOGY MOCKS

SERIES 1 TRIAL 8 PAPER 2

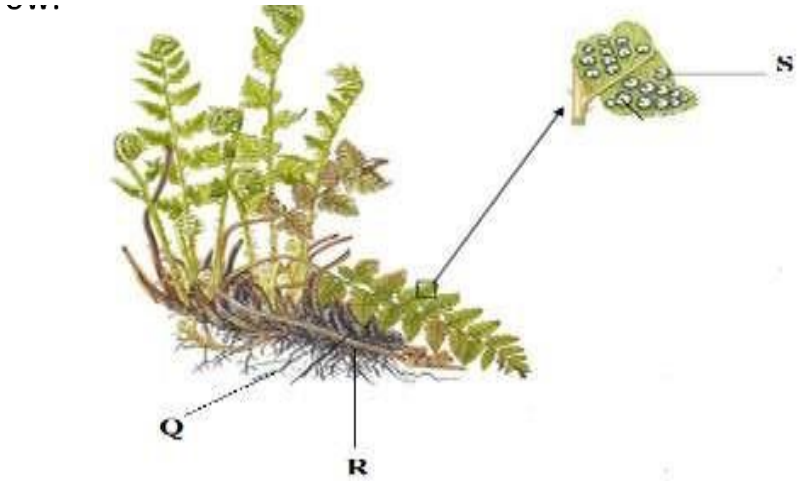
Kenya Certificate of Secondary Exams

TIME:2HRS

SECTION A (40MARKS)

Answer ALL questions in this section in the spaces provide

1.The diagram below indicates an organism that grows under shaded places with damp conditions. Study it and answer the questions that follows



(a) Name the division to which the specimen belongs. **(1 mark)**

(b) Name and state the functions of the parts labelled Q, R and S. **(6 marks)**

(c) Name the two body forms of the organism in its alternation of generation. **(2 marks)**

2. In cattle the gene for red colour is represented by letter R and that of white colour as W. A Red bull and a white cow were crossed and all the offspring were Roan.

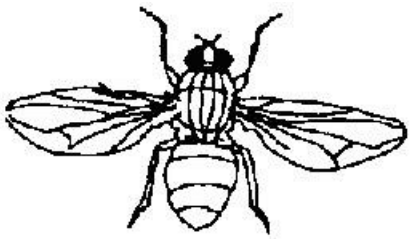
(a) Give a reason for the appearance of roan cattle in F1 generation. **(1 mark)**

(b) Using a punnet square work out the F2 generation. **(4 marks)**

(c) State the genotypic and phenotypic ratio of the F2 offspring above. **(2 marks)**

(d) Name the molecule that carries genetic information in eukaryotic cells. **(1 mark)**

3. Study the diagram of the organism shown below then answer the questions that follow.



(a) State the phylum to which the organism belongs. **(1mark)**

(b) With reasons state the class to which the organism belongs.

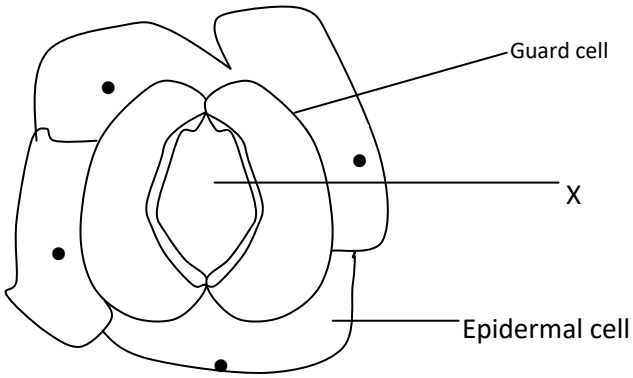
Class **(1 mark)**

Reasons **(3 marks)**

(c) Name **two** human diseases of which the organism is a vector. **(2 marks)**

(d) What type of metamorphis does the organism show? **(1 mark)**

4. The epidermis of a leaf is adapted to have the specialized cells known as the guard cell such as shown below.



(a) **(i)** Name the structure labelled **X** on the diagram. **(1 mark)**

(ii) State three adaptations of the guard cell to its function of opening and closing of stomata in plants. **(3 marks)**

(b) The mammalian lung is known to have adapted the mammal to terrestrial habitat by having a pleural membrane.

(i) State **two** functions of a pleural membrane that gives the mammal advantage over other organisms. **(2 marks)**

(ii) Name **two** diseases of the respiratory system. **(2 marks)**

5. The human ear has the following structures;

(i) Auditory meatus

(ii) ear drum

(iii) eustachian tube

(iv) ear ossicles and (v) cochlea.

(a) Name **two** functions of the mammalian ear. **(2 marks)**

(b) For each of the structures above, state its function. **(5 marks)**

(i) Auditory meatus

(ii) Eardrum

(iii) Eustachian tube

(iv) Ear ossicles (v) Cochlea

(c) Name a defect caused by damage of the cochlea. **(1mark)**

SECTION B:

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

6. A physiologist working to determine the amount of glucose levels in the iliac artery and hepatic vein per hour after a heavy carbohydrate meal in mg/100ml of blood collected and recorded the following data in a 24 hour period. Study the data and use it to answer the questions that follow.

Amount of glucose in mg/100 ml	**Iliac artery**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**8**	**12**	**20**	**24**	**20**	**24**	**22**	**28**	**20**
	Hepatic vein	**20**	**22**	**24**	**24**	**24**	**24**	**18**	**12**	**6**	**4**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
	Time of day	**00**	**1.00**	**2.00**	**3.00**	**4.00**	**5.00**	**6.00**	**7.00**	**8.00**	**9.00**	**10.00**	**11.0**	**12.0**	**13.0**	**14.0**	**15.0**	**16.00**

(a) On the same axes plot a line graph to show amount of glucose in mg/100ml of blood against time of the day in a 24hour day up to 4.00 p.m. **(8 marks)**

(b) At what time of day was the amount of glucose the same in the iliac artery and iliac vein? **(1 mark)**

(c) Account for the rise in glucose levels in the iliac artery peaks at: **(3 marks)**

(i) 11.00 hrs a.m.

(ii) 14:00 hrs p.m.

(d) Which organ and hormone is responsible for raising the sugar levels in Hepatic vein between 00.00 hrs – 2.00 hrs a.m**.** **(2 marks)**

Organ

Hormone

(e) Name the hormone responsible for the fall of glucose and the complex polysaccharide that forms between 14:00 hrs p.m. and 6.00 hrs p.m. **(2 marks)**

Hormone -

Complex polysaccharide -

(f) Name a disease that would have resulted if the hormone in (e) above failed to be produced. **(2 marks)**

7. (a) Explain the role of the following factors in germination

(i) Oxygen (**2marks)**

(ii) Water **(3 marks)**

(iii) Gibberellic acid **(1 mark)**

7.(i) Describe the various modes of adaptation for the flat worm of the blood ***Schistosoma mansonii*** **(8 marks)**

(ii) State the effects of *Schistosoma mansonii* on its primary host, the human **(12 marks)**

8. (a) Describe how the digestion of a protein is achieved in the following portions of the alimentary canal.

(i) Stomach **(4 marks)**

(ii) Duodenum **(4 marks)**

(b) (i) Describe the process of absorption at the root hair to the xylem of the root. **(8 marks)**

(ii) Describe how temperature and light intensity affect the rate of transpiration. **(4 marks)**

NAME……ADM NO……

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BIOLOGY MOCKS

SERIES 1 TRIAL 9 PAPER 1

Kenya Certificate of Secondary Exams

TIME:2HRS

SECTION A (40MARKS)

Answer ALL questions in this section in the spaces provided.

1. Name the organelles that are abundant in:

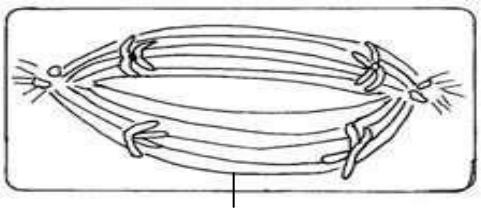
(a) Goblet cells **(1 mark)**

(b) Liver cells **(1 mark)**

2. Give a reason why it is difficult to calculate Respiratory Quotient (RQ) in plants. **(2 marks)**

3. List **three** advantages of asexual reproduction in plants. **(3 marks)**

4. The diagram below represents a stage during cell division.



M

(a) **(i)** Identify the stage of cell division. **(1 mark)**

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

(b) Name the structures labelled **M**. **(1 mark)**

5. Explain why there is increased heart beat during vigorous exercise in man. **(2 marks)**

6. (a) State **two** characteristic features of members of division pteridophyta. **(2 marks)**

(b) Give **one** way in which pteridophyta differ from spermatophyta. **(1 mark)**

7. **(a)** Explain the role of antidiuretic hormone when there is excess water in the human body. **(3 marks)**

(b) State the kidney disorder characterized by production of large volume dilute urine. **(1 mark)**

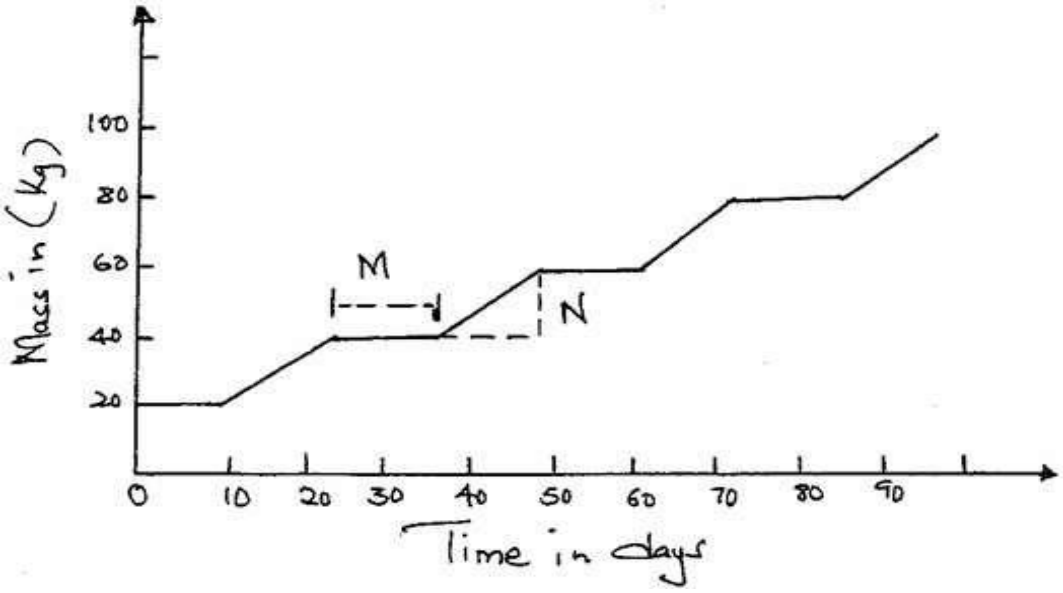
8. (a) State **one** role of each following hormones in the menstrual cycle.

(i) Follicle stimulating hormone. **(1 mark)**

(ii) Luteinising hormone. **(1 mark)**

(b) Explain why hormone testosterone still exerts it's influence even when vas deferens have been cut. **(2 marks)**

9. The graph below represents growth pattern in a certain group of animals. Study it and answer the questions that follow.



(a) Name the type of growth curve. **(1 mark)**

(b) Name the animal phylum that shows this type of growth pattern. **(1 mark)**

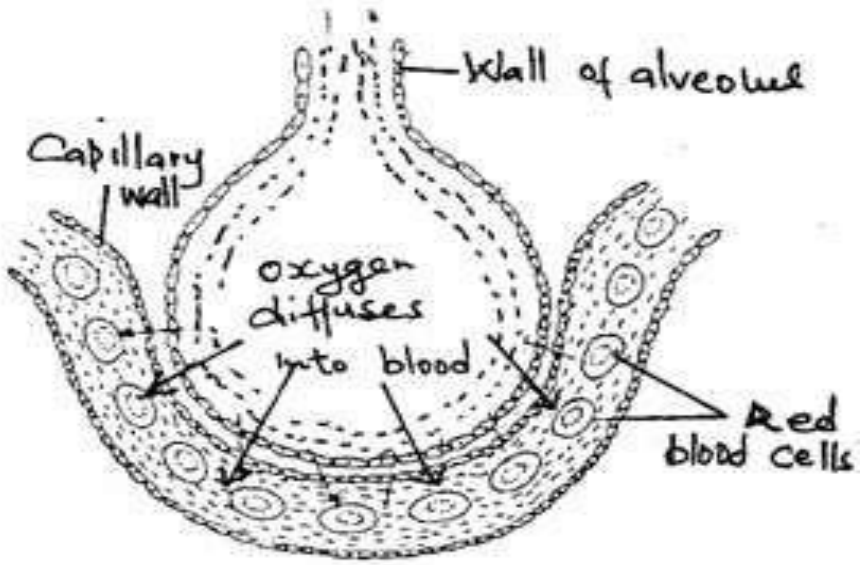
(c) Name the process that occurs in part **M**. **(1 mark)**

10.(a) Name the bacteria found in ceacum of herbivores. **(1 mark)**

(b) State the association of the bacteria named in (a) above with herbivores. **(1 mark)**

11. During germination and early growth, the dry weight of endosperm decreases while that of the embryo increases. Explain. **(2 marks)**

12. The figure below shows an alveolus in which gaseous exchange take place.



(a) (i) Define the term diffusion. **(1 mark)**

(ii) What causes oxygen to diffuse into the blood from the alveoli? **(1 mark)**

(iii) List **two** features of gaseous exchange surfaces in animals, such as humans that are evident in the diagram above**.** **(2 marks)**

13. State **two** characteristics that researchers use/select in breeding programmes. **(2 mark)**

14. (a) Which component of the blood gives the body immunity? **(1 mark)**

(b) Distinguish between natural and acquired immunity. **(2 marks)**

15. (a) Define ‗osmosis'. **(2 marks)**

(b) State the importance of osmosis in plants. **(2 marks)**

16. (a) Give **two** evidences that support the theory of organic evolution. **(2 marks)**

(b) Why is Lamarcks theory of evolution not accepted by biologists today. **(2 marks)**

17. The number and distribution of stomata on three different leaves are shown in the table below.

Leaf	Number of stomata	
	Upper epidermis	Lower epidermis
A	300	0
B	150	200
C	2	13

(a) Suggest the possible habitat of the plant from which the leaves were obtained. **(3 marks)**

(b) State **one** modification found in the stomata of leaf **(C)**. **(1 mark)**

18. (a) State **one** way through which herbaceous plants achieve support. **(1 mark)**

(b) Name **three** supporting tissues in plants. **(3 marks)**

19. (a) One of circulatory systems in animals is open circulatory system. Give the name of the other type of circulatory system found in animals. **(1 mark)**

(b) State **two** advantages of the circulatory system you have named in (a) above. **(2 marks)**

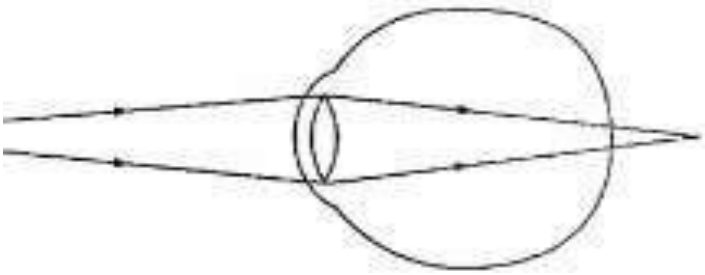
20. State **two** advantages of metamorphosis to the life of insects. **(2 marks)**

21. There are at least 205 known sex-linked recessive disorders.

(a) What is meant by term sex-linkage? **(2 marks)**

(b) Name **two** sex-linked traits in humans. **(2 marks)**

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



(a) Name the defect. **(1 mark)**

(b) Explain how the defect named in (c) above can be corrected. **(2 marks)**

23. (a) State the importance of the following processes that take place in the nephron of a human kidney.

(i) Ultrafiltration. **(1 mark)**

(ii) Selective reabsorption. **(1 mark)**

(b) In which part of the nephron does ultra filtration take place? **(1 mark)**

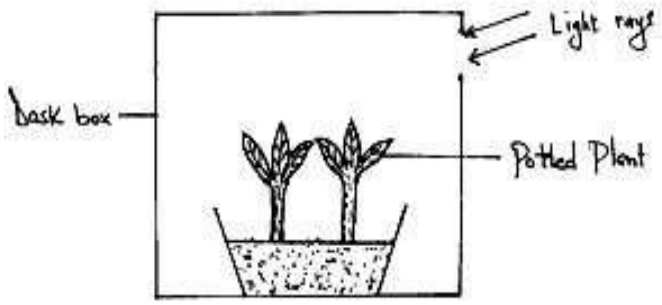
24. A biological washing detergent contains enzymes which remove stains like mucus and oils from clothes which are soaked in water with the detergent.

(a) Name the two groups of enzymes that are present in the detergent. **(2 marks)**

(b) Why would the stains be removed faster with the detergent in water at 35□C rather than at 15□C? **(2 marks)**

25. Explain why it is important to go for Voluntary Counseling and Testing (VCT) on HIV/AIDS. **(2 marks)**

26. In an experiment young potted seedlings were placed in a dark box with unilateral light source as shown below.



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

(b) State the observation made of on the seedling after 3 days. **(2 marks)**

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BIOLOGY MOCKS

SERIES 1 TRIAL 9 PAPER 2

Kenya Certificate of Secondary Exams

TIME:2HRS

SECTION A (40MARKS)

Answer ALL questions in this section in the spaces provided

1. Haemophilia is a sex linked characteristic caused by a recessive gene located on one of the sex chromosomes.

a) Name the chromosome onto which the gene for haemophilia is linked to **(1mk)**

b) A normal man for the condition marries a normal woman for the condition but sadly one of their sons develop this condition from birth.

i) What are the likely genotypes of this couple? **(2mks)**

Man

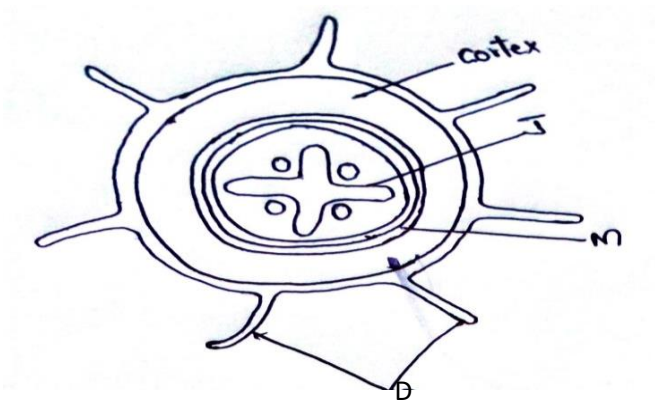
Woman

ii) Using a punnet square, carry out a cross to show why the couple gave birth to haemophiliac son **(4mks)**

Use (H),to represent the gene for normal condition and (h) to represent the gene for haemophilia

iii) Why is this haemophiliac condition very common in males than in female **(1mk)**

2. The figure below represents an organ obtained from a section of a plant. Use it to answer questions that follow.



a) **i)** Name the organ from which the above section was obtained. Give a reason for your answer **(2mks)**

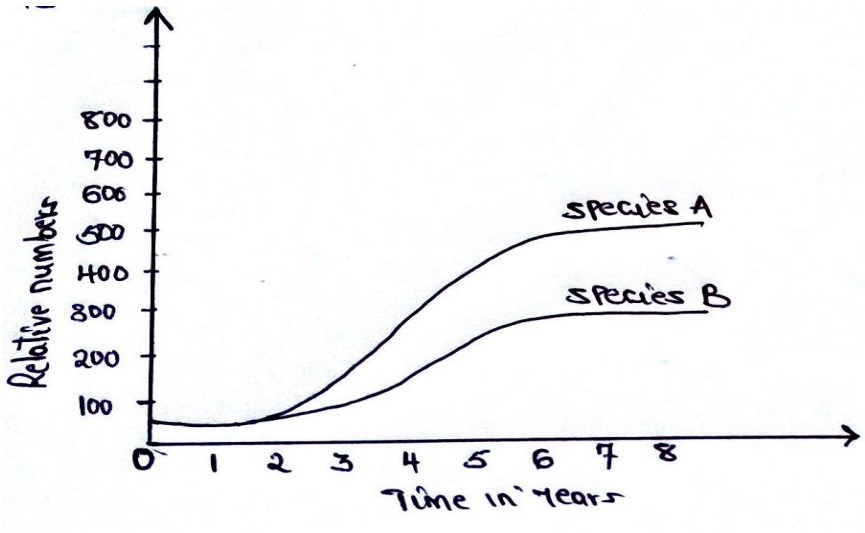
ii) Structure labelled J is described as a mechanical tissue. Explain **(1mk)**

b) **i)** Name the process by which water passes across structure M **(1mk)**

ii) Explain two ways by which cells with structures Dare adapted to their functions **(2mks)**

c) Name two strengthening materials that strengthen the collenchyma tissue **(2mks)**

3. species were introduced into an ecosystem at the same time and in equal numbers. The graph below represents their populations during the first seven years. Study the graph and answer the questions that follow.



a) **i)** Which species has a better competitive ability **(1mk)**

ii) Give reason for your answer **(1mk)**

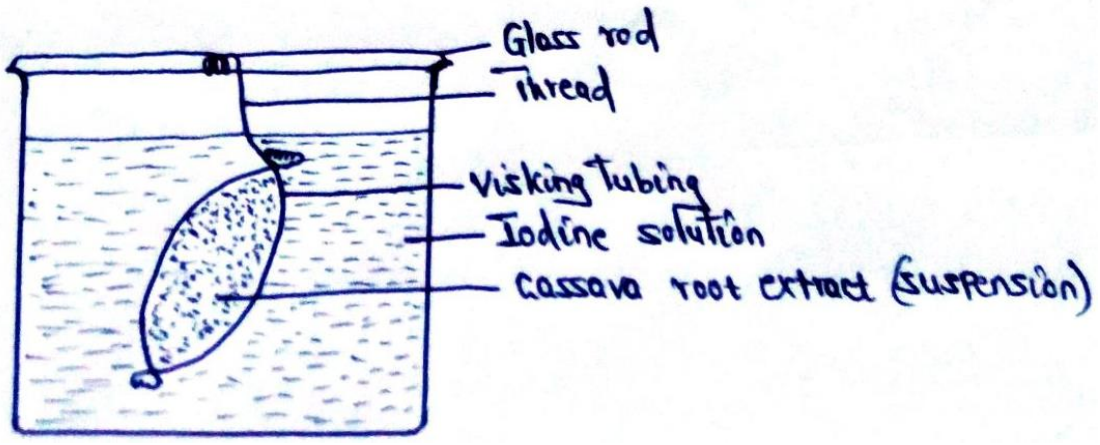
b) Account for the shape of the curve of species A between

i) One year and three years **(2mks)**

ii) Three years and seven years **(2mks)**

c) A natural predator for species A was introduced into the ecosystem. With a reason state how the population of each species would be affected **(2mks)**

4. A student from Abogeta secondary set up an experiment as illustrated below.



The visking tubing was left in iodine solution for 4 hours.

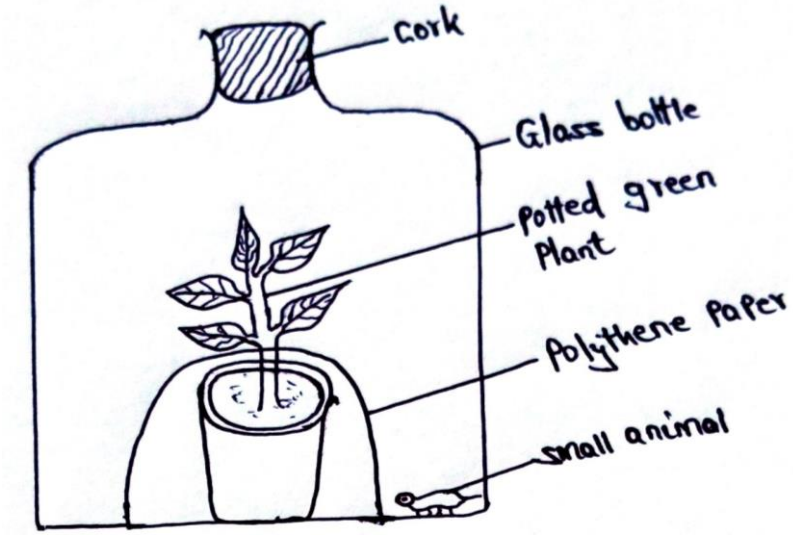
a) State the physiological process being investigated **(1mk)**

b) i) What were the expected results in the visking tubing and in the beaker **(2mks)**

ii) Account for your expected result in visking tubing **(2mks)**

c) Mention three factors that influences the rate of active transport **(3mks)**

5. An experiment was set up to investigate a factor in autotrophism in green plants.



Vaseline was applied at joint between the cork and the mouth of glass bottle and set up was left under sunlight for 6 hours.

a) Why was it necessary;

i) To apply Vaseline **(1mk)**

ii) To cover the pot with polythene paper **(1mk)**

iii) What was the purpose of including the small animals? Give two reasons. **(2mks)**

b) i) What would happen to the small animal if the set up was left over night in darkness **(1mk)**

ii) Account for the answer in b (i) above **(1mk)**

c) State the respiratory surface of the following organism **(2mks)**

i) Amoeba

ii) Fish

SECTION B (40MKS)

Answer question 6 (Compulsory) and choose either question 7 or 8

6. A hungry person had a meal, after which the concentration of glucose and amino acids in the blood were determined. This was measured hourly as the blood passed through the hepatic portal vein and the iliac vein in the leg. The results were as shown in the table below.

Time (Hrs)	**Concentration of contents in Hepatic portal vein (Mg/100ml)**		**Concentration of contents in the iliac vein of the leg (Mg/100ml)**	
	Glucose	**Amino acids**	**Glucose**	**Amino acids**
0	85	1.0	85	1.0
1	85	1.0	85	1.0

2	140	1.0	125	1.0
3	130	1.5	110	1.5
4	110	1.5	90	3.0
5	90	3.0	90	2.0
6	90	2.0	90	1.0
7	90	1.0	90	1.0

a) Using the same axes draw graphs of concentration of glucose in the hepatic portal vein and the iliac vein in the leg against time **(7mks)**

b) Account for the concentration of glucose in the hepatic portal vein from;

i) 0-1 hour **(2mks)**

ii) 1-2 hours **(3mks)**

iii) 2-4 hours **(3mks)**

iv) 5-7 hours **(2mks)**

c) Account for the difference in the concentration of glucose in hepatic portal vein and the iliac vein between 2 and 4 hours **(2mks)**

d) Using the data provided in the table explain why the concertation of amino acids in the hepatic portal vein took longer to increase **(1mk)**

Essays

7. a) Describe the opening and closing of the stomata using the photosynthetic theory **(10mks)**

b) Describe blood sugar regulations in mammals **(10mks)**

8. a) Describe the adaptation of the following plants to their habitat;

i) Xerophytes **(15mks)**

ii) Hydrophytes **(5mks)**

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

BIOLOGY MOCKS

SERIES 1 TRIAL 10 PAPER 1

Kenya Certificate of Secondary Exams

TIME:2HRS

SECTION A (40MARKS)

Answer ALL questions in this section in the spaces provided

1. **(i)**Name the basic functional unit of a kidney. **(1mark)**

(**ii)** Name two support tissues in plants strengthened with lignin. (**2marks)**

2. What is binomial nomenclature? **(1mark)**

State the importance of the following in a living organism

(a) Locomotion **(2marks)**

(b) Respiration **(1mark)**

3. State the functions of the following in the heart**.** **(2marks)**

(a) Sino Atrio Node (SAN)

(b) Interventricular septum

4. The table below shows percentage water gain in man and kangaroo rat.

Gains	Human beings	Kangaroo rat
Drinking	48%	0%
Water in food	40%	10%
Metabolic water	12%	90%

Explain why a Kangaroo rat gains a higher percentage of metabolic water than human beings. **(2marks)**

5. State three functions of adrenaline released when a person is faced with an emergency situation**.** **(3marks)**

6. Name a disadvantageous gene that is dominant **(1mark)**

7. State the importance of metamorphosis in an insect. **(2marks)**

8. Name the causative agent of the following diseases. **(3marks)**

(a) Whooping cough

(b) Typhoid

(c) Syphilis

11 (a) Name two causes of water pollution **(2marks)**

(b) For each cause named in 11(a) above state a control measure. **(2marks)**

12. Define the following terms in reference to fish locomotion **(3marks)**

(a) Pitching

(b) Rolling

(c) Yawing

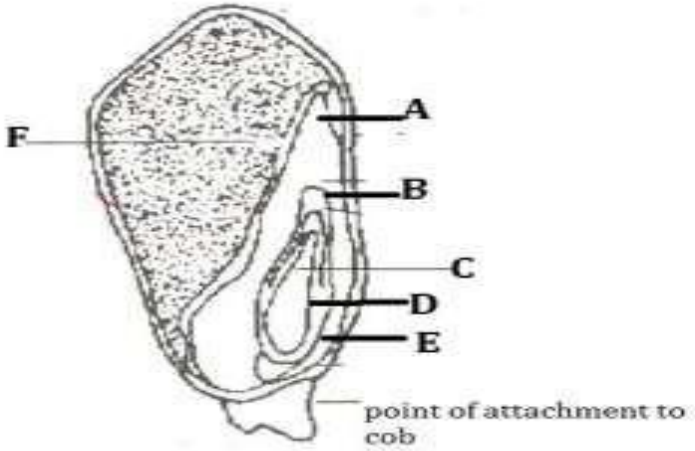
13. Name the type of reproduction in the following organisms. **(3marks)**

(a) Yeast

(b) Bacteria

(c) Rhizopus

14. The diagram below shows the structure of a monocotyledonous seed



(a) Name the parts B and D **(2marks)**

(b) Name the parts that would stain blue black with iodine solution. **(2marks)**

15. State the importance of

(a) Aerenchyma tissue in hydrophytes **(2marks)**

(b) Salts glands in halophytes **(1mark)**

16.(a) Explain why osmosis is a special type of diffusion**.** **(1mark)**

(b.) What is the importance of carriers in active transport**.** **(1mark)**

17. Name the cell organelles which would be abundant in **(2marks)**

(a) Sperm cell

(b) Pancrease

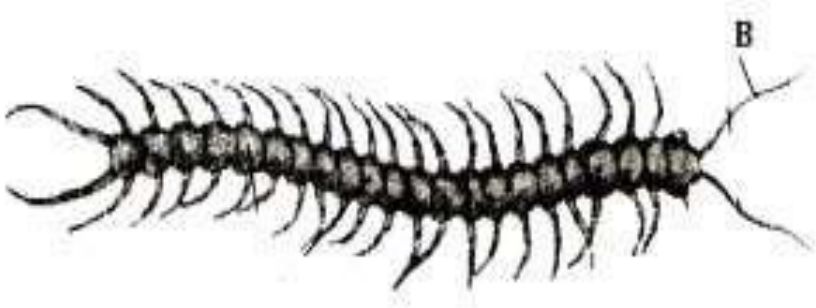
18.(a) Name the respiratory surface of an insect **(1mark)**

(b) State two adaptations of the respiratory surface named in (a) above. **(2 mks)**

19. State three properties of proteins. **(3marks)**

20. What is the role of light energy during photosynthesis **(2marks)**

21. Use the diagram below to answer the questions



(a) Identify the class which the organism belongs **(1mark)**

(b) Give two observable characteristics to justify your answer in (a) above **(2marks)**

22. Name two main mineral ions required for transmission of a nerve impulse **(2marks)**

23. Name an old age disease associated with the following body organs **(2marks)**

(a) Eye

(b) Ear

24. Explain the following terms as used in evolution. **(3marks)**

(a) Struggle for existence

(b) Divergent evolution

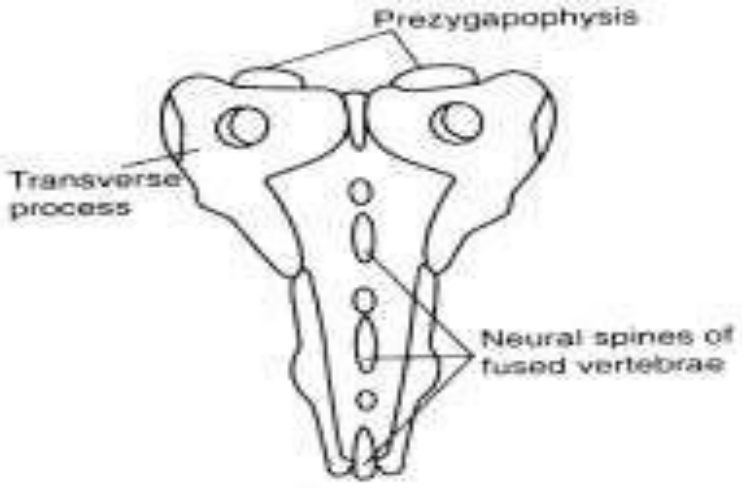
(c) Vestigial structure

25. State two adaptations of xylem tissues in plants. **(2marks)**

26.(a) Name a compound that stores energy in a cell **(1mark)**

(b) Explain why cell membrane is semi-permeable. **(1mark)**

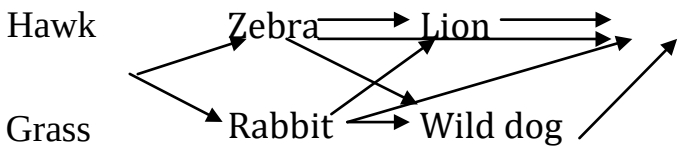
27. The diagram below shows type of vertebrae fused to form a rigid structure.



(a) What is the name of the rigid structure? **(1mark)**

(b) What is the importance of the rigid structure in human beings? **(2marks)**

28. Study the food web below and answer the questions below



(a) Name the organism occupying the highest trophic level **(1mark)**

(b) Construct two food chains with wild dog as secondary consumer. **(2marks)**

29. State three roles of Gibberellins in plant **(3marks)**

30. Cardiac muscles are myogenic while skeletal muscles are neurogenic. Explain **(2marks)**

31.(a) State two adaptations of the oviduct in female reproductive system. **(2marks)**

(b) Name the hormone involved in

(i) Milk production **(1mark)**

(ii) Development of male secondary sexual characteristics. **(1mark)**

32. Explain why it is difficult for scientist to make a vaccine against plasmodium which causes malaria.

NAME……ADM NO……

SCHOOL……..CLASS……

DATE……

BIOLOGY MOCKS

SERIES 1 TRIAL 10 PAPER 2

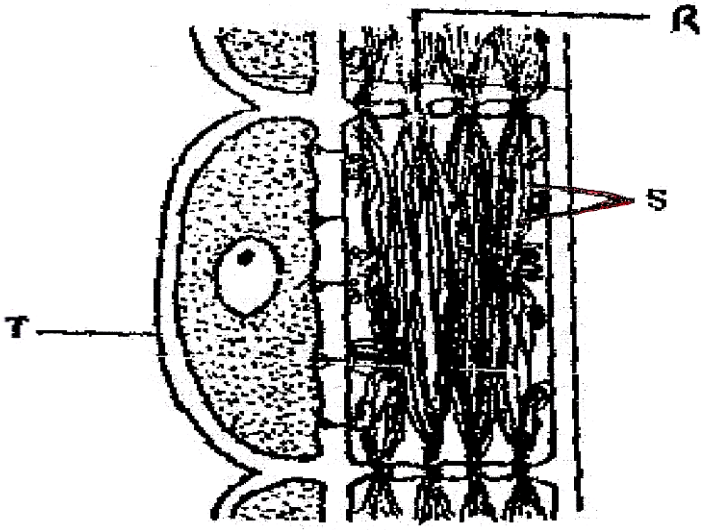
Kenya Certificate of Secondary Exams

TIME:2HRS

SECTION A (40MARKS)

Answer ALL questions in this section in the spaces provided.

1. The diagram below represents part of phloem tissue.



(a) Name the structures labeled R and S and the cell labeled **T.** **(3mks)**

R:

S:

Cell labeled **T:**

(b) State the function of the structure labeled **S.** (**1mk)**

(c) Explain why xylem is a mechanical tissue. **(2mks)**

(d) **(i)** State the effect of removal of the cell labeled **T.** **(1mk)**

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

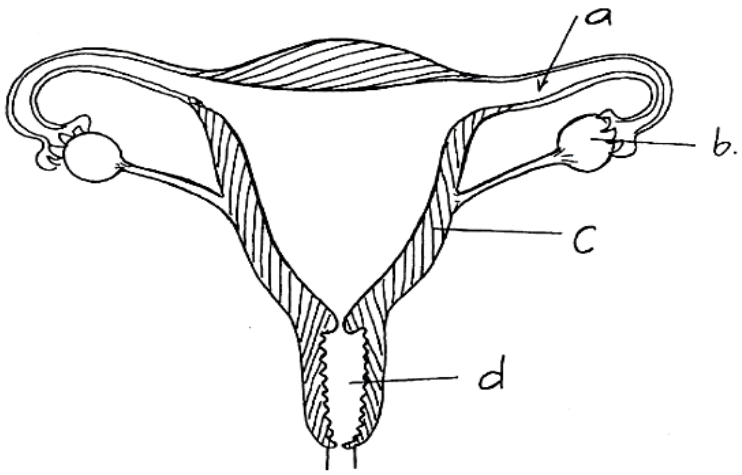
2. **(a)** Describe the following chromosomal mutations:

(i) Inversion **(2mks)**

(ii) Translocation (**2mks)**

(b) In mice the allele for **black fur** is **dominant** to the allele for **brown fur**. What percentage of offspring would have brown fur from a cross between 2 heterozygous black mice? Show working. Use letter **B** to represent the allele for **black colour**. **(4mks)**

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



(a) **(i)** Which part marked a, b, c and d, when defective after implantation may lead to abortion **(1mk)**

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

(b) The part labeled b can be removed after 4 months of pregnancy without interfering with the pregnancy. Explain. **(2mks)**

(c) Under each of the following, state the name of the causative agent.

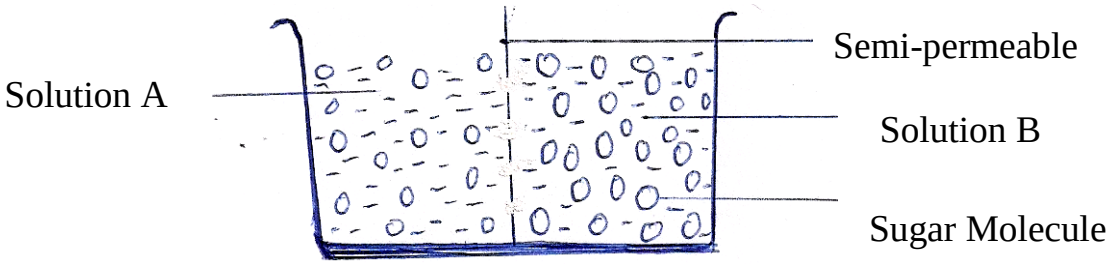
(i) Syphillis (**1mk)**

(ii) Gonorrhea **(1mk)**

(iii) AIDS

(d) State **<u>two</u>** disadvantages of external fertilization. **(2mks)**

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



(a) Which solution has higher concentration of free water molecules? **(1mk)**

(b) Which solution is more concentrated? **(1mk)**

(c) In which direction will osmosis take place? Indicate using an arrow on the diagram. **(1mk)**

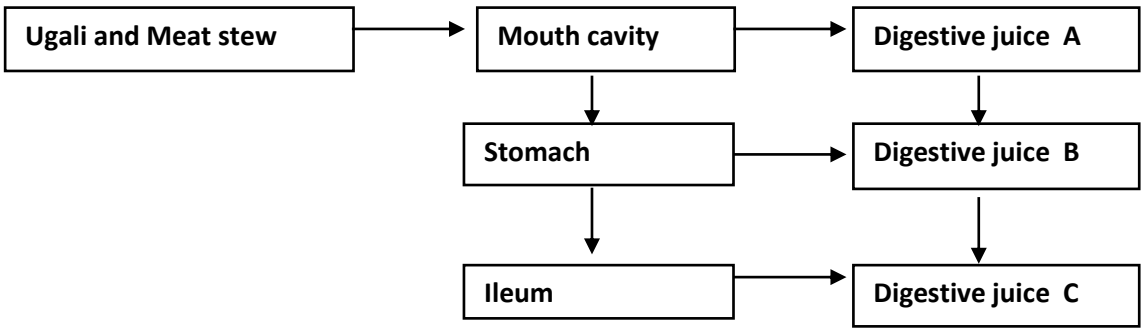
(d) What does semi-permeable membrane represent in an animal cell **(1mk)**

(e) i) Define the term active transport **(1mk)**

ii) Why is oxygen important in active transport in cells **(2mks)**

f) When red blood cells are placed in a hypotonic solution they burst. Name the process involved. **(1mk)**

5. The flow diagram below represents passage of a meal through the human digestive system. Study the diagram and answer the questions that follow.



(a) Name the physical process that will occur in mouth cavity **(1mk)**

(b) Name the digestive juices **B** and **C** **(2mks)**

B-

C-

(c) Explain **two** ways in which the digestive system is protected from corrosive effects of digestive juices. **(2mks)**

(d) Name the hormone that stimulates secretion of juice **B**. **(1mk)**

(e) Identify **two** contents of digestive juice **A** **(2mks)**

SECTION B – 40 MARKS

Answer question 6 (Compulsory) and any other one question from this section.

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

Time after planting	Dry weight of endosperm	Dry weight of embryo (mg)	Total dry weight (mg)
0	43	2	45

2	40	2	42
4	33	7	40
6	20	17	37
8	10	25	35
10	6	33	39

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

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

(c) Account for:

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

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

(iii) Decrease in total dry weight from day 0 to day 8. **(2mks)**

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

(d) State **<u>one</u>** cause of dormancy: **(2mks)**

(i) Within a seed

(ii) Outside the seed

e) State two ways of breaking seed dormancy **(2mks)**

7. Explain the role of human skin in:

(a) Thermo regulation. **(14mks)**

(b) Protection **(6mks)**

8. Explain various ways in which fruits and seeds are adapted to dispersal. **(20mks)**



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