KCSE MOCKS

BIOLOGY PAPER 1

Consists 3 KCSE Mock set Exams.

(Class of KCSE March 2021)

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PRE-MOCK 1

Name: .....Index no: .....

School: .....Candidate's sign: .....

Date: .....Class: .....

231/1

BIOLOGY

PAPER 1

TIME: 2 HOURS

KCSE PRE-MOCK 1

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

BIOLOGY

Paper 1 Time:

2 Hours

INSTRUCTIONS TO CANDIDATES:

- *Write your **name**, **name of your school** and **index number** in the spaces provided.*
- *Sign and write date of examination in the spaces provided above.*
- *Answer all the questions in the spaces provided.*
- *This paper consists of **12** printed pages. Candidates should check to ascertain that all the pages are printed as indicated and that no questions are missing.*

For Examiner's Use Only:

QUESTIONS	MAXIMUM SCORE	CANDIDATES SCORE
1- 22	80	

1. Name the branch of biology that deals with the of the following

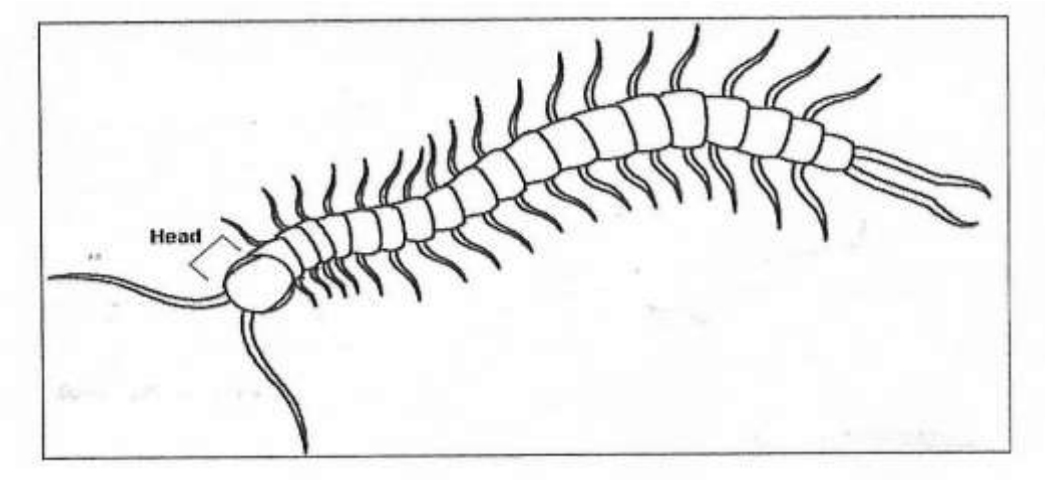
   (a) Study of cockroaches, housefly and locusts. (1 mark)

   .....

   (b) Study of yeast, mushroom, penicillium and toadstools. (1 mark)

   .....

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



   With reasons name the class to which the organism belongs to. (1 mark)

   Class.....

   Reasons (2 marks)

   .....

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3. Some sorghum seeds were soaked in water for two days. They were then broken into small pieces and placed on the surface of agar containing starch. After two days, it was found that the agar no longer contained starch.

   (a) How was the test for starch in the agar carried out? (1 mark)

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   (b) Explain why there was no starch in the agar after two days. (2 marks)

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(c) Why were the sorghum seeds broken into smaller pieces? (1 mark)

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(d) State the observation made when the seeds were soaked in boiling water. (1 mark)

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4. Under certain conditions, the carbon(IV) oxide concentration in the blood of a mammal rises above normal level. State two physiological changes that occur in the body to lower the carbon(IV) oxide back to normal. (2 marks)

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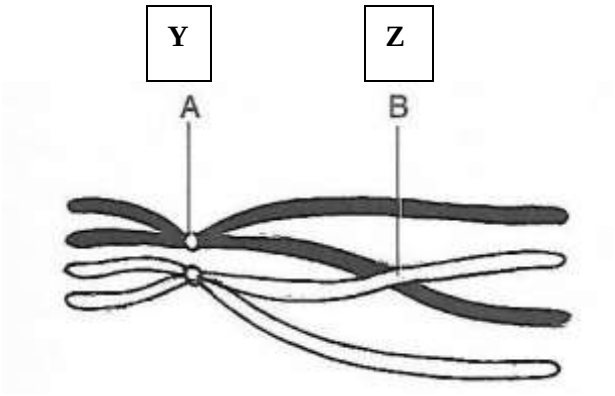
5. The diagram below shows a phenomenon which occurs during cell division.



(a) What is the biological importance of the part labelled **Z**. (2 marks)

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.....

.....

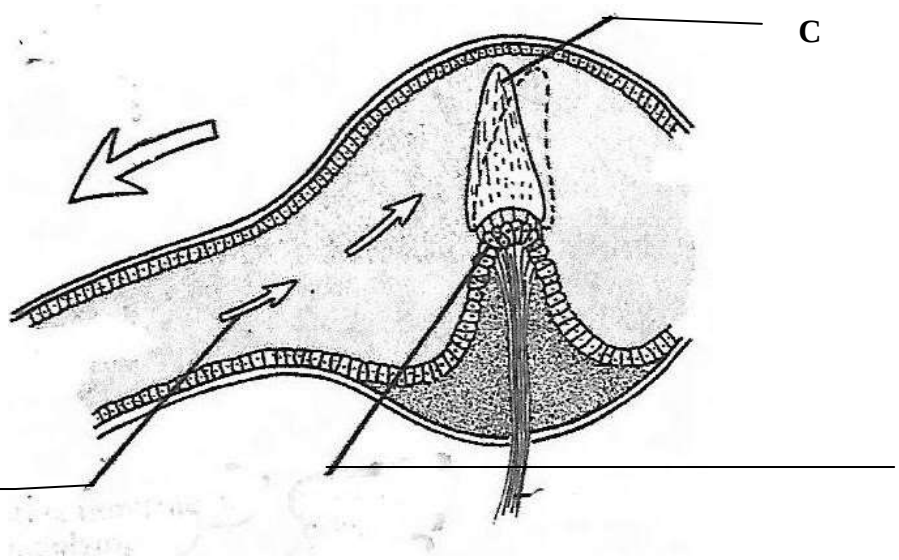
(b) Which cell division does the above phenomenon occur? (1 mark)

.....

(c) Name the organs in human beings in which the phenomenon occurs? (1 mark)

.....

6. The diagram below shows a part of the ear responsible for posture.



(a) (i) What is the name of the part shown by the diagram above? (1 mark)

.....

(ii) Where in the ear is the part located? (1 mark)

.....

(iii) What is the role of the part above? (1 mark)

.....

(b) Name the part labelled **C** and **D**. (2 marks)

C.....

D.....

7. A layer of glycerine was applied on upper surface of a freshwater floating plant that had been kept in the dark for 24 hours. The plant was left undisturbed in bright light. After three hours test for starch carried out on the leaves produced a brown colour of iodine solution. Account for the observation. (3 marks)

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8. (a) A plastic container fill of water was stoppered using a piece of stem obtained from a young maize plant whose bark had been peeled off. The next day it was noted that the stopper closed the container very tightly. Explain. (3 marks)

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(b) (i) State the observation made when a similar experiment was set up but using boiled piece of maize stem obtained from a young maize plant whose bark had been peeled off. (1 mark)

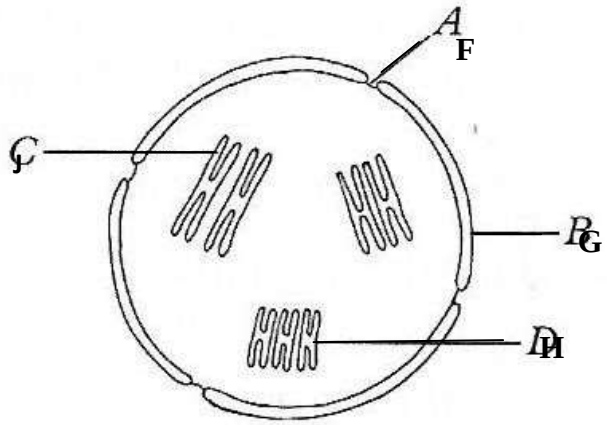
.....

(ii) Explain the observation stated in (b) (i) above. (1 mark)

.....

.....

9. The figure below represents a cell organelle found in the somatic cell of a certain organism.



(a) Name parts labelled **F** and **J**. (2 marks)

F

.....

J.....

(b)(i) Name the type of mutation illustrated above. (1 mark)

.....

(ii) Explain your answer in (b) (i) above. (1 mark)

.....

(c) Determine the total number of chromosomes in a normal gamete cell of the organism.

(1 mark)

.....

10. State **two** functions of calcium in the human body. (2 marks)

.....

.....

11. Two farmers prepared two ponds **Q** and **R** and introduced equal number of fish in each pond. The fish in pond **Q** died within seven days of being introduced into the pond. Those of pond **R** survived. On close examination of the ponds, it was found that one of the ponds was full of algae and the other had no algae.

(a) In which of the two ponds were the algae present? (1 mark)

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(b) What was the cause of the death of fish in one of the ponds? (1 mark)

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(c) State the significance of the algae in the pond? (2 marks)

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12. A form four student was walking around the school compound and saw leaves from nandi flame tree on the ground.

(a) Name the hormone responsible for this phenomenon. (1 mark)

.....

(b) State the significance of the above phenomenon to the tree. (2 marks)

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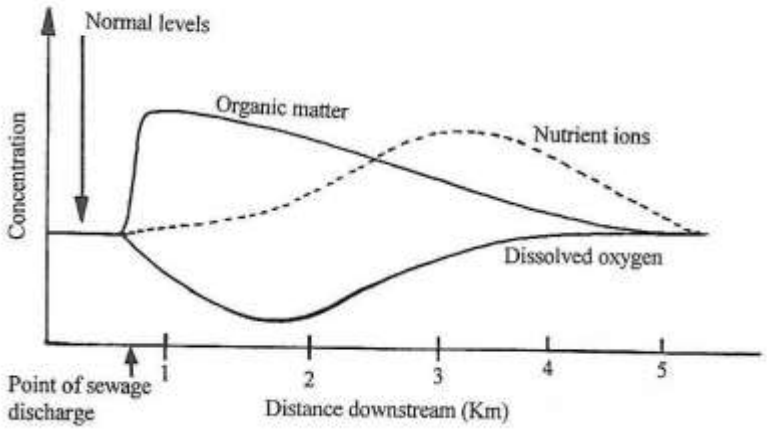
13. The figure below shows the change in the concentration of various substances in a river following the discharge of untreated sewage into it.



(a) Account for the changes in concentration of:

(i) Organic matter. (1 mark)

.....

.....

(ii) Nutrient ions. (1 mark)

.....

.....

(ii) Dissolve oxygen. (1 mark)

.....

.....

(b) Describe the changes expected in:

(i) Fish population between the point of sewage discharge and the point where the organic matter returns to normal levels.
(1 mark)

.....

.....

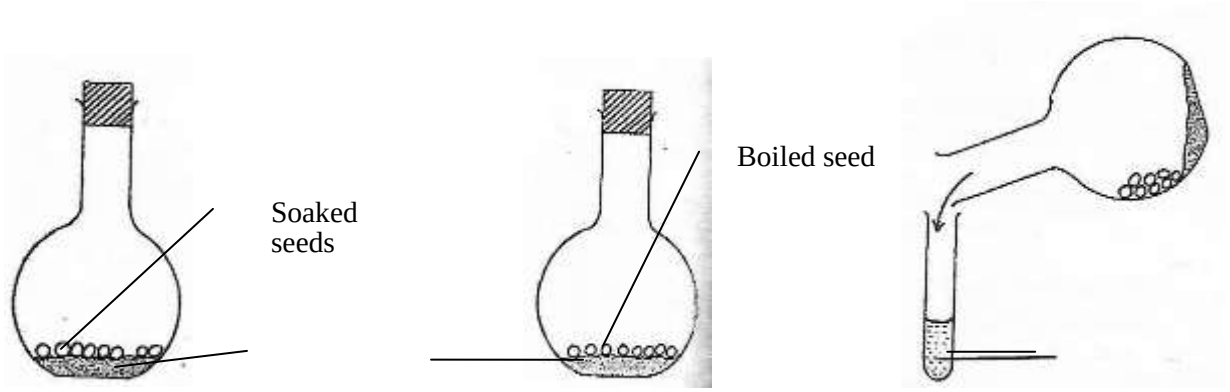
(ii) Water plants and photosynthetic algae about one and half kilometres downstream from
the point of sewage discharge. (1 mark)

.....

.....

14. Short-horned grasshopper moults five times before reaching adult size. Draw the kind of growth curve you would expect for the grasshopper if the changes in its length are plotted against time.
(2 marks)

15. Wet cotton wool was put in two flasks **M** and **N**. Soaked seeds are added to **M** and an equal number of boiled seeds to **N**. Both groups of seeds were first soaked in sodium hypochlorite solution before being put in the flasks. The flasks were securely corked and left in the same conditions of light and temperature for ten days. The cork from each flask was removed and each tilted over a test-tube of calcium hydroxide solution as shown in **T**.



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

Wet cotton wool Calcium hydroxide

.....

.....

(b) Explain the observations made in Flask **M** and **N**. (3 marks)

M

.....

.....

N

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(c) Why were the seeds soaked in sodium hypochlorite for fifteen minutes? (1 mark)

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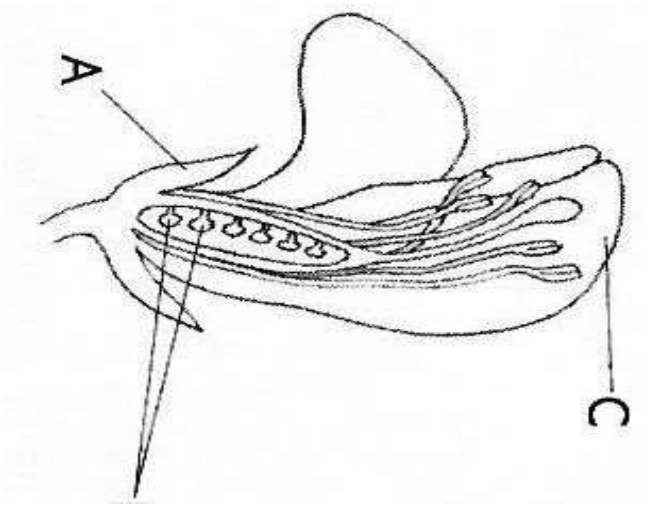
16. The diagram below shows section through the flower of a certain plant.



(a) (i) To which class does the plant from which the flower was obtained belong to? (1 mark)

.....

(ii) State the reason for your answer in (a)(i) above. (1 mark)

.....

(b) State the placetation. (1 mark)

.....

(c) (i) Name the part labelled **K**. (1 mark)

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(ii) What is the fate of the part labelled **S** during fruit development? (1 mark)

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17. State two ways in which the skeletal muscle fibres are adapted to their function. (2 marks)

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18. State the functions of lymph nodes. (2 marks)

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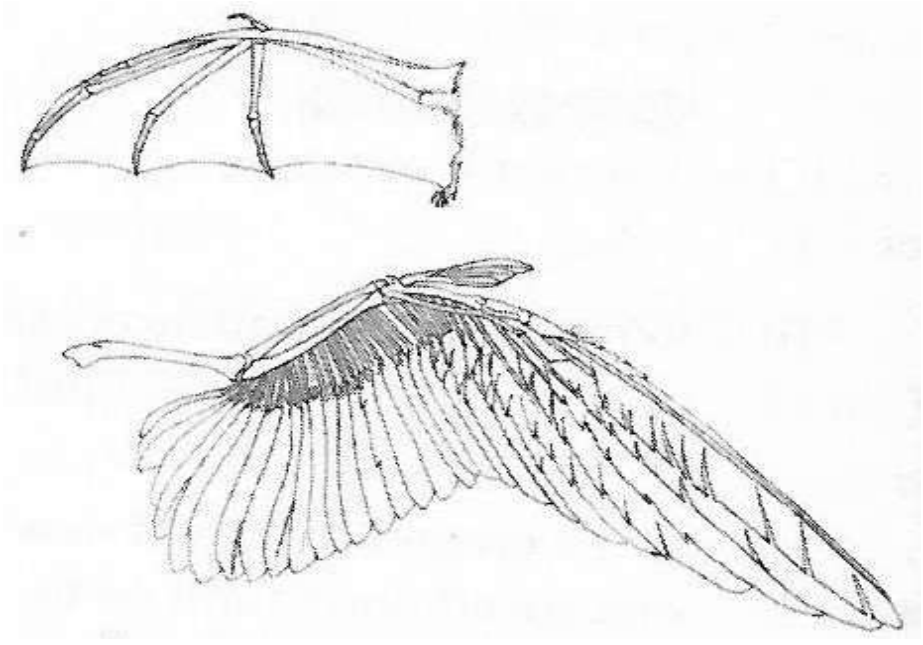
19. The following diagrams represent different animal structures.



(a) (i) What type of structures are represented by the diagram above? (1 mark)

.....

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

.....

(ii) Name the evolutionary phenomenon represented by the structures. (1 mark)

.....

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

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20. A form four student was found to have blood group AB^+.

(a) What antigens does this blood group have? (1 mark)

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.....

(b) What antibodies are present in the blood? (1 mark)

.....

(c) The student was injured and required blood transfusion. Which blood groups can he receive the blood from? (1 mark)

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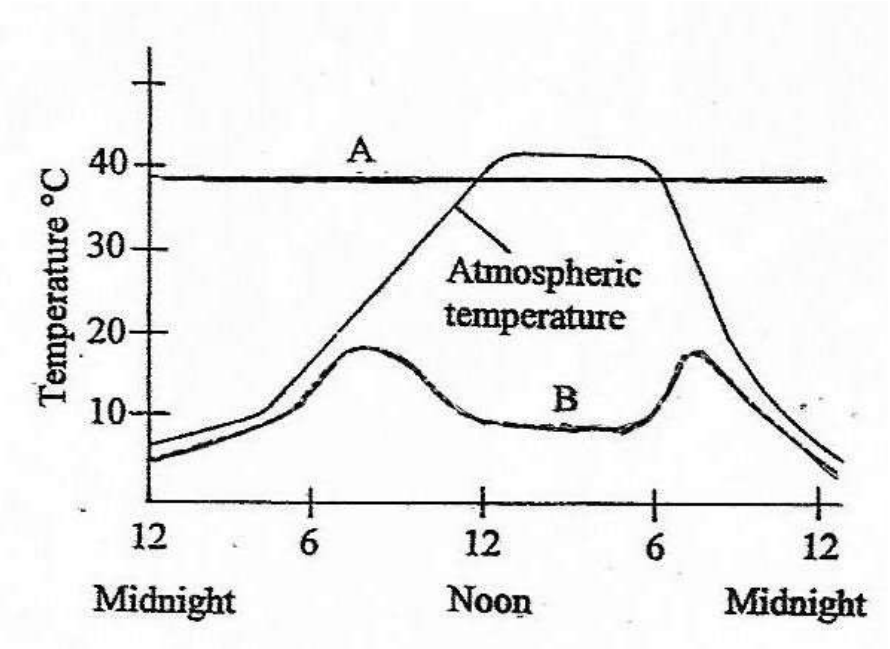
21. The diagram below illustrates the variation in atmospheric temperature in the course of a day and the body temperature of two animals **A** and **B**. Study it and answer the questions that follow.



(a) Describe how animal **A** regulates its body temperature between 12 noon and 6.00 pm. (3 marks)

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(b) State the activities that account for the body temperature of animal **B** between 9.00 am and 6.00 pm. (1 mark)

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22. (a) State two adaptations that enable birds to fly. (2 marks)

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(b) State two functions of the cuticle in insects. (2 marks)

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MOCK 1

Name…… Index No……/…….

School…… Candidates Signature……

Date …….

231/1

BIOLOGY

THEORY

Paper 1

2 Hours

INSTRUCTIONS TO CANDIDATES

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

For Examiners use only.

Question	Maximum Score	Candidates Score
1 – 25	80	

1.State three activities of the cell that are controlled by the nucleus (3mks)

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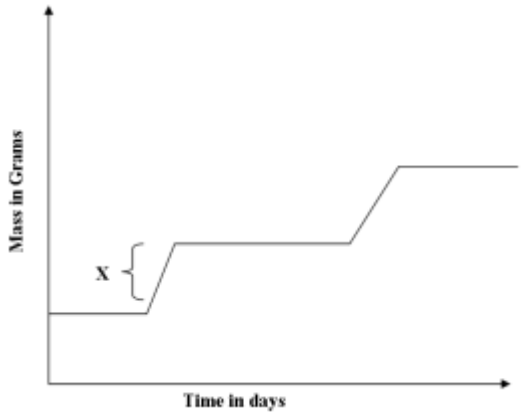
2.The graph below represents the growth pattern of animals in a certain phylum.



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

……..

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

……..

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

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

……..

…….

3 .Name the causative agent of the following diseases in human

(3mks)

i. Amoebic dysentery_____

ii. Bilhazia

_____

iii. Typhoid

_____

4.Give three reasons why plants do not require specialized excretory organs

(3mks)

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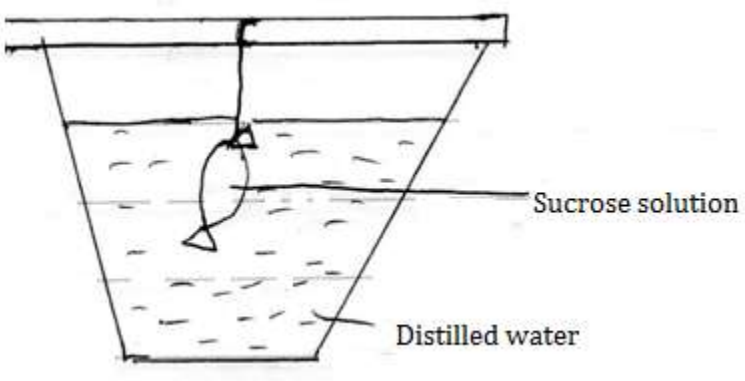
5. An experiment was set up as shown below



The set up was left for 30 minutes.

a. State the expected results

(1mk)

b. Explain your answer in (a) above

(3mks)

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

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

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

Glucose + Fructose Sucrose + Water

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

Process **X** …… (1mk)

Enzyme **R** …….. (1mk)

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

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

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

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9. State the branch of Biology that deals with:
(2 marks)

(a) Study of birds

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(b) Study of the chemical composition of organisms

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.....

10. A certain mammal has no incisors, no canines, 6 molars and 6 premolars on the upper jaw. It has 6 incisors, 2 canines, 6 premolars and 6 molars on the lower jaw.

(a) Write its dental formula
(1 mark)

(b) Suggest with reasons the possible mode of feeding of the animal.
(2 marks)

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11. (a)Some herbaceous plants have very little strengthening tissue yet they remain firm and upright. Give a reason for this observation.
(1 mark)

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(b) Name the strengthening material in the following tissues.
(2 marks)

(i) Collenchyma

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.....

(ii) Xylem vessels

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.....

12. State **two** functions of Aerenchyma tissue in plants.
(2 marks)

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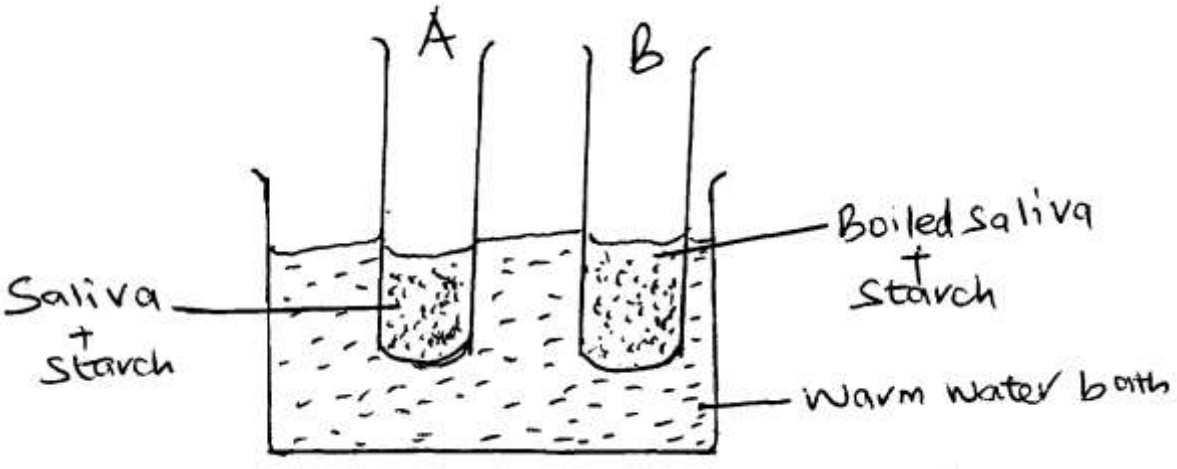
13. A woman gave birth to a child of blood group B+ (B positive). Name two antigens that determined the child's blood group.
(2 marks)

14. In an experiment to investigate an aspect of digestion, two test tubes A and B were set up as shown below.



(a) The test tubes were left in the warm water bath for 30 minutes. The contents of the test tubes were tested for starch using Iodine solution.

State the observations in:
(2 marks)

Test tube A

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Test tube B

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(b) Account for the results in (a) above.
(2 marks)

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B.....
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15 Explain each of the following

a) Variegated plants accumulate less food than non-variegated plants under similar conditions.(1mark

b) Most leaves are thin with broad leaf surface.
(1mark)

c) State **three** importances of photosynthesis in an ecosystem.
(3marks)

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16.Wing of an insect, wing of a bird, hand of a man, flipper of a whale, foreleg of a horse are locomotory structures in animals. Using the structures listed above state the ones considered as

a) Homologous structures

(1mark)

……

……...

b)Identify the type of evolution that brings about homologous structures.

(1mark)

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……..

17. A certain plant was found to have the following features

Parallel venation of leaves

Sheath like petiole

Flower parts in multiple of three

a) Name the class to which the plant belongs.

(1mark)

……

……..

b) Suggest the expected arrangement of vascular bundle in the stem of the plant.

(1mark)

……

……

18. Explain the reason for each of the following in flowering plants

i) Wind pollinated flowers produce large number of pollen grains.

(1mark)

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ii)Insect pollinated flowers have small sticky stigmas that an firmly attached to the style.

(2marks)

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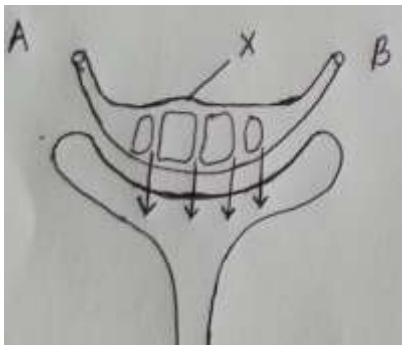
19.The following is part of a kidney nephron,



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

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…

(ii) Name the conditions necessary for the process named in (a)(i) above to take place (2mks)

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b) Name one blood component that a) (i) Name the process represented by the arrows (1mk)

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(ii) Name the conditions necessary for the process named in (a)(i) above to take place (2mks)

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20. a) what is seed dormancy (1mk).

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b) state two ways in which seed dormancy can be broken (2mks)

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

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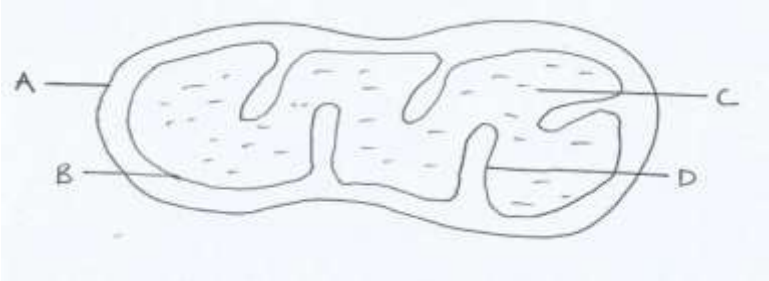
22.Below is a diagram of an organelle that is involved in aerobic respiration.



a) Name the organelle

(1mark)

……

……..

b) Name the parts labeled;

A……

…… (1mark)

B……..(1mark)

C……...(1mark)

c) What is the purpose of the in-foding labeled D?

(1mark)

d) Give the mechanical compound which is formed in the organelle and forms the immediate source of energy

(1mark)

22.State the function of the following parts of a light microscope

a) Clip

(1mark)

……

……

……

b) Eye piece lens

(1mark)

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c) When focusing under high power objective lens the coarse adjustment knob should never be used for focusing. Explain

(2marks)

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23a) Name two defects of the circulatory system in humans.

(2marks)

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b) Explain two protective functions of mammalian blood.

(3marks)……

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POST MOCK 1

Name…… …… Index No:…….

Signature ……..…….

BIOLOGY Date: ……**….**

231/1
Biology
Paper 1
2 hours

INSTRUCTIONS TO CANDIDATES

- *Write your name, Index number and school in the spaces provided above.*
- *Answer All questions in the spaces provided on the question paper.*
- *Sign and write the date of examination in the spaces provided above.*
- *Additional pages must NOT be inserted.*

FOR EXAMINER'S USE ONLY

Question	Maximum Score	Candidate's Score
1-31	80	

This paper consists of 7 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing.

1. What is meant by the term sex linkage. (1mk)

……

2. Part of one strand of DNA molecule was found to have the following sequence

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

What is the sequence

(i) of the complimentary DNA strand? (1mk)

……

(ii) On a m-RNA strand copied from this DNA portion? (1mk)

……

3. State two regions in a plant where the end products of photosynthesis are translocated to? (2mks

……

……

……

4. With reference to circulatory system only give **two** reasons why birds and mammals are more active compared to other organisms?

(2mks)

……

……

5. (a) What **three** characteristics are used to divide the phylum Arthropoda into classes?

(3mks)

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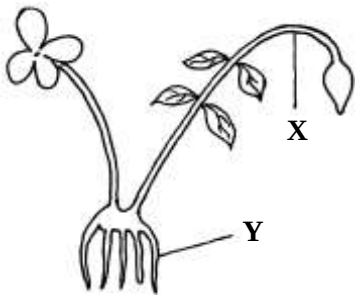
(b) The diagram below shows an organisms from a division in Kingdom plantae. Study it and answer the questions that follow.



(i) Identify the division from which the plant was obtained.
(1mk)

……

(ii) Name the parts labelled **X** and **Y** (2mks)

X……..

Y……

6. What is the relationship between a genus and a species? (1mk)

……

……

7. A drawing of 3 cm was made of a giant spider whose actual length was 7cm. calculate the magnification of the drawing? (3mks)

8. Explain why osmosis is described as a special type of diffusion? (1mk)

……

……

9. The following table shows the estimated number of organisms recorded in a dam.

Organisms	**Number**
Small fish	**3500**
Microscopic algae	**12000**
Crocodiles	**100**
Large fish	**950**
Mosquito larvae	**8900**

(a) Construct a possible food chain for the dam? (1mk)

(b) Construct a pyramid of numbers for the given data? (1mk)

(c) Explain the shape of pyramid obtained? (2mks)

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10. (a) Explain why leaves of most plants are thin and broad. (2mks)

……

……

(b) State the function of the following enzymes during digestion in the stomach?

(i) Pepsin (1mk)

……

(ii)Renin (1mk)

……

11. Explain the following:

(i) Respiratory surface must be moist? (1mk)

……

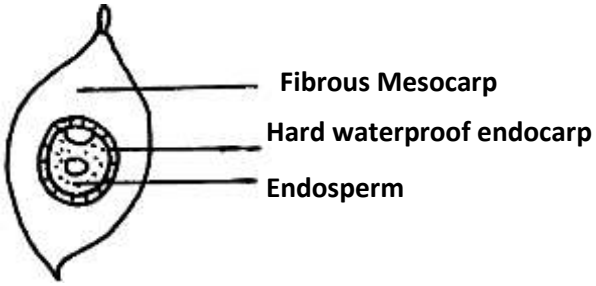
(ii) Respiratory surface must be thin (1mk)

……

(iii) Palisade cells are cylindrical shaped and arranged with long axis perpendicular to the leaf surface. (1mk)

…….

12.The diagram below represents the vertical section of a fruit.



(a) Suggest the possible agent of dispersal of this fruit. (1mk)

……

……

(b) Explain **two** observable features that adapt the fruit to its mode of dispersal. (2 mks)

……

……

13.Explain why the body temperature of a healthy person rises slightly during humid days? (2mks)

……..

..……

14(a) (i) Name the respiratory surface in insects. (1mk)

……

(ii)State any **one** feature that adapts the structure named in a(i) above to its function. (1mk)……

(b) Why are the fish gills highly vascularized? (1mk)

……

……

15State the function of the following organelles:

(i) Granulated Endoplasmic reticulum (1mk)

……

(ii) Nucleolus (1mk)

……

16 State **two** gaseous exchange sites in plants? (2mks)

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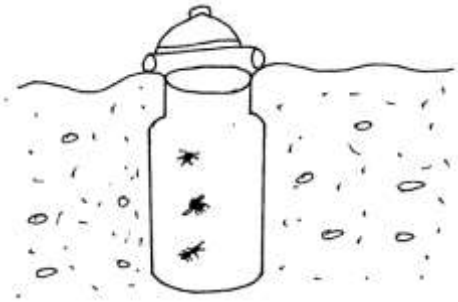
17 The diagram below shows an apparatus used during collection of specimen in biological study.



(a) Identify the apparatus? (1mk)

……

(b) What is the use of the apparatus named above? (1mk)

……

18 List **three** limitations of fossil records as an evidence of organic evolution? (3mks)

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……

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19 Distinguish between enzyme co-factors and co-enzymes? (2mks)

……

……

20 Give **two** reasons for the rapid growth during the exponential phase of growth curve? (2mks)

……

……

……

21 Give **two** reasons why *Carolus Linneaus* preferred the use of latin language in the scientific naming of living organisms. (2mks)

……

……

22 State **three** roles played by active transport in living organisms. (3mks)

……

……

……

23 List **three** factors affecting the rate of respiration?

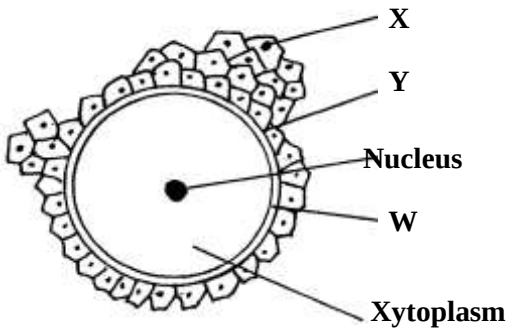
(3mks)

……

……

……

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



(a) Identify the cell (1mk)

……

……

……

(b) Label the parts **X,Y** and **W** (3mks)

X……

Y……

W……

25 Explain why it is becoming more difficult to treat malaria using chloroquine? (2mks)

……

……

……

……

26 State **two** ways by which the ileum is adapted for absorption of food materials? (2mks)

……

……

……

27 Name **two** processes that contribute to variation during gamete formation? (2mks)……

……

……

28.Damage to the mammalian liver may lead to indigestion of fats. Explain this observation. (2 mks)

…….

…….

29.Name the disease of blood characterized by

i) Abnormally large number of white blood cells. (1 mk)

……

ii) Cresent-shaped haemoglobin instead of the normal biconcave shape. (1 mk)

……

30. During a strenuous exercise the chemical process represented by the equation below takes place in the human muscle cells.

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

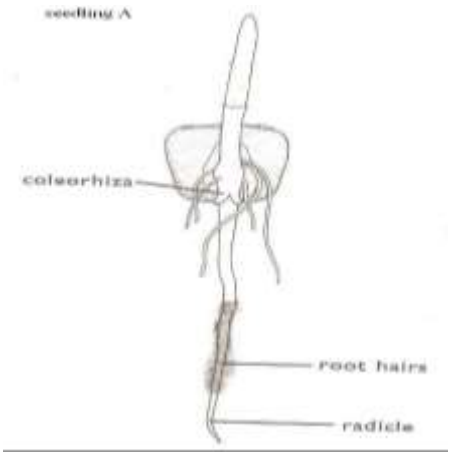
(Substance X)

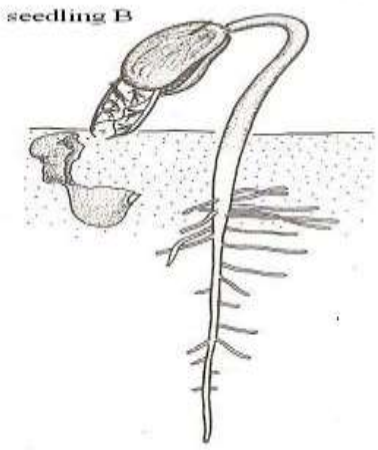
a) Name the process represented above . (1 mk)

……

b)Name substance X …….....
(1mk)

31. The diagram below represents a stage of growth in two different seeds.


seedling A
coleorhiza
root hairs
radicle


seedling B

[a] Identify the type of germination exhibited by seedlings A and B. [2 marks]

Seedling A……

Seedling B……

[b] State the role of oxygen during germination. [1 mark]

……

……..

[c] Account for the loss of weight in cotyledons in germinating seeds. [1 mark]

……

……

[d] (i) State the role of juvenile hormone during metamorphosis in insects. [1 mark]

……

……..

(ii) Name the glands that secrete juvenile hormone [1mark]

……..