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

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

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

231/1

BIOLOGY

PAPER 1

DECEMBER 2020

TIME: 2 HOURS

SUKELLEMO JET

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

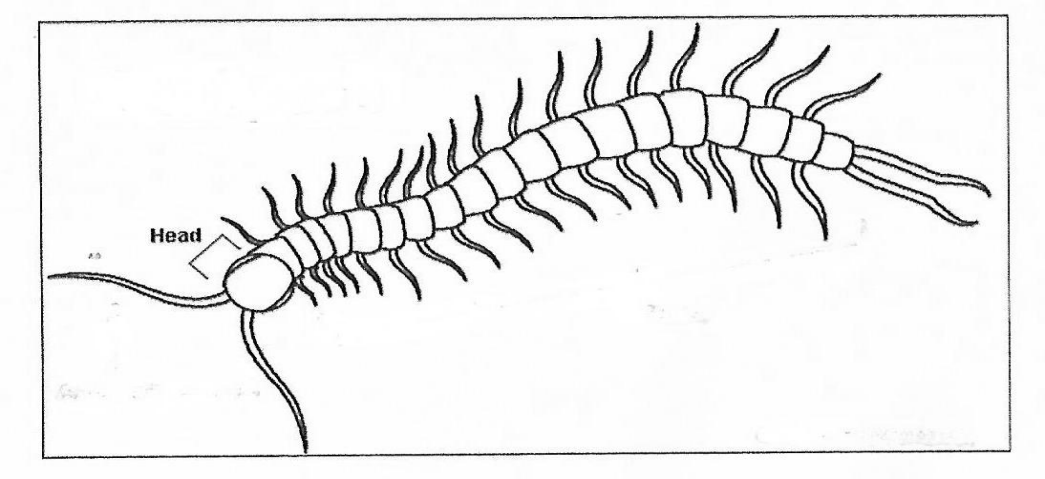
   (a) Study of cockroaches, housefly and locusts. (1 mark)

   .....

   (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)

   .....

   .....

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)

   .....

   .....

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

   .....

   .....

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

.....

.....

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

.....

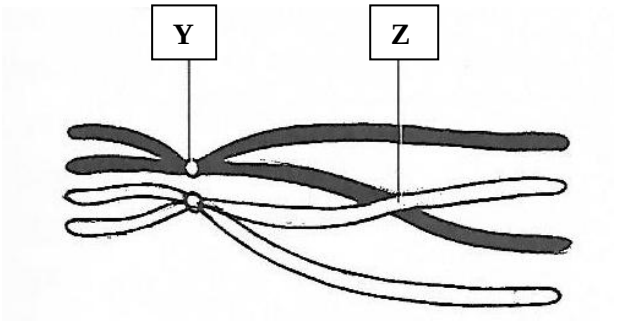
4. Under certain conditions, the carbon(IV) oxide concentration in the blood of a mammal rises above normal level. State two physiological changes that occur in the body to lower the carbon(IV) oxide back to normal. (2 marks)

.....

.....

.....

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)

.....

.....

.....

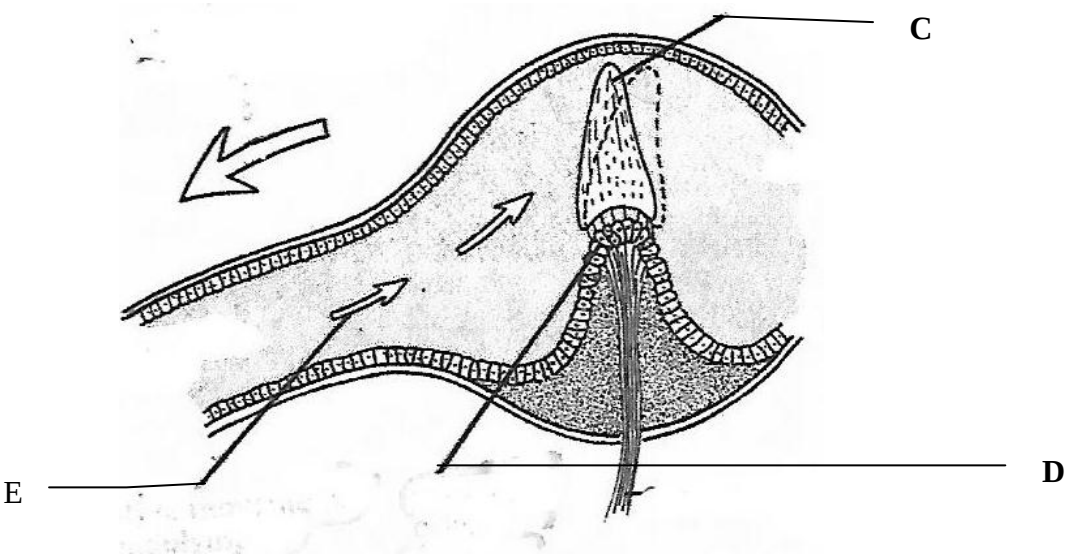
(b) Which cell division does the above phenomenon occur? (1 mark)

.....

(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)

.....

.....

.....

.....

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)

.....

.....

.....

.....

(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)

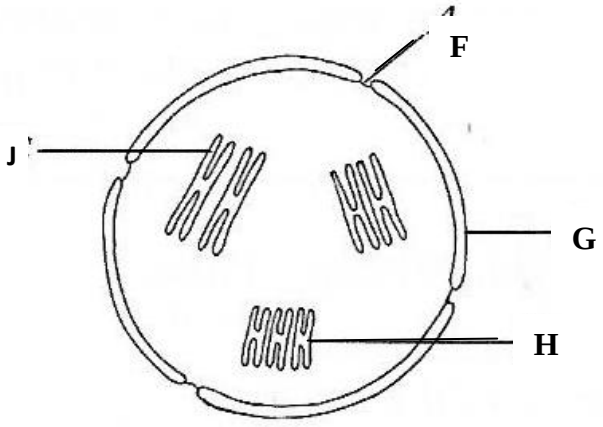
.....

(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)

.....

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

.....

.....

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

.....

.....

.....

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)

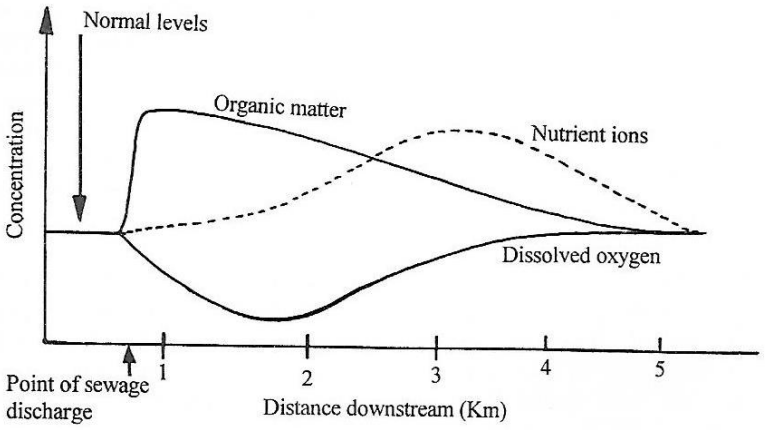
.....

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

.....

.....

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)

.....

.....

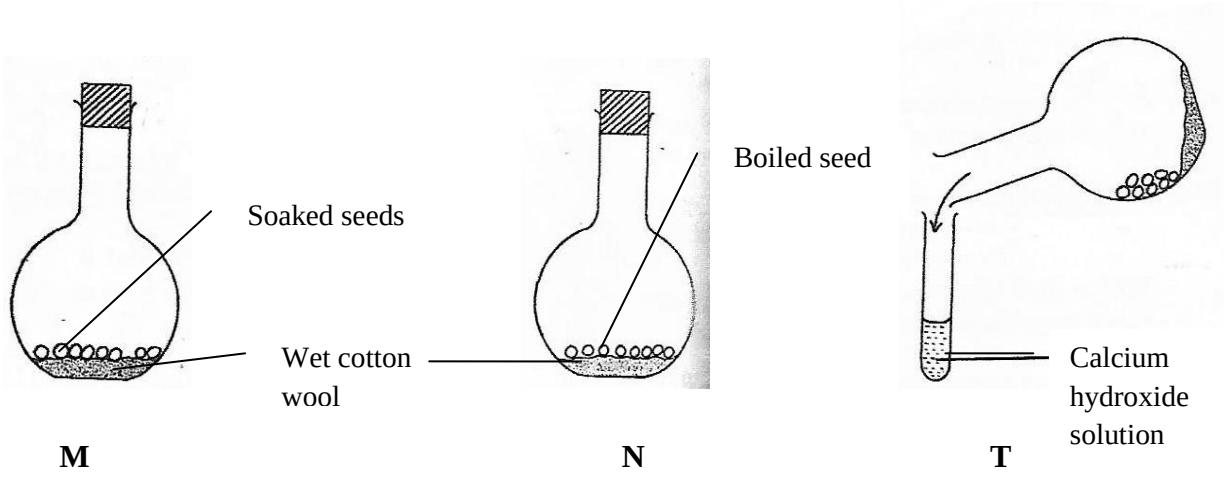
(ii) Water plants and photosynthetic algae about one and half kilometres downstream from the point of sewage discharge. (1 mark)

.....

.....

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)

.....

.....

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

M

.....

.....

N

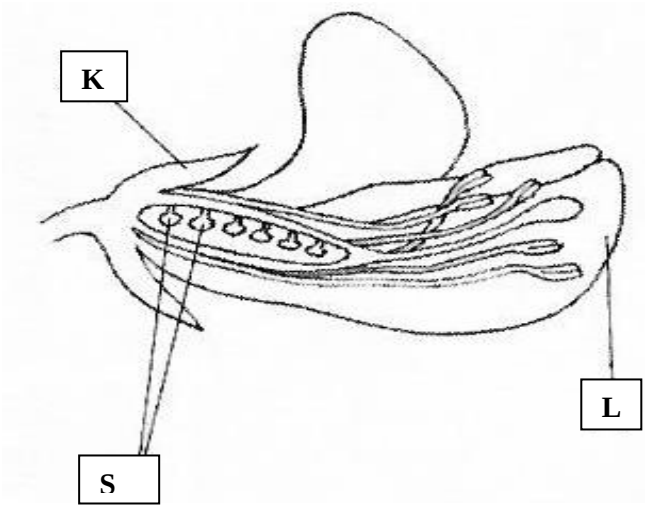
.....

.....

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

.....

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)

.....

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

.....

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

.....

.....

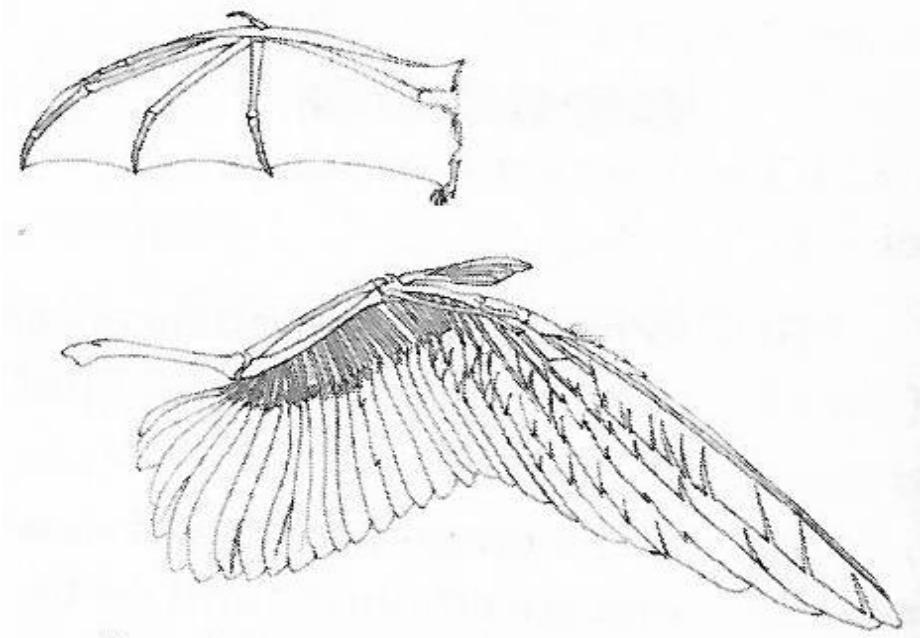
.....

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

.....

.....

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)

.....

.....

.....

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

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

.....

.....

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

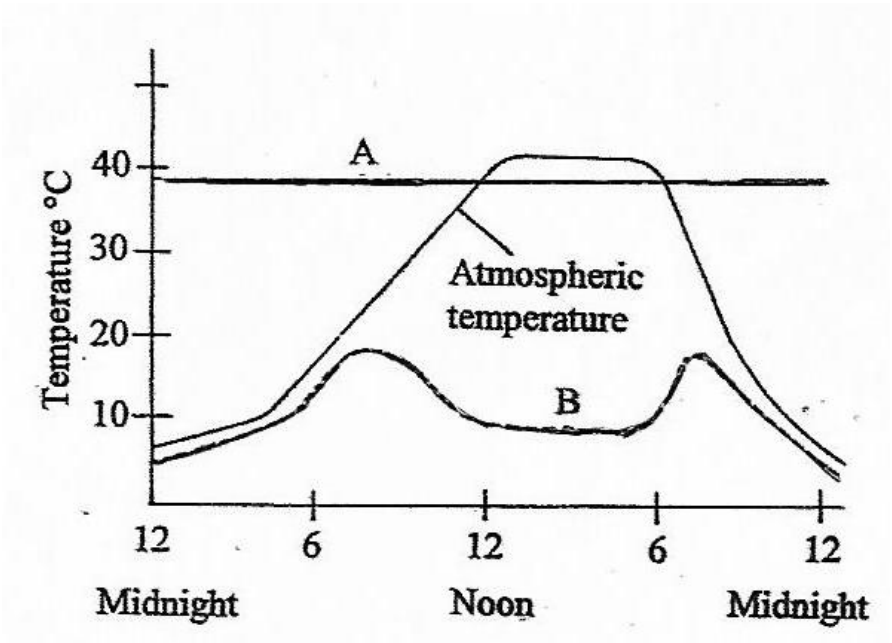
.....

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

.....

.....

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)

.....

.....

.....

.....

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

.....

.....

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

.....

.....

.....

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

.....

.....

.....