

231/2

BIOLOGY PAPER 2

(Theory)

Time: 2 Hours

STRATHMORE HIGH SCHOOL MOCK EXAM

INSTRUCTIONS

Write your name, index number and class in the spaces provided.

This paper consists of 2 sections: A and B

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

In section B answer question 6 (compulsory) and either question 7 or 8 in the foolscaps provided.

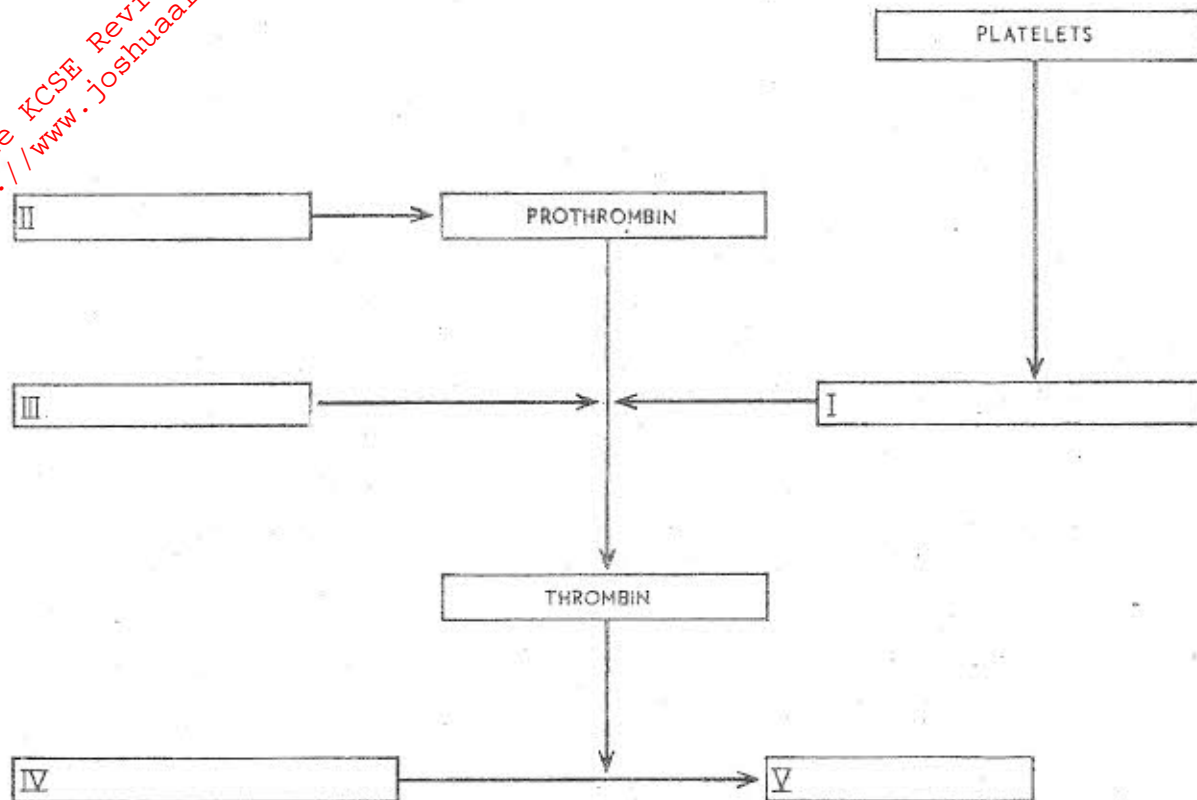
For Examiner's Use only

Question	Maximum Score	Candidate's Score
1	8	
2	8	
3	8	
4	8	
5	8	
6	20	
7	20	
8	20	
	80	

This examination paper consists of 8 printed pages to which two foolscaps have been attached. Candidates should check the question paper to ensure that all the pages are printed as indicated and no questions are missing.

SECTION A (40 marks)

1. The schematic diagram below illustrates the mechanism of an important physiological process in humans. Use it to answer the questions that follow.

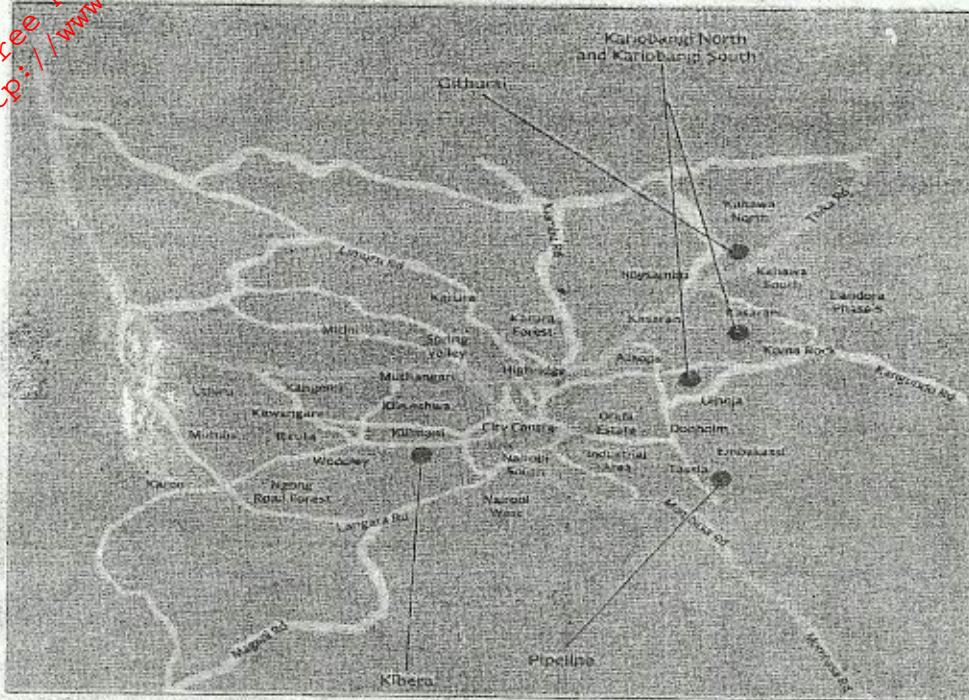


- Fill the numbered boxes with names of the correct chemical substances. (2.5 marks)
- To facilitate the process one is normally strongly advised to have leafy green vegetables in one's regular diet. Give a reason for this. (1 mark)
- Suggest how this process contributes to homeostasis. (2 marks)
- State the role of the liver in the process. (1 mark)
- Give three structural differences between platelets and erythrocytes (1.5 marks)

2. Read through the newspaper excerpt below and answer the ensuing questions.

DAILY NATION
Thursday June 11, 2009

DISEASE HOT SPOTS



A map of Nairobi showing areas that have been hit by cholera.

Eight cholera cases reported in Nairobi

By ARTHUR OKWEMBA

Cholera has finally hit Nairobi with at least eight cases being reported at Kenyatta National Hospital. Two patients have already died from the disease.

Most of the patients seem to have been infected in Western and Nyanza provinces after travelling to Busia, Bungoma and Kisumu districts, which have reported cholera outbreaks.

They arrived in Nairobi when the disease was in its incubation period, only to fall sick after few days

later. Five cases were reported in May and the rest this month.

The two who died arrived at the hospital when it was too late to save their lives.

Hospital records

According to records at KNH, Ongata Rongai leads with the numbers of cases that have been reported.

Kibera, Kariobangi South, Githurai and Pipeline are some of the estates where some of the patients reside, says Simon Ithae, the hospital's public relations manager.

In Kibera, a woman who sells fish had travelled to Kisumu to bring in fresh supplies, only to come back with cholera.

In Kariobangi South, the affected woman patient sells githeri on the roadside.

The two cases have sent panic among the public health officials since the female patients could easily spread the disease to their clients.

The cholera outbreak comes at time when the city is experiencing water rationing, which will last up to the end of this year.

(a)(i) What is meant by the term "incubation period"?

(1 mark)

(ii) State the average incubation period for cholera (1 mark)

(b) From the foregoing excerpt it is stated that two of the cholera victims who died at Kenyatta National Hospital were admitted when it was too late to save their lives.

(i) Explain the most probable condition that could have accelerated the deaths of the victims.

(2 marks)

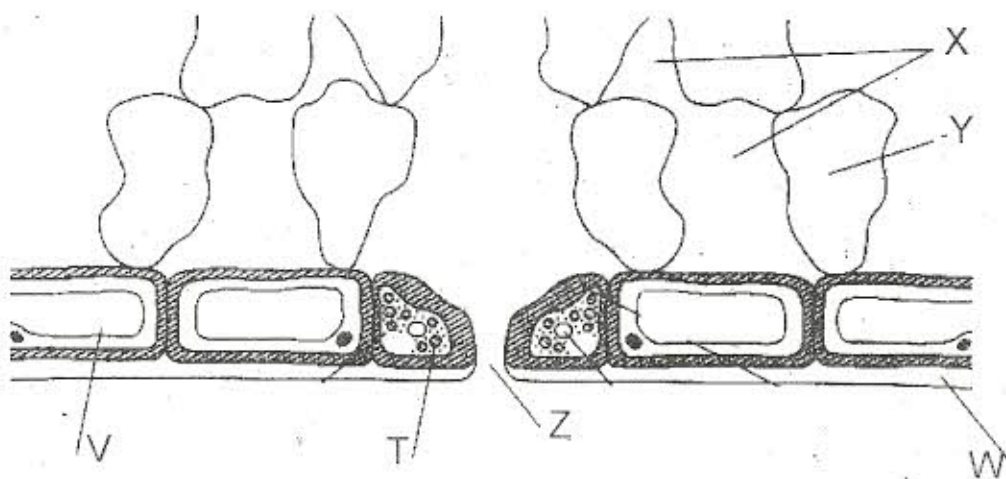
(ii) Suggest an immediate home-based "First-Aid" therapy you would administer to a cholera victim to remedy the condition explained in (b)(i) above.

(1 mark)

(c) As a Public Health Official what advice would you offer to healthy residents of Kibera and Kariobangi South to prevent further spread of the disease?

(3 marks)

3. The diagram below represents a lower section of the internal structure of the leaf of a mesophyte. Study it and answer the subsequent questions.



(a) State two structural differences between the cells labeled T and V.

(2 marks)

(b) State the functional difference between the parts labeled X and Z.

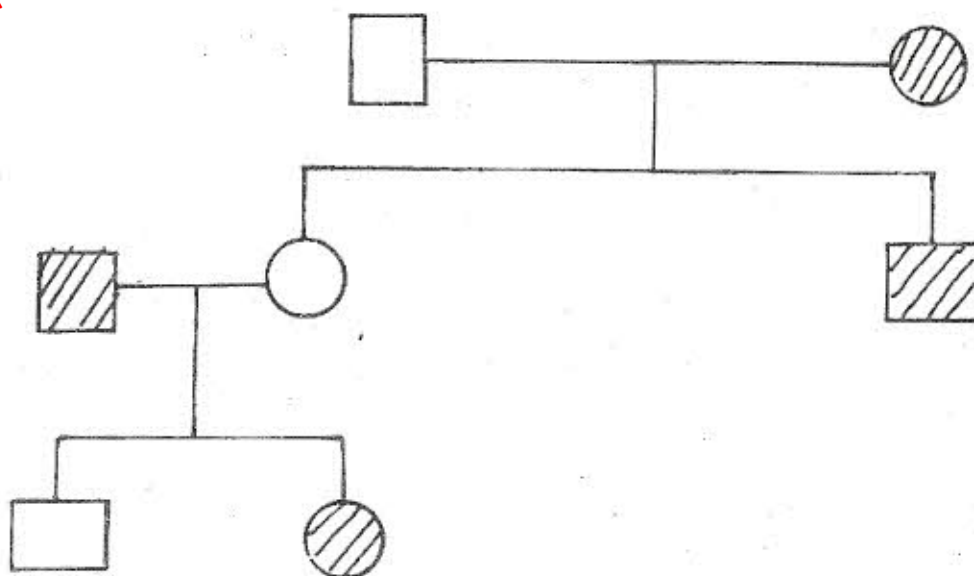
(2 marks)

(c) How are structures W and Y adapted to facilitate gaseous exchange in the mesophyte?

(4 marks)

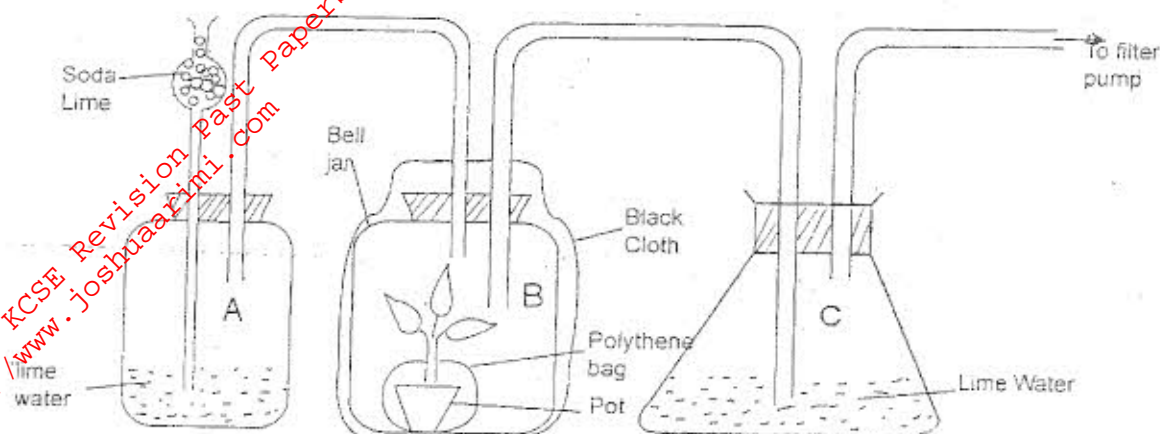
4. In the following human pedigree chart, squares symbolize males and circles symbolize females. Let us assume that the stripes represent individuals with two toes in their feet, a result of some mutation. The gene for the two-toed condition is sex-linked and is typically symbolized "t" since it is recessive to the gene for the normal five-toed condition.

(a)(i) Using the appropriate symbols show how the two-toed grand-daughter of the parental



- (ii) What is the probability that the two-toed grand-daughter could have a normal five-toed sister? (1 mark)
- (b) State why a two-toed male cannot transmit the gene for this condition to the son. (1 mark)
- (c) The two-toed female parent in this pedigree chart was from a pure-breeding line. What does this mean? (1 mark)
- (d)(i) State a chromosomal mutation which is of beneficial value. (1 mark)
- (ii) How is the mutation mentioned in (d)(i) above beneficial? (1 mark)

5. The diagram below illustrates an experiment to demonstrate a certain physiological process.



a) What is the aim of the above experiment? (1 mark)

b) State the role of soda lime. (1 mark)

c) What observations were made in
i) vessel A? (1 mark)

ii) vessel C? (1 mark)

d) Why is it necessary to enclose the pot with a polythene bag? (2 marks)

e) Explain the role of the black cloth covering the bell jar. (2 marks)

SECTION B (40 marks)

6. A farmer wanted to plant some Acacia trees in his garden. Initially the seeds took very long before germinating. To overcome this delay, he put the seeds in hot water at 45°C. Batches of 20 seeds were removed at one minute intervals and then planted in different nurseries where they were well watered. After 14 days he counted the number of seedlings in each nursery and recorded the results as shown in the table below.

Batch of Acacia seeds	Time intervals (minutes)	Germinated seeds	Percentage germination
1 st	0	4	
2 nd	1	4	
3 rd	2	10	
4 th	3	17	
5 th	4	20	
6 th	5	15	
7 th	6	12	
8 th	7	8	
9 th	8	4	
10 th	9	0	

- (a) Calculate the percentage germination for each batch of seeds and record it in the last column in the table above. (5 marks)
- (b) Use the results of your calculation in (a) above to plot the graph of percentage germination
- (c) From the graph determine:
- (i) the percentage germination if the seeds were soaked for 5.5 minutes? (1 mark)
- (ii) the time the seeds would take to achieve 80% germination (1 mark)
- (d) Account for the failure of the 10th batch of Acacia seed to germinate. (2 marks)

(e)(i) Why do you think the seeds did not germinate before being soaked?

(1 mark)

(ii) Besides hot water treatment, what other method could be used to induce the initial germination

(f) Account for the expected results if the temperature of the water was

(i) raised to 1000C.

(2 marks)

(ii) lowered to 50C.

(2 marks)

7. Describe how gaseous exchange occurs in

(a) a named terrestrial insect.

(9 marks)

(b) the Tilapia.

(11 marks)

8. How are fruits and seeds suited to their modes of dispersal?

(20 marks)