NAME..... CLASS..... ADM NO.....

DATE..... SIGN.....

231/2

BIOLOGY PAPER 2

THEORY

September 2022

TIME: 2 HOURS

ALLIANCE HIGH SCHOOL EXAMS

STRONG TO SERVE

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

INSTRUCTIN TO CANDIDATES

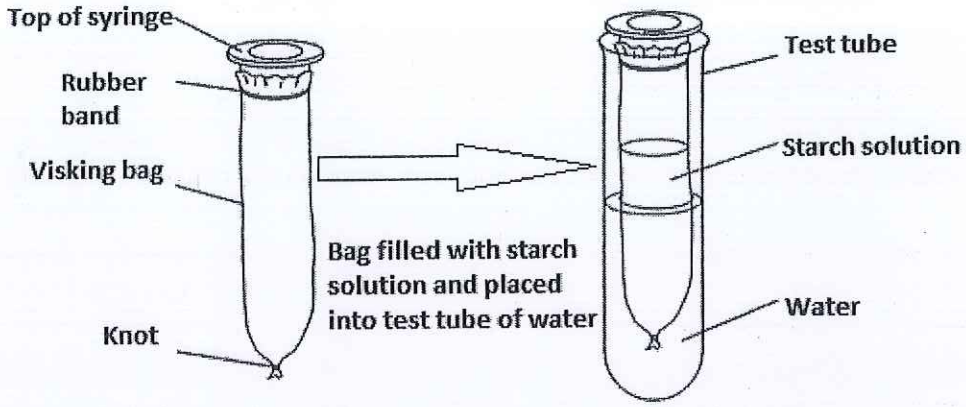
a) Write your name and index number in the spaces provided above
b) Sign and write the date of examination in the spaces provided above.
c) This paper consists of two sections A and B.
d) Answer all the questions in Section A in the spaces provided
e) In section B answer questions 6 (compulsory) and either question 7 or 8 in the spaces. provided.

For examiner's use only

Questions	Maximum score	Candidate score
Section A	40	
Section B	20	
Section C	20	
TOTAL	**80**	

SECTION A (40MKS)

1. A student set up an experiment using a visking bag as shown



The student added some iodine solution to the water in the test-tube. After 30 minutes at room temperature, the contents of the visking bag were stained blue-black, but the water outside remained a yellow colour.

(a) Explain these results. (4mks)

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(b) State factors that influence the movement of molecules through visking bag (3mks)

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(c) Describe the effect of increased carbon(iv) oxide concentration on blood pH.(1mk)

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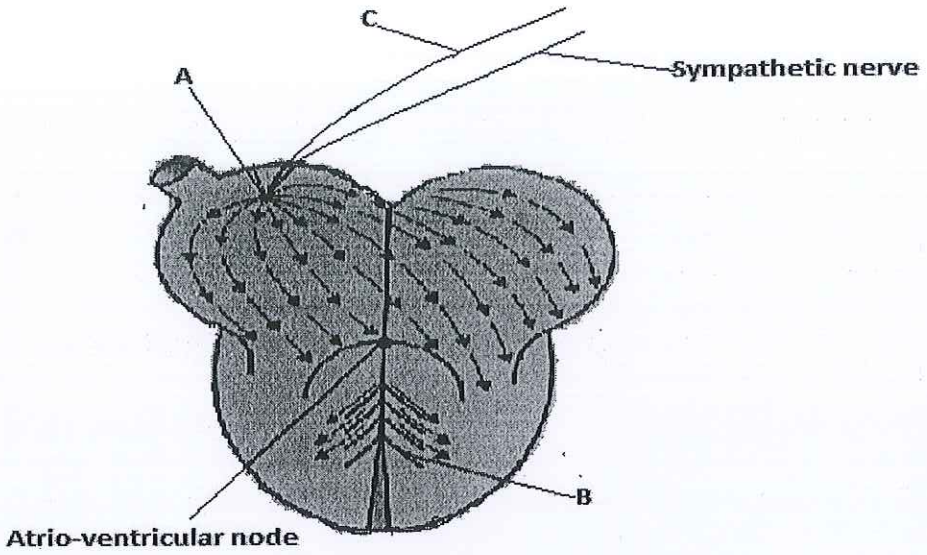
2. Use the diagram below to answer the questions that follow.



(a) (i) Name the parts labelled **A, B** and **C.**
(3mks)

A.....

B.....

C.....

(b) State the function of the part labelled **C.** (1mk)

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(c) What is the difference between pulmonary circulation and systemic circulation.
(2mks)

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(d) What is the advantage of having a double circulatory system over a single circulatory system? (2mks)

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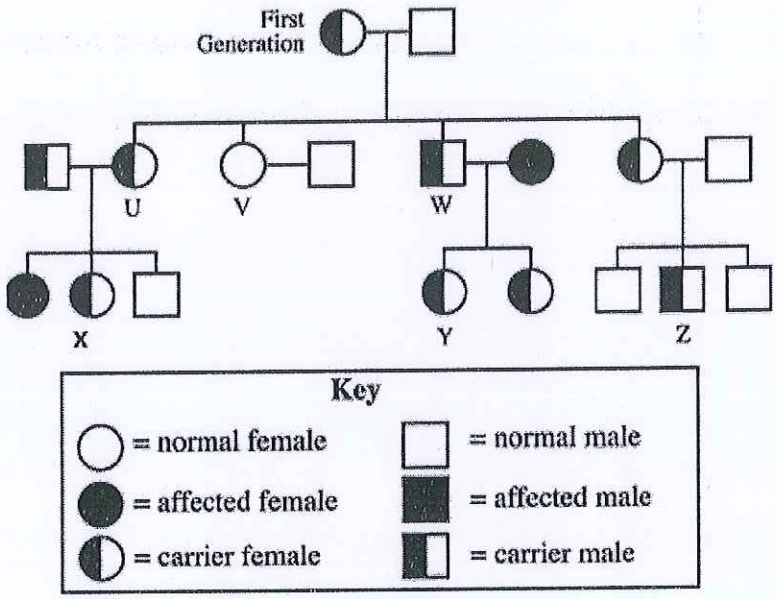
3. Study the sickle cell pedigree below and answer the questions that follow.



Given that the allele for normal haemoglobin is expressed as Hb^A while the allele for abnormal haemoglobin is Hb^S

(b) Complete the genetic diagram of marriage of two X and Z (4mks)

c) What is the probability of having a sickle cell child (2mks)

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d) Describe the effects of sickle cell anaemia on the body (2mks)

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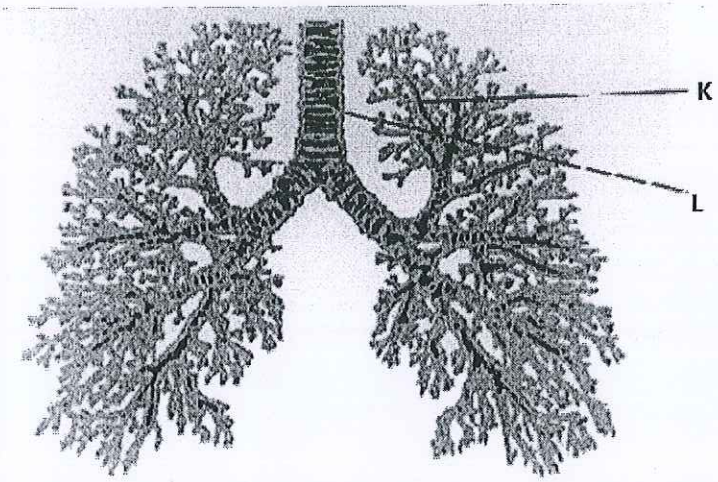
4. The figure below shows the human gas exchange system.



(a) Name structures K and L. (2mks)

K.....

L.....

(b) Explain how structure L is adapted to its function (3mks)

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(c) Tobacco smoke affects the gas exchange system. Name one components of tobacco smoke and describe their effect on the gas exchange system. (2mks)

Component.....

effect.....

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(d) Name the part of the blood in which most carbon (IV)oxide is transported. (1mk)

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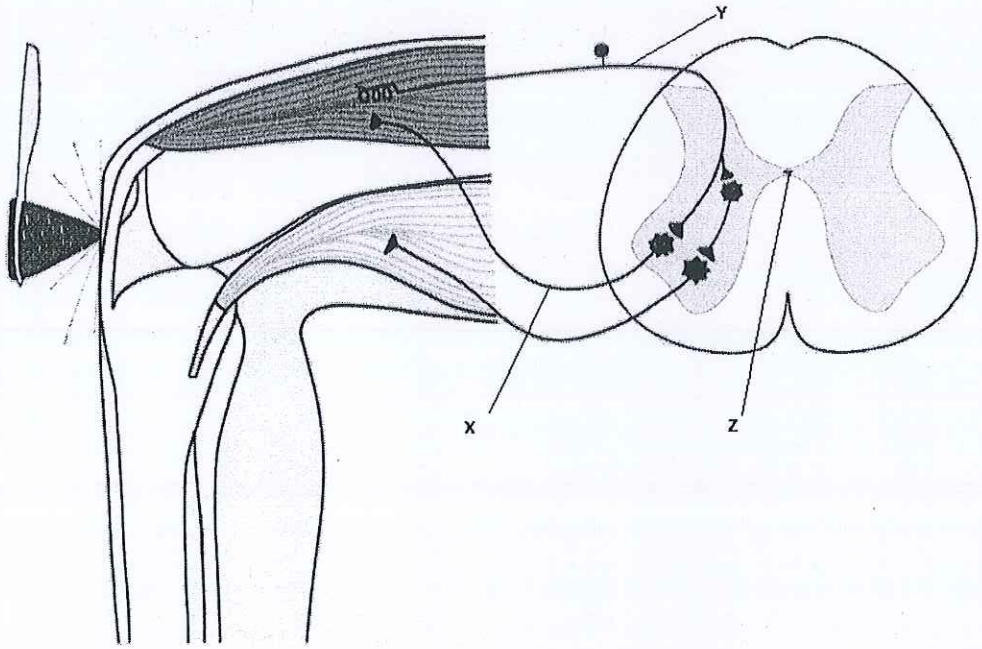
5. The diagram below illustrates the components of a simple reflex that takes place when during a knee jerk



(a) Name the neurones labelled **X** and **Y**. (2mks)

X.....

Y.....

(c) State **one** function of the fluid found in the part labelled **Z**. (1mk)

(c) Explain how the above simple reflex action takes place. (5mks)

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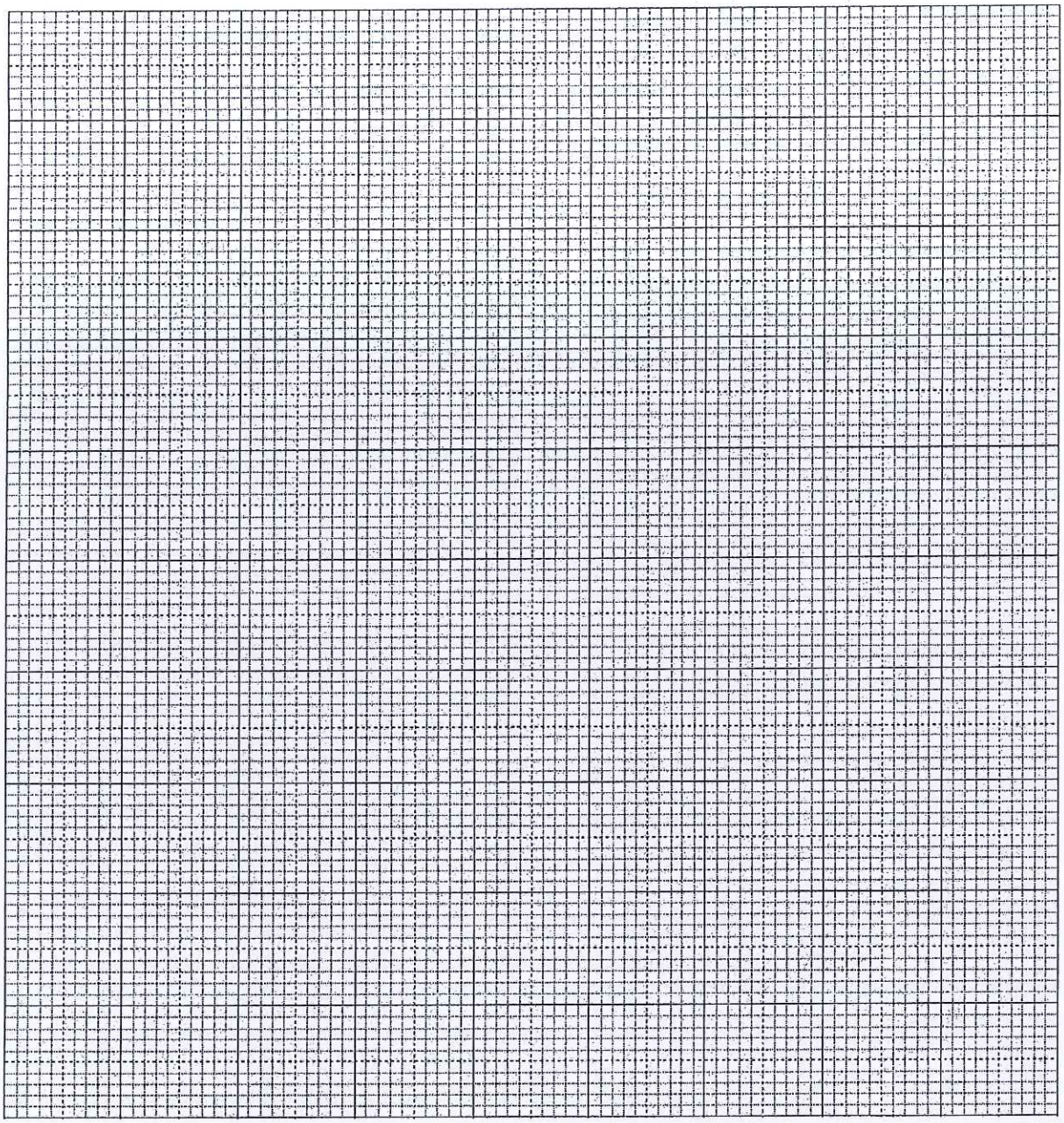
SECTON B (40 MKS)

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

6. A student grew two separate cultures of single celled organisms. One culture contained *Paramecium caudatum* and the other contained *Paramecium aurelia*. The cultures were grown under the same condition and the number of paramecia (per drop) in each culture was estimated every two days for a period of 16 days. The results are shown in the table below

No. of days		0	2	4	6	8	10	12	14	16
No. of Paramecia present (per drop)	*T. caudatum*	4	10	30	48	58	62	60	61	60
	T. aurelia	4	10	46	66	70	69	71	71	71

(a) Using the same axis, draw graphs of number of paramecia in the culture against time. (8mks)



(b) How many paramecia were present on the 7th day? (2mks)

P. caudatum.....

P. aurelia.....

(c) Account for the change in the two populations between day 0 and 8. (4mks)

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(d) (i) What happens to *P. caudatum* between day 10 and 16? (1mk)

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(ii) What biological phenomenon is represented by observation in (d) (i) above? (1mk)

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(e) State any four biological factors that regulate population growth of animals in their habitat. (4mks)

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7. (a) Explain how a bony fish is adapted to swim ? (15mks)

(b) State five functions of an insects exoskeleton. (5mks)

8. (a) Explain the economic importance of fungi (10mks)

(b) Describe various ways of breaking seed dormancy (10mks)

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