

NAME:.....

INDEX NO:.....

SCHOOL:.....

DATE:.....

SIGN:.....

231/2

**BIOLOGY**

**PAPER 2**

**(THEORY)**

**NOV/DEC. 2021**

**TIME: 2 HOURS**

**MOMALICHE 2021 SECOND TERM EXAMINATIONS**

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

**INSTRUCTIONS TO CANDIDATES**

1. Write your name and index number in the spaces provided above.
2. Sign and write the date of examination in the spaces provided above.
3. This paper consists of **Two** sections **A** and **B**.
4. Answer **ALL** the questions in section **A** in the spaces provided.
5. In section **B** answer question 6 (compulsory) and either 7 or 8 in the spaces provided.

**FOR EXAMINERS USE ONLY.**

SECTION	QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
B	6	20	
	7	20	
	8	20	
	<b>TOTAL</b>	<b>80</b>	

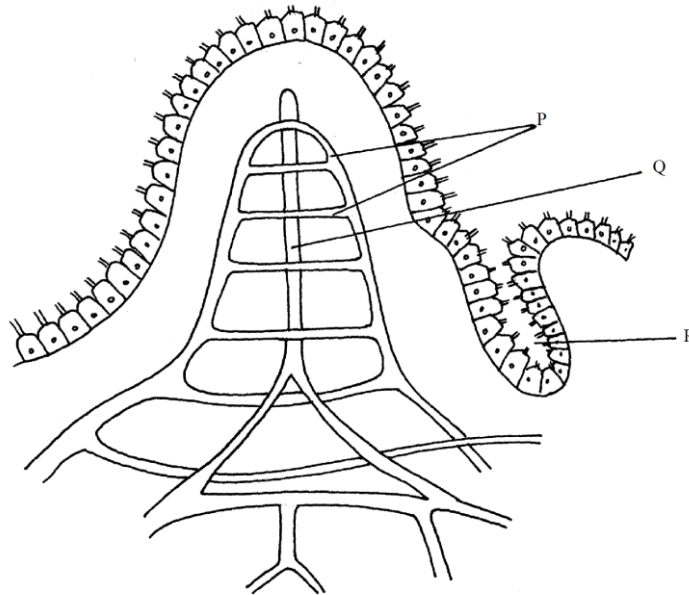
*This paper consists of 14 printed pages.*

*Candidates should check the question paper to ensure that all pages are printed as indicated and that no questions are missing.*

**SECTION A (40 MARKS)**

**Answer all the questions in the spaces provided.**

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



- (a) Identify the structure (1mks)

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- (b) State the role of the part labelled R (1mk)

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- c) A student took a meal of lean meat. Briefly describe the digestion of the food substance where this structure is found (3mks)

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- (d) What is the role of the following: *enterokinase* and *cholecystokinin* in digestion? (2mk)

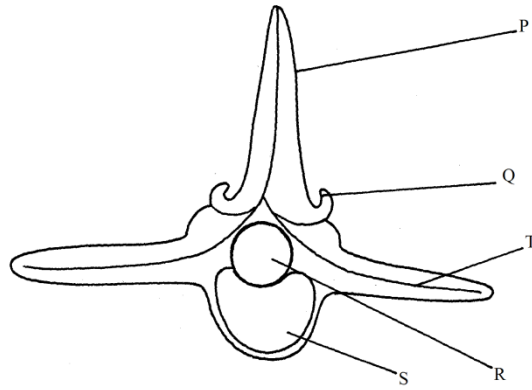
Enterokinase.....  
.....

cholecystokinin:.....  
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- e) State the deficiency disease associated with lack of vitamin **B<sub>2</sub>** (1mk)

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2. (a) The diagram below represents the anterior view of a certain mammalian vertebra



(ii) Name the part labelled Q (1mk)

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ii) Describe **three** adaptations of the above vertebra to its function (3mks)

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b) State the role of the part of the brain called **Medulla oblongata** (1mk)

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c) State the effects of under secretion of **thyroxine hormone** (hypothyroidism) (2mks)

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3.(a) Define the following terms as applied in genetics

(i) Genetic engineering (1mk)

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(ii) Biotechnology (1mk)

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(b) In a family of four children, the father had blood group A while the mother had blood group B. One of the children had blood group O. The father wanted to commit suicide accusing his wife of infidelity?

i) Was this accusation justified? (1mk)

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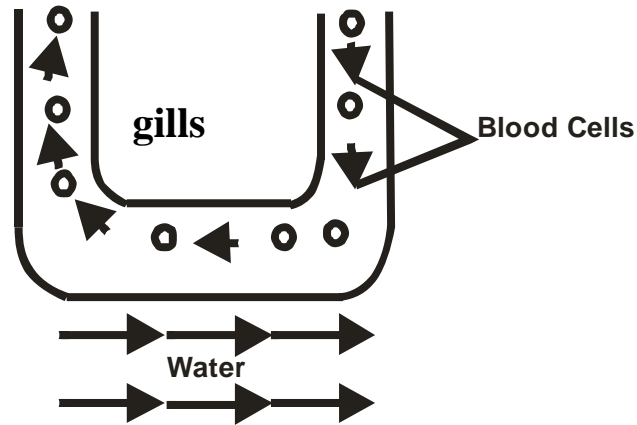
ii) With the use of a punnet square work out the genotype of other children. (3mks)

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c) Explain why haemolytic disease of the new born (Erythroblastosis foetalis) is encountered in children born later in a family where the mother is Rhesus negative and the father is Rhesus positive (2mks)

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4. The diagram below shows how gaseous exchange occurs across the gills in fish.



(a) Explain the advantage of the above flow named in a(i) above. (1 Mk)

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(b) If the fish is removed from water it dies immediately. Explain why (2mks)

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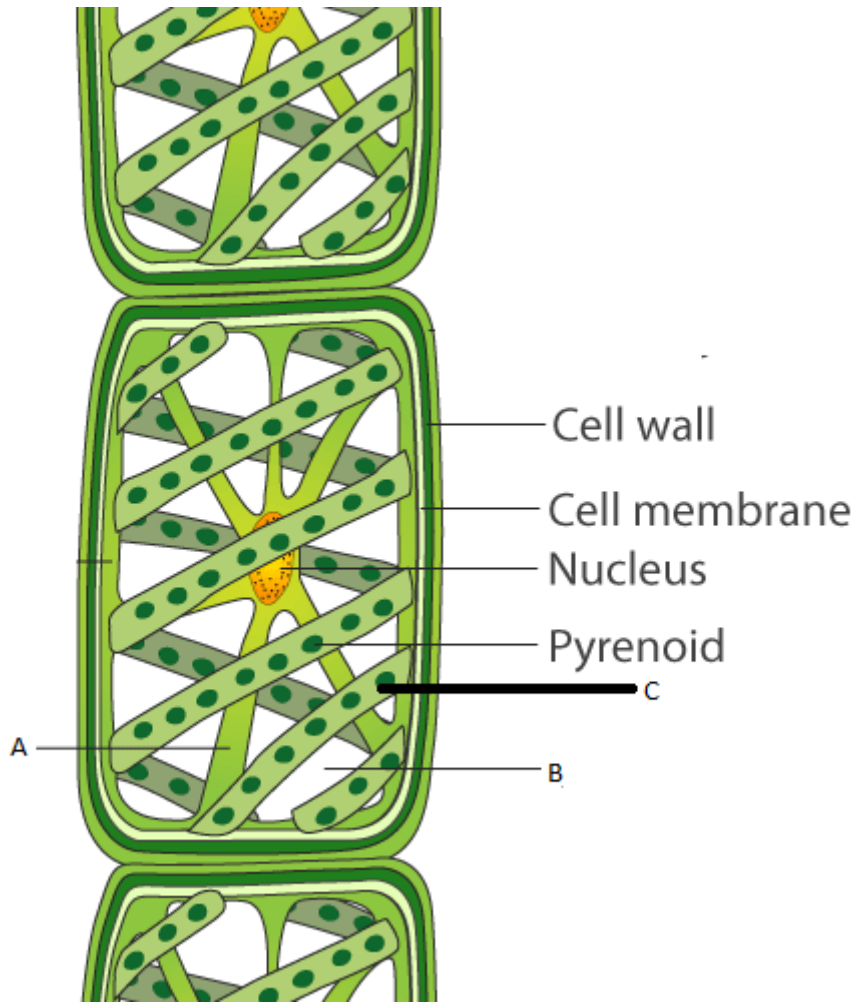
c) Explain mechanism of gaseous exchange in frog through the skin (5mks)

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d). In mammals haemoglobin is confined to red blood cells. Give one advantage of this (1mk)

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5. The diagram below show the structure of an organism. Study it and answer the questions that follows.



a) i) Name the parts labelled and A and B (2mks)

A: .....

B : .....

ii) State the role of part labeled C (1mk)

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 .....

b) State the kingdom to which the organism belong (1mk)

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c) State the economic Importance of the organism in this Kingdom (1mks)

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d) i) state the causative agent of syphilis (1mk)

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 .....

ii) State one of the symptoms of the disease

(1mk)

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iii) State the role of sertoli cells in reproduction

(1mk)

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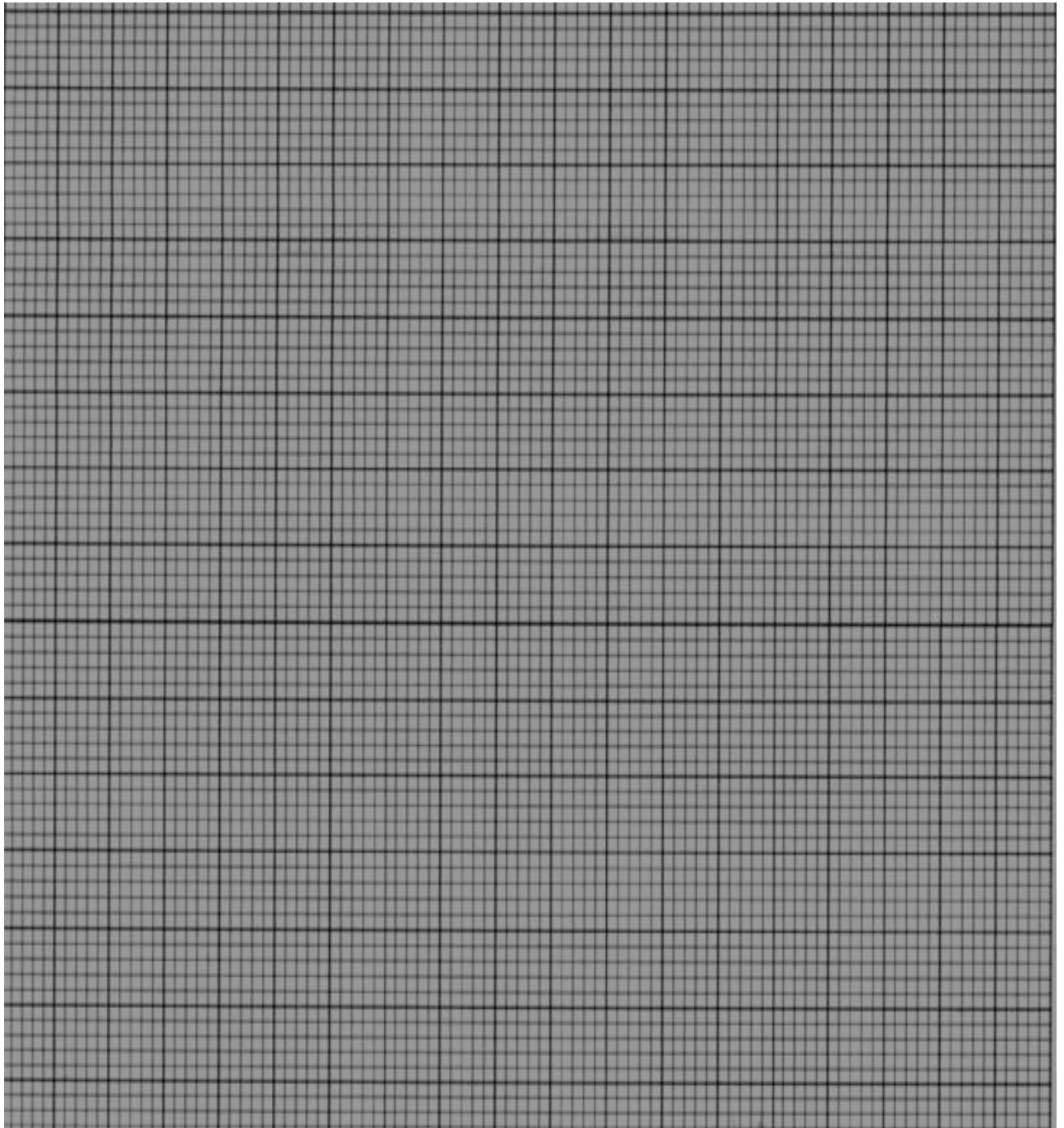
**SECTION B (40 MARKS)**

**Answer question 6(compulsory) and either question 7 or 8**

6. The data below was obtained during ecological study in grassland

<b>organism</b>	<b>Dry mass mg/m<sup>3</sup></b>
Primary producers	1600
Primary consumers	400
Secondary consumers	120
Tertiary consumers	8

(a) Using the same grid provided draw a pyramid of biomass for the data above (6mks)





b) Account for the shape of the pyramid of biomass (4mks)

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c) i) Explain why pyramid of numbers on data obtained from a forest ecosystem differs from the data above (2mks)

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ii) state on importance of ecological pyramids (1mk)

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d) Describe how you would use 1m<sup>2</sup> quadrat to investigate changes in frequency of the grass population over a period of five years (4mks)

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e) In what form will you present your results in (d) above ? (1mk)

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f) State any two limitations of using quadrat to study populations (2mks)

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g) Name the instrument that is used to measure light penetration in water (1mk)

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