

THE UNITED REPUBLIC OF TANZANIA  
NATIONAL EXAMINATIONS COUNCIL  
ADVANCED CERTIFICATE OF SECONDARY EDUCATION EXAMINATION  
MAY 1998

133/2

BIOLOGY PAPER 2  
(For both School and Private Candidates)

TIME : 2½ Hours.

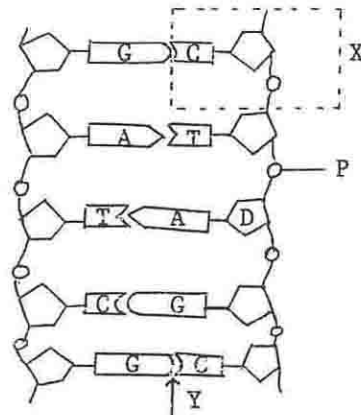
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INSTRUCTIONS

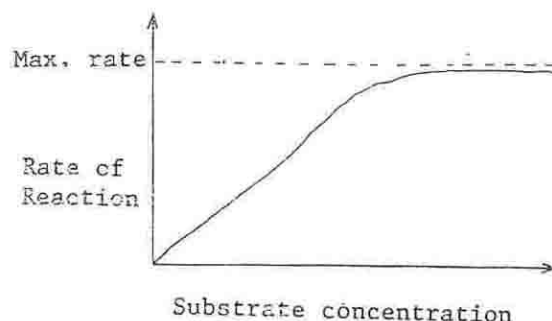
1. Answer ALL questions.
2. Write your centre and index number on every page of your answer book provided.
3. Except for diagrams, which must be drawn in pencil, all writing must be in blue or black ink/ball point pen.
4. Read each question carefully.
5. The mark allocation is indicated at the end of each question.

This paper consists of 4 printed pages.

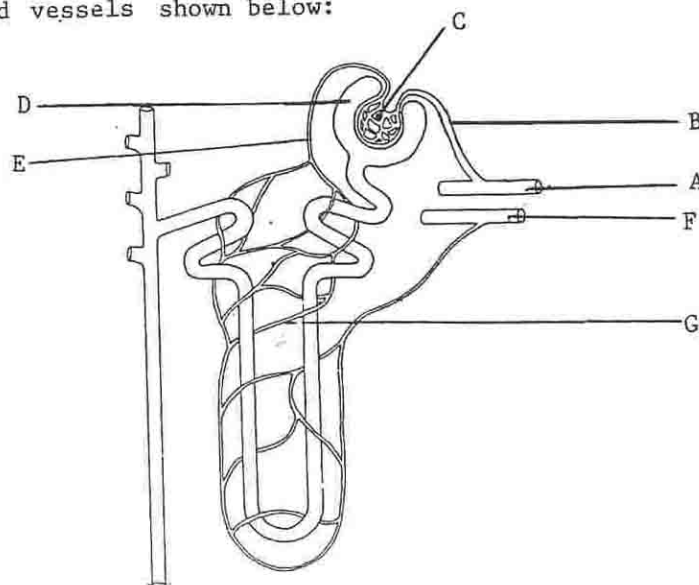
1. (a) The diagram below represents a small portion of the molecular structure of a nucleic acid.



- (i) Name the part of molecule indicated by the dotted box labelled X.
- (ii) What do the letters A, C, D, G, P and T in the diagram represent?
- (iii) What type of chemical bond is found at the point indicated by an arrow labelled Y? (4 marks)
- (b) Describe the properties which account for the DNA's suitability as material for heredity. (5 marks)
2. (a) Using well labelled diagrams compare the body plans in T.S. of hydra and earthworm. (5 marks)
- (b) (i) What is a coelom?
- (ii) Give the functions of a coelom. (4 marks)
3. (a) State the lowest classification taxon at which a cobra and a human are grouped together. Give reasons to support your answer. (4 marks)
- (b) Some biologists propose viruses to be living. What is their argument? (2 marks)
4. (a) The graph below shows the effect of substrate concentration on the rate of an enzyme controlled reaction.



- (i) Give a reasoned interpretation of the graph.
- (ii) How can the rate of reaction be increased? (5 marks)
- (b) What is the commercial importance of cellulose? (3 marks)
5. (a) (i) Define the term photophosphorylation.
- (ii) List three differences between cyclic and non-cyclic photophosphorylation. (6 marks)
- (b) Explain why it is important that active transport is employed in the absorption of end products of digestion. (2 marks)
6. (a) (i) What is respiratory quotient (RQ)?
- (ii) Using examples briefly explain when you would expect the RQ to be 1, less than 1 and greater than 1. (6 marks)
- (b) Differentiate between endothermy and ectothermy and give two examples of organisms for each case. (4 marks)
7. (a) Study carefully the diagram of a mammalian nephron with associated blood vessels shown below:



- (i) Label the structures indicated by letters A, B, C, D, E, F and G.
- (ii) By using the letters shown in the diagram trace the path of blood entering and leaving the nephron.
- (iii) What is the functional significance of having blood vessel B larger than blood vessel E? (6 marks)
- (b) A deep sea fisherman has exhausted his supply of fresh water while he is still far from land. As his thirst gets worse he resolves to drinking sea water and eating large quantities of fish. Explain why this will increase rather than lessen his problem. (3 marks)

8. (a) (i) Distinguish between localized growth and diffuse growth.  
(ii) State any three factors which influence growth in animals.  
(4 marks)
- (b) By means of a diagram show the life cycle of a maize plant.  
(6 marks)
9. Draw a labelled diagram of a mammalian motor neurone. (8 marks)
10. (a) Why is it not possible to use a homozygous dominant organism in a back cross (test cross) experiment to determine the genotype of an organism showing the dominant phenotype? Illustrate your answer fully.  
(4 marks)
- (b) Categorize the following list of human traits into continuous and discontinuous traits:  
tongue rolling, intelligence, height, blood groups, sex, skin colour.  
(3 marks)
11. (a) State any four factors which influence population distribution.  
(2 marks)
- (b) (i) What do you understand by the term "global warming"?  
(ii) Briefly explain how it is caused.  
(iii) What can you as an individual do to contribute toward slowing down "global warming"?  
(5 marks)
12. (a) What is a fossil? Very briefly describe how fossils are formed.  
(6 marks)
- (b) Summarize the deductions which Lamarck used to arrive at his theory of evolution.
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