

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

133/2

BIOLOGY 2

(For Both School and Private Candidates)

Time: 2 ½ Hours

Friday 16 May 2003 p.m.

Instructions

1. This paper consists of NINE (9) questions in sections A, B and C.
2. Answer FIVE (5) questions including at least one question from each section.
3. Each question carries 20 marks.
4. Read each question carefully before you start answering it.
5. Cellular phones are not allowed in the examination room.
6. Write your Examination Number on every page of your answer booklet(s).

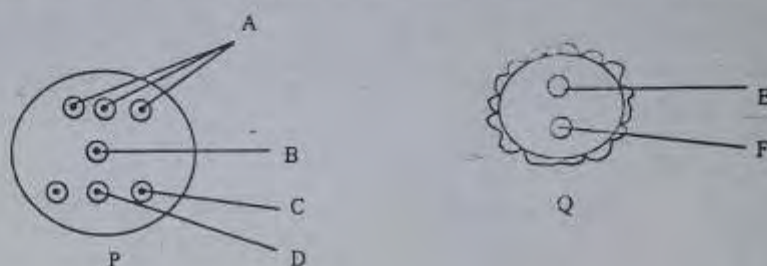
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This paper consists of 3 printed pages

### SECTION A

1. (a) Explain how the following are involved in the process of protein synthesis.
- RNA polymerase
  - Messenger RNA
  - Transfer RNA
  - UAA, UAG and UGA codons
- (b) Figures P and Q below represent two reproductive structures found in flowering plants.



- Identify the structures P and Q.
  - Name the plant structures in which structures P and Q are formed.
  - Name the structures represented by letters A to F.
  - Name the biological process involved in the formation of structures P and Q.
2. (a) Outline the life cycle of a named malaria causing parasite using fully labelled diagrams **only**.
- In what ways are viruses important to man?
  - Discuss the problems associated with the classification of viruses.

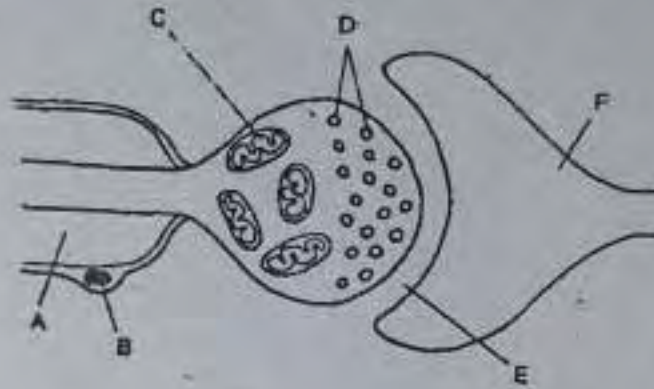
### SECTION B

- Describe the structure of the mammalian ear.
    - Explain how the organ of Corti operates.
  - Describe the pathway of a carbon atom from the air into a photosynthetic cell of a leaf and its subsequent fixation (assume its incorporation into a carbohydrate) until it releases energy in an active muscle of a mammal. (Details of biochemical processes are not required).
3. (a) The table below shows the main types of nitrogenous excretory products and the habitats of three classes of animals.

Class	Nitrogenous waste	Habitat
Ostrichthytes	ammonia	fresh water or marine
Mammalia	urea	land
Insecta	uric acid	land

- Explain the relationship between habitat and type of waste product.
  - Which of the above waste products is associated with the evolution of the cleidoic eggs?
- (b) Why is alcohol not recommended for diabetic victims?

6. Study the diagram of a nerve synapse below and then answer the questions which follow:



- (a) Identify structures A – F.  
(b) Why are the structures labelled C present in larger numbers?  
(c) Describe how impulse transmission across a synapse takes place.  
(d) List three functions of a synapse.
7. (a) Draw a labelled diagram of a human egg cell.  
(b) Discuss the functions of the placenta.

### SECTION C

8. (a) What do you understand by evolution?  
(b) Using relevant examples explain how comparative anatomy support the theory of organic evolution.
9. (a) Define the following terms:  
(i) Community  
(ii) Ecosystem  
(iii) Food chain.
- (b) Evaluate the use of studying food webs, rather than food chains, in ecology.  
(c) Consider the trophic levels of a pyramid of numbers and illustrate how energy is lost while passing through the levels.