

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 Hours 30 Minutes

2007 February, 23 Friday p.m.

INSTRUCTIONS

1. This paper consists of nine (9) questions in sections A, B and C.
2. Answer five (5) questions, choosing at least one (1) question from each section.
3. Each question carries 20 marks.
4. Cellular phones are not allowed in the examination room.
5. Write your Examination Number on every page of your answer booklet(s).

USA

This paper consists of 3 printed pages.

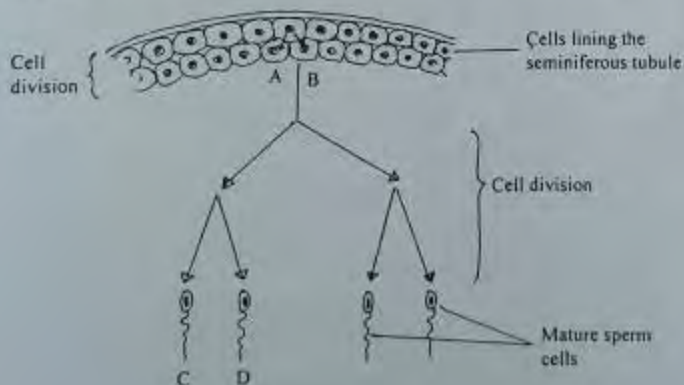
SECTION A

1. (a) What are enzymes?
- (b) Write an essay on enzymes using the following headings.
 - (i) Allosteric inhibitors.
 - (ii) Negative feedback inhibition.
 - (iii) Non-competitive irreversible inhibition. Give two (2) examples.
2. (a) Explain how plasmodium is adapted to its mode of life.
- (b) Draw a well labelled diagram of Euglena and explain how it resembles both plants and animals.

SECTION B

Answer at least one (1) question from this section.

3. (a) Explain how the activities of many glands of the vertebrate animal are regulated.
- (b) Why are the sound receptor cells of the ear called mechanoreceptors?
4. (a) Describe the roles of pancreas and liver in digestion and metabolism of the end products of digestion.
- (b) How is the small intestine adapted to its role of absorption?
5. Explain the following observations as fully as possible:
 - (a) Succulent plants can be found in both deserts and salt marshes.
 - (b) Marine teleosts (bony fish) excrete large quantities of ions, especially Na^+ , Cl^- , Mg^{++} and SO_4^{--} .
 - (c) Animals that live in the dry habitats tend to have much longer loops of Henle than animals that live where water is freely available.
 - (d) Eating a very salty meal leads to reduced urine output.
6. With reference to flowering plants and mammals, give an account on the importance of transport giving specific examples.
7. The diagram below shows the process of sperm formation in a mammalian testis.



- (a) Explain why cells A and B are genetically identical.
- (b) Describe two (2) ways in which cell division causes cells C and D to be genetically different.
- (c) Briefly describe how the process of gamete formation in an ovary leads to a smaller number of large gametes to be produced in a female mammal.
- (d) Both testis and ovary contain a large number of blood vessels. Other than cell division, what specific function of these organs is associated with these blood vessels?

SECTION C

- 8. (a) What do you understand by the term organic evolution?
- (b) Explain how the following processes lead to organic evolution.
 - (i) Genetic recombination.
 - (ii) Mutation.
 - (iii) Natural selection.
 - (iv) Geographic isolation.
- 9. (a) Define the following.
 - (i) Carrying capacity.
 - (ii) Population.
 - (iii) Environmental resistance.
- (b) The population size of dove in a certain area was estimated to increase from 20 doves in 1960 to 100 doves in 1962. The female dove can produce two offspring per year. From this information:
 - (i) Calculate the carrying capacity of that area.
 - (ii) Calculate the intrinsic rate of increase.
 - (iii) What will happen if the population increase is almost equal to carrying capacity?