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

133/1

BIOLOGY 1
(For Both School and Private Candidates)

Time: 2½ Hours

Tuesday 04 May 2004 p.m.

Instructions

1. This paper consists of 14 questions in sections A and B. Answer all questions in section A and four (4) questions from section B.
2. Read each question carefully before you start answering it.
3. Cellular phones are not allowed in the examination room.
4. Write your Examination Number on every page of your answer booklet(s).

This paper consists of 3 printed pages.

SECTION A

Answer all questions in this section. You are advised to spend not more than 90 minutes on this section.

1. A taxonomist is likely to face some problems in accomplishing his/her task.
 - (i) Who is a taxonomist?
 - (ii) What problems is he/she likely to encounter? (6 marks)

2. Giving two reasons in each case, allocate the following organisms in their appropriate phyla or divisions.
 - (a) Earthworm
 - (b) Mushroom
 - (c) *Taenia* sp.
 - (d) *Trypanosoma* sp. (8 marks)

3. (a) What is the role of each of the following in photosynthesis?
 - (i) Water
 - (ii) NADP
 - (iii) Light(b) Give three differences between C_3 and C_4 plants. (8 marks)

4. (a) What are the properties of respiratory surfaces?
(b) With the help of a simple diagram describe how gaseous exchange occurs in the mammalian lung. (8 marks)

5. (a) Giving reasons explain what happens when a petiole of a pawpaw leaf is partially split longitudinally into 4 pieces and immersed in distilled water for about 30 minutes.
(b) What are the essential features of a condiment collector? (6 marks)

6. A girl of normal vision whose father was colour-blind marries a man of normal vision whose father was also colour-blind. Using the genetic symbols, show clearly in terms of probabilities the type of vision expected in their children. (10 marks)

7. (a) What precisely do the terms "primitive" and "advanced" mean in evolution?
(b) Outline the limitations of Darwin's theory of Natural Selection. (6 marks)

8. (a) Define the term 'biological control'.
(b) What are the merits and demerits of using biological control, over the other methods of pest control? (8 marks)

SECTION B

Answer four (4) questions from this section. Each question carries 10 marks

9. (a) Account for the fact that megaspores of *Dryopteris* sp. are large and microspores are small.
(b) Explain how denaturing an enzyme may affect its efficiency as a catalyst

10. (a) Describe the way an impulse is transmitted along an axon.
 (b) Define a refractory period and state its significance.

11. Discuss the adaptations to oxygen uptake shown by:
 (a) Mountain dwellers.
 (b) Divers.
 (c) Mammalian foetus.

12. Outline the evidence:
 (a) For transport of organic material in the phloem.
 (b) Supporting the mass flow theory.

13. (a) Examine figure X below and answer the questions that follow.



Figure X Growth curve of an annual plant.

- (i) Why is there initial decrease in weight during the germination of the seed?
 (ii) What will the appearance of the seedling be when positive growth occurs at P?
 (iii) What physiological process occurs at P to account for positive growth?
 (iv) Account for the sudden decrease in dry mass after 20 weeks.
- (b) (i) What type of growth is exhibited in figure X?
 (ii) Explain briefly what happens during this type of growth.
14. (a) Define the following terms:
 (i) Sexual reproduction.
 (ii) Asexual reproduction.
- (b) Why do you think it is true that mitosis may be defined as an equational division and meiosis as a reduction division?
- (c) Identify the embryonic membranes found in mammals and state the roles of each.