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: 2:30 Hours **Tuesday, 15th February 2011 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 **twenty (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).

This paper consists of 4 printed pages.

SECTION A

1. (a) (i) Besides vitamins and hormones which occur only in certain cells in small amounts, list three (3) other most common but important substances of a cell. For each substance, indicate the chemical composition and two sites of production as shown in the table below.

Substance	Site of Production	Chemical Composition
1.		
2.		
3.		
4.		

(ii) From the chemical composition shown above, list four main chemical elements which constitute a living matter.

(b) "Enzymes are highly specific". Explain this concept giving a relevant example.

2. Study Figure 1 and answer the questions that follow.

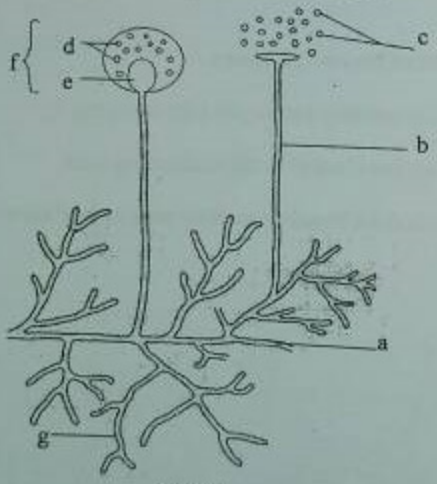

Figure 1

(a) Identify the organism in Figure 1 and name the structures labeled **a – g.**
(b) Discuss the adaptations of the organism in Figure 1 to its mode of life.

SECTION B

3. (a) Define
   (i) Taxis
   (ii) Nasties

   (b) Why are tactic movements very important to life and the existence of organisms?

   (c) What are the differences between hormonal and nervous control in animals?

4. (a) Explain briefly the role of the following in digestion.
   (i) Columnar epithelium
   (ii) Secretin hormone
   (iii) Cholecystokinin Pancreozymin (CCK-P2) hormone.
   (iv) Enterogastrone hormone.

   (b) Figure 2 shows the rate of photosynthesis in two species of plants at different light intensities.

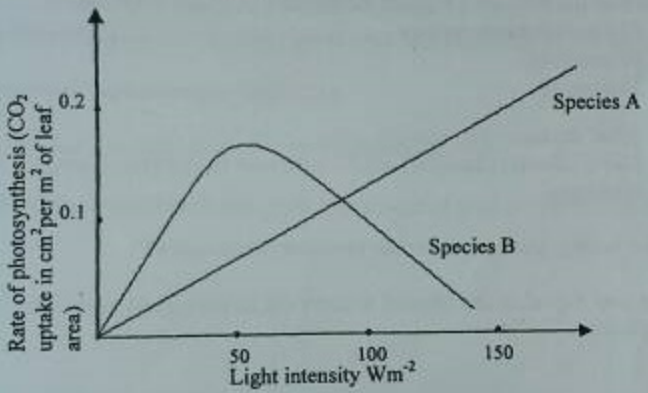

Figure 2

   (i) Which species show the best adaptation to shady conditions? Give reasons for your answer.

   (ii) Apart from light intensity, mention one other way in which light in a shady area differs from that in a sunny area.

   (iii) Many plant species that grow in the shade have low rates of respiration. What is the possible advantage of this?

5. (a) Explain why in cold weather humans produce more dilute urine than in hot weather.

   (b) What advantages do mammals have in using urea as a nitrogenous waste product?

6. (a) State the role(s) of the following structures:
   (i) Casparian strip
   (ii) Transfer cells in a leaf

   (b) Giving examples, distinguish closed circulatory system from open circulatory system.

7. (a) Describe the formation of a pollen grain and embryo sac in a flowering plant.

   (b) Explain how non-endospermic seeds develop.

SECTION C

8. (a) Define "Selection" as applied in evolution studies.

   (b) Explain how the following support the theory of organic evolution.
   (i) Comparative embryology
   (ii) Palaeontology
   (iii) Taxonomy

9. (a) (i) What are natural resources?
   (ii) Using relevant examples, describe the two main types of natural resources.

   (b) Why is it wise to use environmental resources sustainably?

   (c) Explain how a quadrat can be used to carry out an ecological study of a plant species.