

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

**133/1**

**BIOLOGY 1**  
(For Both School and Private Candidates)

**Time: 3 Hours**

**Year: 2022**

**Instructions**

1. This paper consists of sections A and B with a total of **ten (10)** questions.
2. Answer **all** questions in section A and **two (2)** questions from section B.
3. Section A carries **seventy (70)** marks and section B carries **thirty (30)** marks.
4. Except for diagrams which must be drawn in pencil, all writing should be in blue or black ink.
5. Cellular phones and any unauthorised materials are **not** allowed in the examination room.
6. Write your **Examination Number** on every page of your answer booklet(s).



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## SECTION A (70 Marks)

Answer **all** questions in this section. Each question carries **ten (10)** marks.

1. (a) A scientist placed  $2\text{ cm}^3$  of starch solution in a test tube followed by  $2\text{ cm}^3$  of saliva which was boiled to  $75^\circ\text{C}$ . He then carried out starch test and observed a positive result. Briefly explain the observation.
- (b) Eukaryotes have cells with organelles bound by membrane(s). Why is it advantageous for the organelles to be bound by the membrane(s)? Give three points.
2. (a) A biologist found some new insects which were supposed to be placed in the taxa. Among the tools which a biologist demanded for this work was a biological key. Why do you think a biologist needed a biological key? Give one point.
- (b) Suppose that you have been assigned to construct a Dichotomous Key;
  - (i) Describe the procedure you would follow.
  - (ii) How would you use the key constructed to classify the organisms?
3. (a) What would happen to an organism if its nervous system is severely damaged? Give four points.
- (b) Figure 1 is a part of a neuron. Study it carefully and then answer the questions that follow:

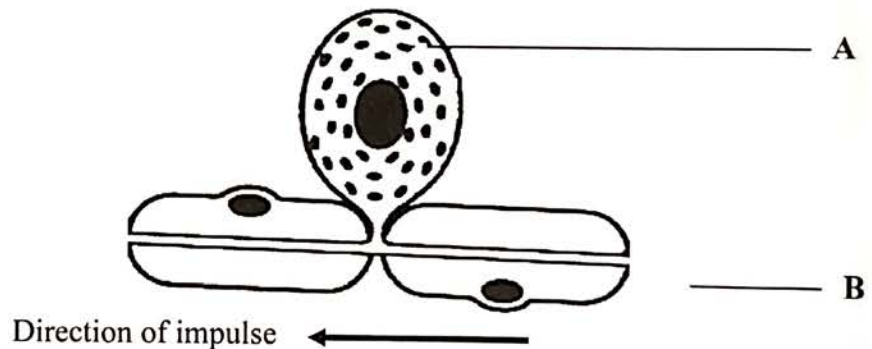


Figure 1

- (i) Identify the type of neuron presented in Figure 1.
  - (ii) Which feature has helped you to make identification in (b) (i)?
  - (iii) What would happen to the neuron if each of the parts labeled A and B is severely damaged? Give two points for each.
4. (a) The first process of photosynthesis involves trapping of light energy from the sun and then collecting it to the photosystems. How does this process takes place?
- (b) Explain how electron transport takes place in the photosystems I (PSI) and II (PSII).

5. (a) Why is it necessary for a respiratory surface to have each of the following features?
- Large surface area to volume ratio
  - Moist surface
  - Thin membrane
  - Permeable membrane
- (b) Glycolysis leads to the formation of pyruvic acid. How is the pyruvic acid converted to ethanol? Explain by giving two points.
6. (a) What would happen to a cell if its membrane lacks antigens? Give two points.
- (b) In what ways is water important to plants? Give four points.
7. Figure 2 represents a vertical section through an angiosperm ovary at the beginning of fertilization. Study it carefully and then answer the questions that follow:

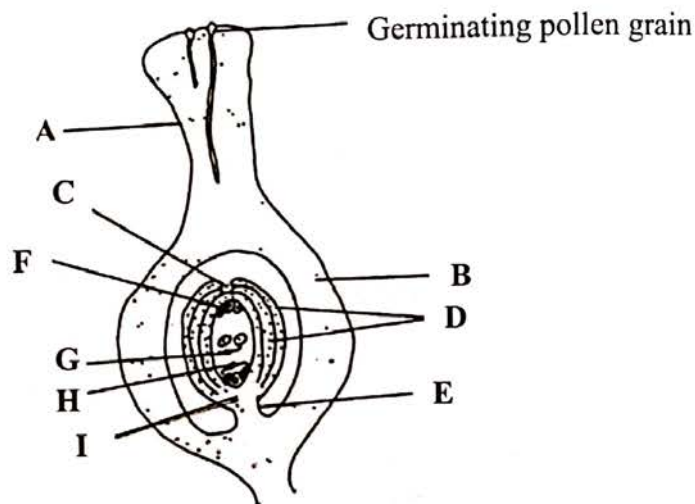


**Figure 2**

- (a) Using the given labels:
- list in correct order the parts of the ovary through which the pollen tube must grow in order to reach the embryo sac.
  - identify a part which performs similar function as the umbilical cord in human being.
- (b) If fertilization occurs successful:
- which part of the seed/fruit would develop from each of the parts labelled B, D, G and F?
  - what will be the fate of each of the parts labelled A and I?

## SECTION B (30 Marks)

Answer **two (2)** questions from this section. Each question carries **fifteen (15)** marks.

8. The release of energy from a glucose molecule occurs in three stages namely; glycolysis, Krebs' cycle and electron transport chain. Identify two essential features of each stage and explain how electron transport chain occurs in aerobic respiration.
9. Why should a mammalian placenta be formed immediately after implantation? Explain by giving six points.
10. Oxygen taken in through human nose enters the lungs and then it is transported to all parts of the body. Describe three ways in which oxygen is transported in human body.