

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: 2 Hours 30 Minutes

2007 February, 20 Tuesday p.m.

INSTRUCTIONS

1. This paper consists of **fifteen (15)** questions in sections A and B.
2. Answer **all** questions in section A and **two (2)** questions from section B.
3. Section A carries 70 marks and section B carries 30 marks.
4. Cellular phones are **not** allowed in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).

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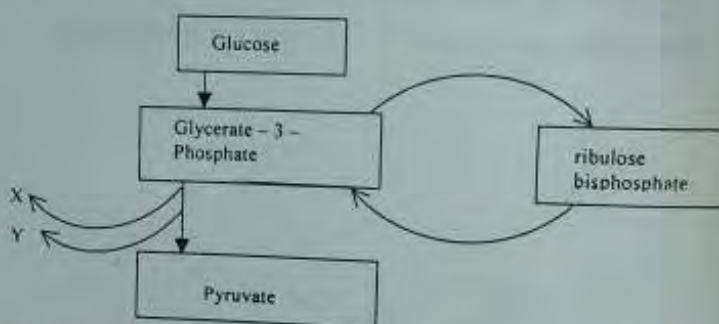
This paper consists of 4 printed pages.

SECTION A (70 marks)

Answer all questions in this section.

You are advised to spend not more than 90 minutes on this section.

1. (a) Give two (2) functions of each of the following cellular organelles.
 (i) Nucleus. (ii) Endoplasmic reticulum.
 (iii) Golgi apparatus. (iv) Lysosomes.
 (b) What advantages does a eukaryotic cell gain by having internal membrane-bound organelles? (08 marks)
2. (a) Explain why organism like Entamoeba, Euglena, Spirogyra and Phytophthora are put in kingdom Protocista despite their differences in many aspects. (03 marks)
 (b) Discuss briefly the ways Agaricus is adapted to its mode of life. (05 marks)
3. The diagram below shows chemical pathways involved in respiration and photosynthesis.



- (a) Name the process that produces pyruvate from glucose.
- (b) Name the compounds labelled X and Y.
 - (i) In which part of a chloroplast is glycerate-3-phosphate converted into ribulose biphosphate?
 - (ii) Describe the role of ribulose biphosphate in photosynthesis. (05 marks)
4. Distinguish between the following:
 - (a) Action potential and generator potential.
 - (b) Conduction and transduction of nerve impulses.
 - (c) Synapses and synapsis.
 - (d) Rods and cones in human eye. (08 marks)

5. (a) State the components of homeostatic mechanism.
(b) Explain briefly why the body temperature of a man standing beside a rock on a hot day remains relatively constant while that of a rock rises to about 50 °C. (07 marks)
6. (a) Distinguish between 'passive' and 'active' transport of materials within the body of an organism.
(b) Explain how water gets from the soil to the leaf vein. (07 marks)
7. (a) Why are oxygen and water required in the germination of seeds?
(b) State and describe two differences between endospermic and non – endospermic seeds. (08 marks)
8. (a) Define the term 'growth' as applied to multicellular organisms.
(b) When measuring growth in a living organism, what are the advantages and disadvantages of taking fresh mass and dry mass measurements? (07 marks)
9. (a) Define mutation.
(b) Explain why harmful recessive mutations are likely to survive in many generations than dominant mutations. (06 marks)
10. (a) What is meant by artificial selection?
(b) Give the differences between allopatric speciation and sympatric speciation. (06 marks)

SECTION B (30 marks)

Answer two (2) questions from this section.

11. (a) State the properties of enzymes.
(b) Sketch graphs to show the types of curves that would be obtained when investigating enzyme activity under constant conditions when:
(i) A fixed quantity of enzyme is used.
(ii) Excess substrate is used.
(c) Describe the roles of lipids in living organisms. (15 marks)
12. (a) Explain why human being cannot see clearly during the night, while cats and night birds like owl can see clearly.
(b) Give the importance of natural and synthetic phytohormones in crop production.
13. Discuss the ways in which oxygen and carbon – dioxide are transported in a mammalian body. (15 marks)
14. (a) A very large number of eggs is normally laid by animals with external fertilization, while many species with internal fertilization produce relatively few eggs. Explain.
(b) State and describe the critical hormonal changes in human females that respectively trigger ovulation and cause degeneration of the corpus luteum. (15 marks)

15. (a) In a population of human beings there are more colour blind individuals as compared to haemophiliacs. Genes for the two characters are transmitted in the same way. Explain this difference in frequency.

(b) A certain species of flies has the following genotypic attributes.

(i) Female flies have two X chromosomes (XX).

(ii) Male flies has one X and one Y chromosomes (XY).

(iii) The Y chromosome does not carry any gene.

(iv) The eye colour trait is sex linked, and red eye colour trait is dominant over white eye trait.

What would be the phenotypes and genotypes of the males and females in F_1 and F_2 when:

A white eyed female is crossed with a white eyed male?

(15 marks)