P530/2
BIOLOGY
(Theory)
Paper 2
July/Aug.2024
2 ½ hours



UGANDA TEACHERS' EDUCATION CONSULT (UTEC)

Uganda Advanced Certificate of Education BIOLOGY (THEORY) Paper 2

2 hours: 30 minutes

INSTRUCTIONS TO CANDIDATES:

This paper consists of six questions.

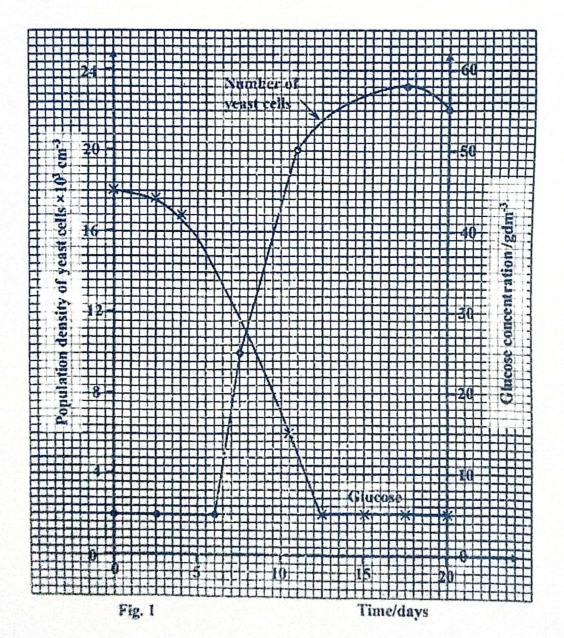
Answer one question in section A plus three others from section B.

Candidates are advised to read the questions carefully, organize their answers and present them precisely and logically, illustrating with well labelled diagrams where necessary.

SECTION A (40 MARKS)

In an investigation, a yeast culture containing initially 18000cm⁻³ and a supply of glucose was setup in a laboratory fermenter, which was placed in a water bath maintained at 35°C. The changes in glucose concentration and population density of yeast cells was estimated at intervals during the experiment.

Figure 1 shows the results obtained.



- (a). Describe the variation of;
 - (i) population density of yeast cells with time. (04marks)
 - (ii) glucose concentration with time. (03marks)
- (b). Explain the trend of population density of yeast cells between:
 - (i) 0 and 6 hours. (06marks)
 - (ii) 6 and 12 hours. (06marks)
- (c). Explain the relationship between glucose concentration and population density of yeast cells. (08marks)
- (d). (i) Calculate the percentage of glucose that remained at the end of the experiment. (03marks)
 - (ii) Suggest an explanation for the presence of some glucose at the end of the experiment. (08marks)
- (e). Explain why the temperature of the water bath was maintained at 35°C during the experiment. (04marks)

SECTION B (60 MARKS)

Answer any three questions from this section.

Amy additional question(s) answered will not be marked

- (a). Explain how each of the following organisms have solved their Osmo-regulatory problems.
 - (i) Fresh water fish. (06marks)
 - (ii) Xerophytes. (07marks)
 - (b). Explain why plants do not require excretory organs. (07marks)

- 3. (a). How is solar energy stored in an ATP molecule during photosynthesis? (08marks)
 - (b). Explain how the energy stored in ATP in (a) may flow to reach a carnivore. (12marks)
- 4. (a). How is the structure of the voluntary muscle tissue adapted for its functions. (10marks)
 - (b). Explain how a muscle fibre shortens when stimulated. (10marks)
- (a). Describe the reproductive features of flowering plants that have contributed to their ecological success. (07marks)
 - (b) Explain how each of the following affects plant growth:
 - (i) Light. (07marks)
 - (ii) Water availability. (06marks)
- 6. (a) Distinguish between gene and chromosome mutations. (03marks)
 - (b) Describe how gene mutations cause variations in a species.

(07marks)

(c) Explain the role of variations in (b) in evolution of species.

(10marks)

END