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)

1. 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^{0}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.

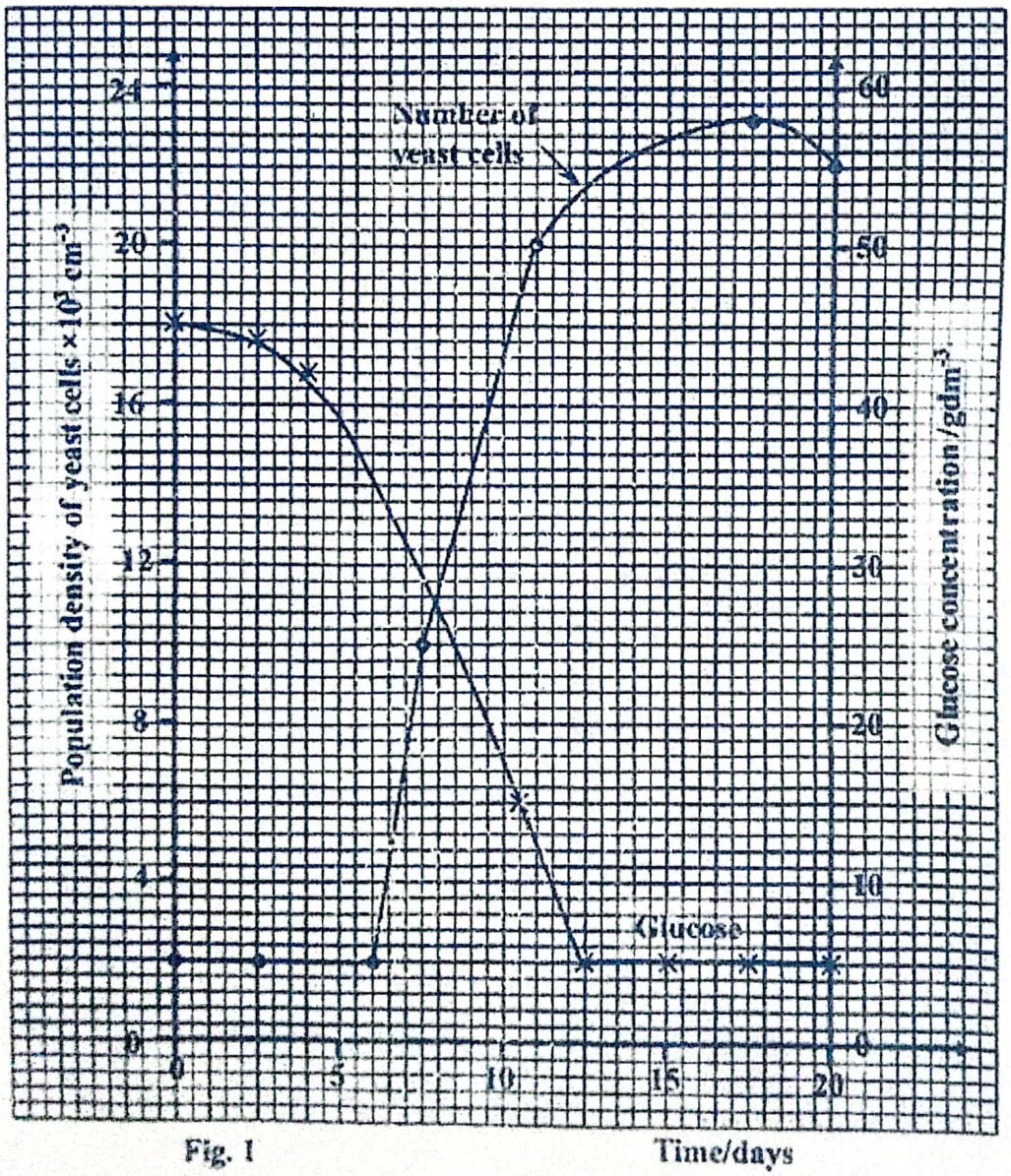

Fig. 1

(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 35^0C during the experiment. (*04marks*)

SECTION B (60 MARKS)

Answer any **three** *questions from this section.*

Amy additional question(s) answered will **not** *be marked*

2. (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)*

5. (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