KIIRA COLLEGE BUTIKI
Uganda Advanced Certificate of Education

BIOLOGY

(THEORY)

Paper 2
LOCK DOWN REVISION QUESTIONS 2020

SECTION A (40MARKS)

1. Figure 1 below shows the results of a study that was carried out to determine the relationship between population growth and population growth rate in Amoeba species in a period of 24 days.

Figure 1:

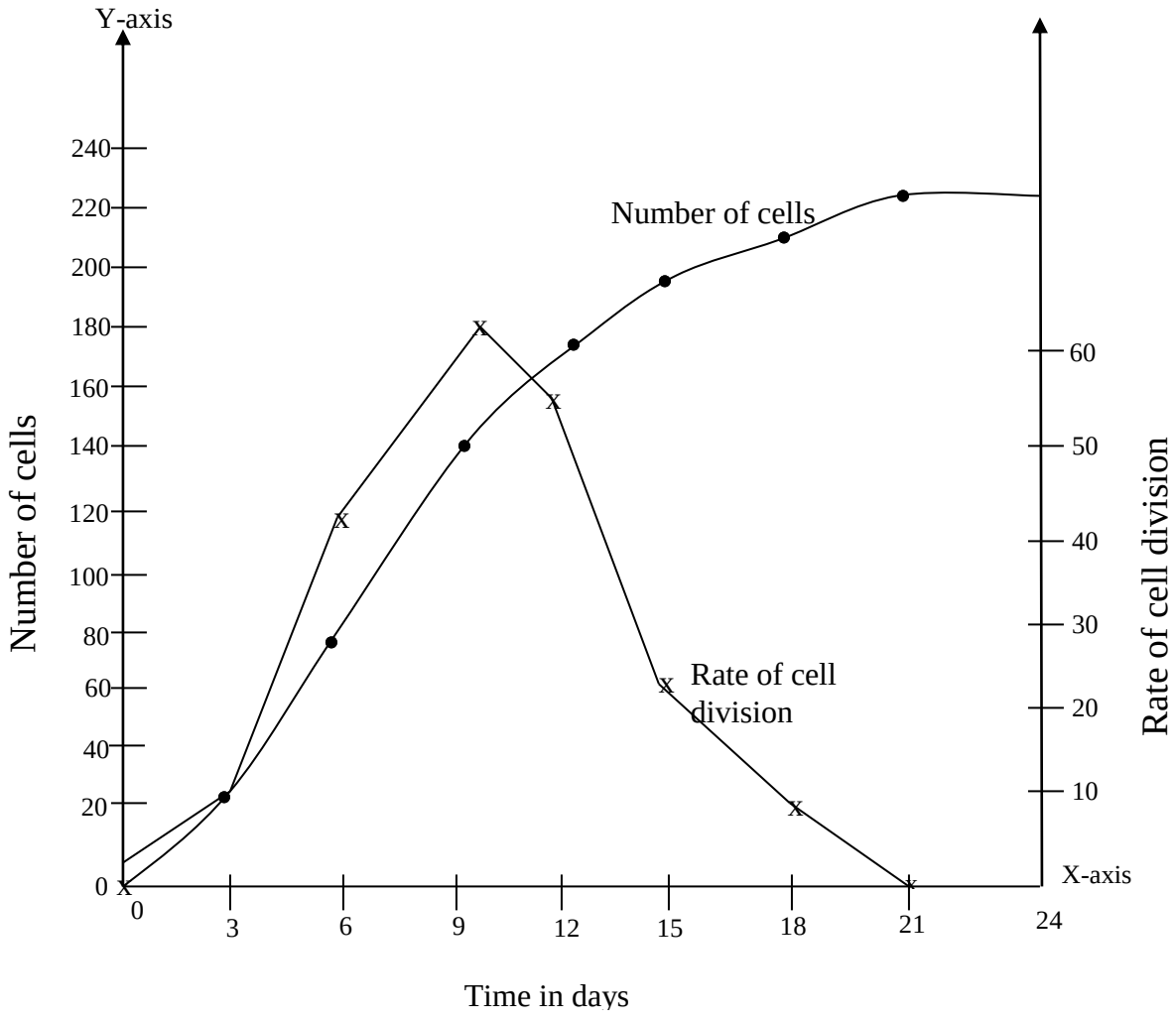
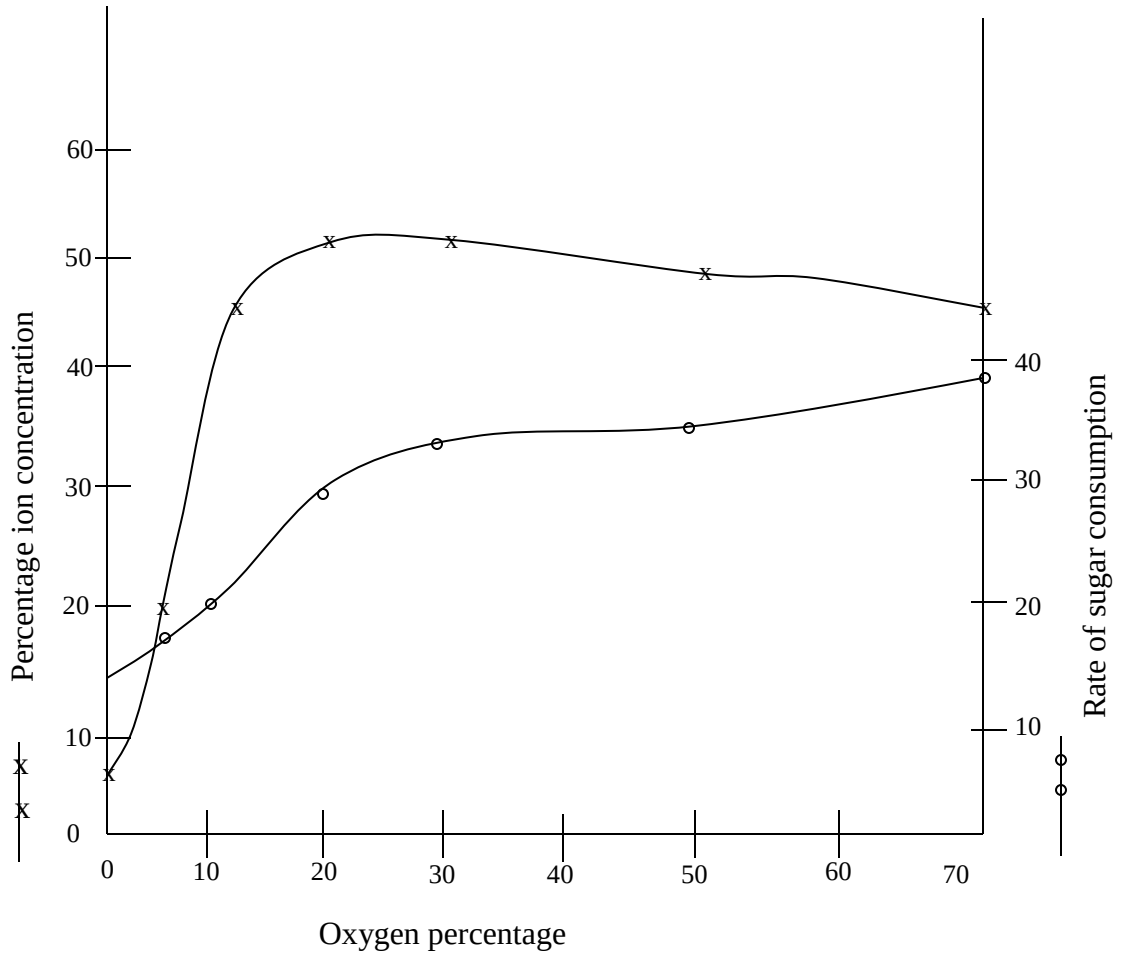


Figure 2 shows the relationship between potassium ion concentration in the roots and sugar consumption at different oxygen concentrations.

Figure 2



(a) (i) Define the term growth. (1 mark)
(ii) State three parameters that can be used to measure growth. (3 marks)
(iii) What limits the growth in size of an individual cell? (1 mark)
(iv) How is the effect in a(iii) above over come in single celled organisms? (2 marks)

(b) Describe precisely the graphs in figure 1 above. (13 marks)

(c) Explain the nature of the graph for the number of cells. (9 marks)

(d) What are some of the likely factors that could have contributed to the nature of the graph of population growth rate after the ninth day of the study? (4 marks)

(e) From figure 2 above; explain why;
(i) potassium ions are present in the root even at zero concentration of oxygen. (2 marks)

(ii) potassium ion concentration increases rapidly with increasing oxygen concentration up to 20. (2 marks)

(iii) potassium ion concentration begins to fall off after the peak at oxygen concentration of 20. (2 marks)

(iv) the rate of sugar consumption continues with increase in oxygen concentration through out the range shown. (1 mark)

SECTION B (60 MARKS)

2. (a) Describe how structure is related to function in a voluntary muscle tissue. (12 marks)

   (b) Contrast the structures of an involuntary muscle and that of a skeletal muscle. (8 marks)

3. (a) Describe the two possible routes through which electrons flow during the light reactions of photosynthesis. (20 marks)

4. (a) What is the significance of small size to seeds which require a stimulus of light for germination? (3 marks)

   (b) Describe the relative changes in dry mass of the endosperm and embryo during germination of sorghum. (14 marks)

   (c) Suggest three suitable conditions under which seeds for planting should be stored. (3 marks)

5. (a) What is alternation of generation with reference to plants? (4 marks)

   (b) Make a sketch diagram of the life cycle of a moss to show where mitosis, meiosis and fertilization have occurred. On your sketch show which stages are haploid and diploid. (6 marks)

   (c)(i) Distinguish sexual reproduction from asexual reproduction. (2 marks)

   (ii) Describe how plants are produced using vegetative propagation. (6 marks)

   (iii) Explain why animals are more difficult to clone than plants. (2 marks)

6. (a) (i) What is meant by imprinting and how does this differ from other forms of learning? (4 marks)

   (ii) How may a ‘learning set’ be formed and why is it useful? (4 marks)

   (b)(i) What role does the hypothalamus play in motivation? (4 marks)

(ii) Explain the connection between the photoperiod, hormones and reproductive behavior in some birds and mammals. (5 marks)

(iii) Name three types of endogenous rhythm and give an example of each. (3 marks)