P530/2
BIOLOGY
(Theory)
PAPER 2
July/August 2024
2 1/2 hours

WAKISSHA JOINT MOCK EXAMINATIONS

Uganda Advanced Certificate of Education

BIOLOGY

(Theory)

Paper 2

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

- *This paper consists of sections,* **A** *and* **B**.
- *Answer question* **one** *in section* **A** *plus* **three** *other questions from section* **B.**
- *Any additional question(s) answered will* **not** *be marked.*
- *Candidates are advised to read the questions carefully, organize their answers and present them precisely and logically.*
- *Illustrate with well labelled diagrams, wherever necessary.*

Turn Over

SECTION A (40 MARKS)

COMPULSORY QUESTION

1. An investigation was carried out on the two groups of plants **A** and **B** from the same habitant.
Plants of group A are mutant plants with a mutation in the gene for formation of enzyme A.thaliana which is responsible for synthesis of wax in leaves. The mutation prevents formation of the enzyme. Group B plants are normal control plants.
Figure 1 below shows the rate of water uptake in two groups of plants at different times of a day.

Figure 1

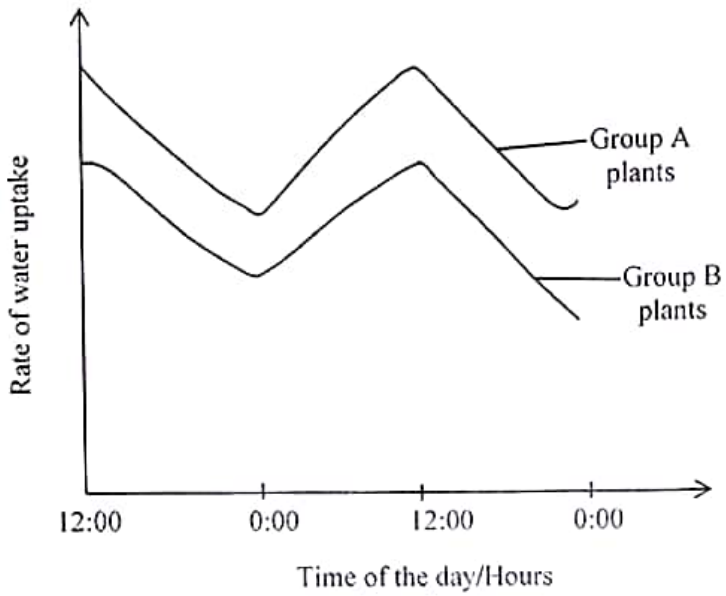
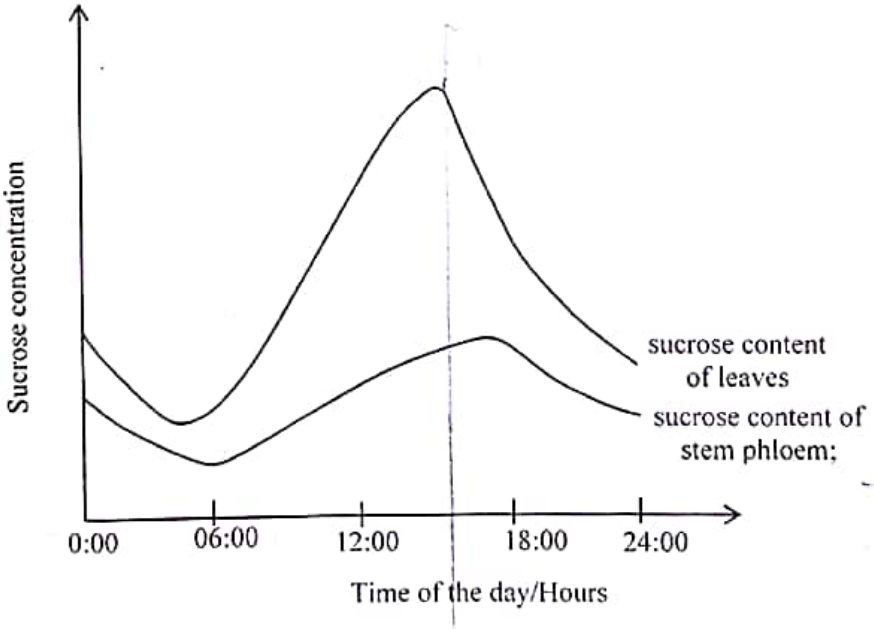


Figure 2 shows the concentration of sucrose in leaves and stem phloem of plants in group B

Figure 2



5. (a) Which examples, explain the meaning of displacement activity. (06 marks)

(b) State the importance of each of the following forms of behavior to the survival of organisms in the community.

(i) Territoriality (07 marks)

(ii) Courtship (07 marks)

6. (a) Explain the ecological effect of a persistent broad – spectrum pesticide to the ecosystem. (10 marks)

(b) Discuss the effects of application of phosphates and nitrate fertilizers in farms near water bodies on aquatic ecosystems. (10 marks)

END

Using figure. 1

(a) Explain the effect of time of the day on rate of water uptake by plants in group B. (12 marks)

(b) Explain the difference in the effect of time of the day on rate of water uptake in the two groups of plants. (05 marks)

Using figure 2;

(c) Compare the sucrose content of the leaves with sucrose content of stem phloem. (05 marks)

(d) (i) Explain the relationship between sucrose content of the leaves and sucrose content of the stem phloem. (09 marks)

(ii) Explain how the sucrose content of the stem phloem would be affected if the plant leaves were treated with a respiratory poison: (04 marks)

(iii) of what importance is translocation to plants? (02 marks)

(iv) What ecological advantage do plants in group B have over plants in group A? (03 marks)

SECTION B (60 MARKS)

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

2. (a) With examples, describe the function of lipids in organisms. (12 marks)

(b) Explain the biological significance of;
(i) branching of carbohydrate chains. (04 marks)
(ii) storing lipids rather than carbohydrates. (04 marks)

3. (a) Describe how the osmotic potential of fluids is controlled in the following organisms;
(i) Amoeba. (06 marks)
(ii) Humans. (10 marks)

(b) State the advantages of endothermy in mammals. (04 marks)

4. (a) Compare sexual reproduction in plants with sexual reproduction in animals. (07 marks)

(b) Describe the reproductive strategies flowering plants have employed to overcome the problem of desiccation on land. (08 marks)

(c) Explain how the principle of counter exchange is achieved between maternal and fetal circulation. (05 marks)