P530/2
BIOLOGY
(Theory)
PAPER 2
July/August 2025
2 1/2 hours

WAKISSHA JOINT MOCK EXAMINATIONS

Uganda Advanced Certificate of Education

BIOLOGY

(Theory)

Paper 2

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

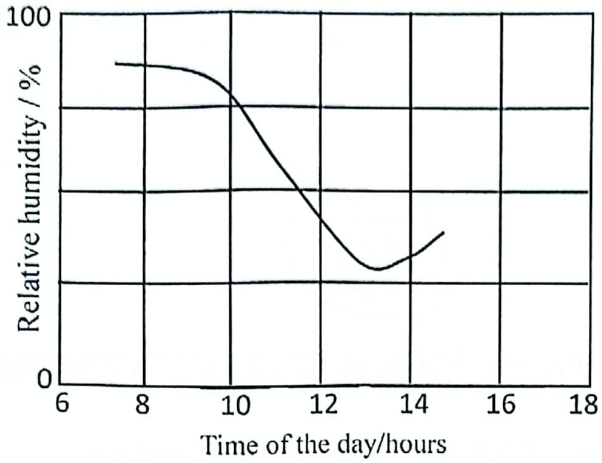
- *This paper consists of sections,* **A** *and* **B**.
- *Answer question* **one** *in section* **A** *plus* **three** *other questions from section* **B.**
- *Any additional question(s) answered will* **not** *be marked.*
- *Candidates are advised to read the questions carefully, organize their answers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

SECTION A (40 MARKS)

COMPULSORY QUESTION

1. Figure 1 shows changes in the relative humidity of the atmosphere during daylight hours of the day. Study it carefully and use it to answer the questions that follow.

Figure 1

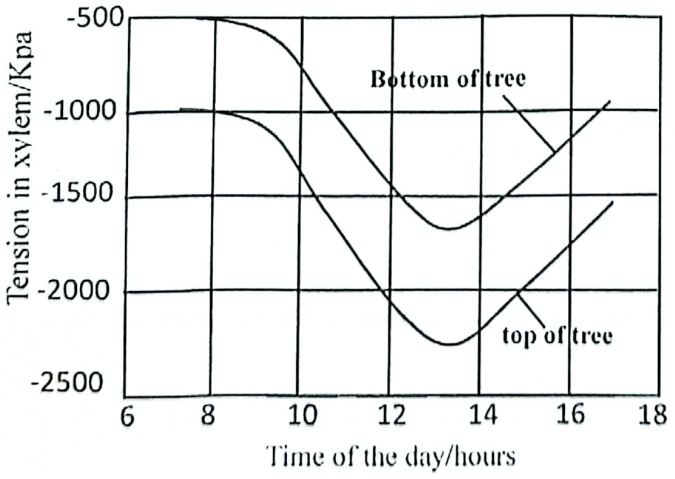


(a) Describe and explain how relative humidity varies with time of the day.
(10 marks)

(b) Draw the sketch curve of what would happen to relative humidity around the plant on a windy cloudy day and explain the curve. (Indicate the original curve)
(06 marks)

(c) In another experiment, tension in the xylem of different parts of a tree during the same period was measured. Figure 2 shows changes in tension of different parts.

Figure 2



(i) Compare the tension in the xylem of different parts. (06 marks)

(ii) Explain the differences observed in figure 2. (10 marks)

(d) How does relative humidity affect the uptake and movement of mineral ions?
(05 marks)

(e) State three adaptations of the xylem that makes it efficient in the transport of water and minerals in a plant. (03 marks)

SECTION B (60 MARKS)

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

2. (a) Explain the importance of the following structure and condition in organisms.
   (i) Coelom (05 marks)
   (ii) Metameric segmentation (03 marks)

   (b) Fungi and bacteria almost occupy the same ecological niche. Describe the physiological and behavioral features that make them share the same niche. Give examples. (12 marks)

3. (a) How is gaseous exchange achieved in
   (i) Plants. (05 marks)
   (ii) Earthworm. (05 marks)

   (b) With examples, explain how the problem of gaseous exchange is solved in large multicellur organisms. (10 marks)

4. (a) (i) Contrast local potential and action potential. (07 marks)
   (ii) How is unidirectional flow of impulses achieved at the synapse? (05 marks)

   (b) Explain the importances of
   (i) migration in fish. (03 marks)
   (ii) saturated fatty acids as energy stores in migratory birds. (04 marks)

5. (a) How are Mendel's principles of genetics related to behavior of chromosomes during nuclear division and fertilization? (05 marks)

   (b) Explain the genetic basis and evolutionary significance of allopolyploidy. (07 marks)

   (c) Describe how allele frequencies can be maintained within a population. (08 marks)

6. (a) Describe how growth in insects is controlled. (10 marks)

   (b) Explain the significance of shelled eggs in terrestrial animals. (05 marks)

   (c) Compare growth in plants and animals. (05 marks)

END