P530/2
BIOLOGY
Paper 2
(Theory)
Nov./Dec.2024
2½ hours

UGANDA NATIONAL EXAMINATIONS BOARD

Uganda Advanced Certificate of Education

BIOLOGY

Paper 2
(Theory)

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

This paper consists of **two** *Sections;* **A** *and* **B**. *It has* **six** *questions.*

Section **A** *is* **compulsory.**

Answer any **three** *questions from Section* **B.**

Answer **four** *questions in all.*

Any additional question(s) answered will **not** *be marked.*

Begin answering each question on a fresh page.

You are advised to read the questions carefully, organise your answers and present them precisely and logically, illustrating with well labelled diagrams where necessary.

Turn Over

SECTION A (40 MARKS)

1. Figure **1** shows the changes in the concentration of two growth hormones, abscisic acid and gibberellic acid in germinating apple seeds maintained at 25 °C after a period of cold treatment.
Figure **2** shows the percentage of apple seeds that germinated under the same conditions.

Study the two figures and answer the questions that follow.

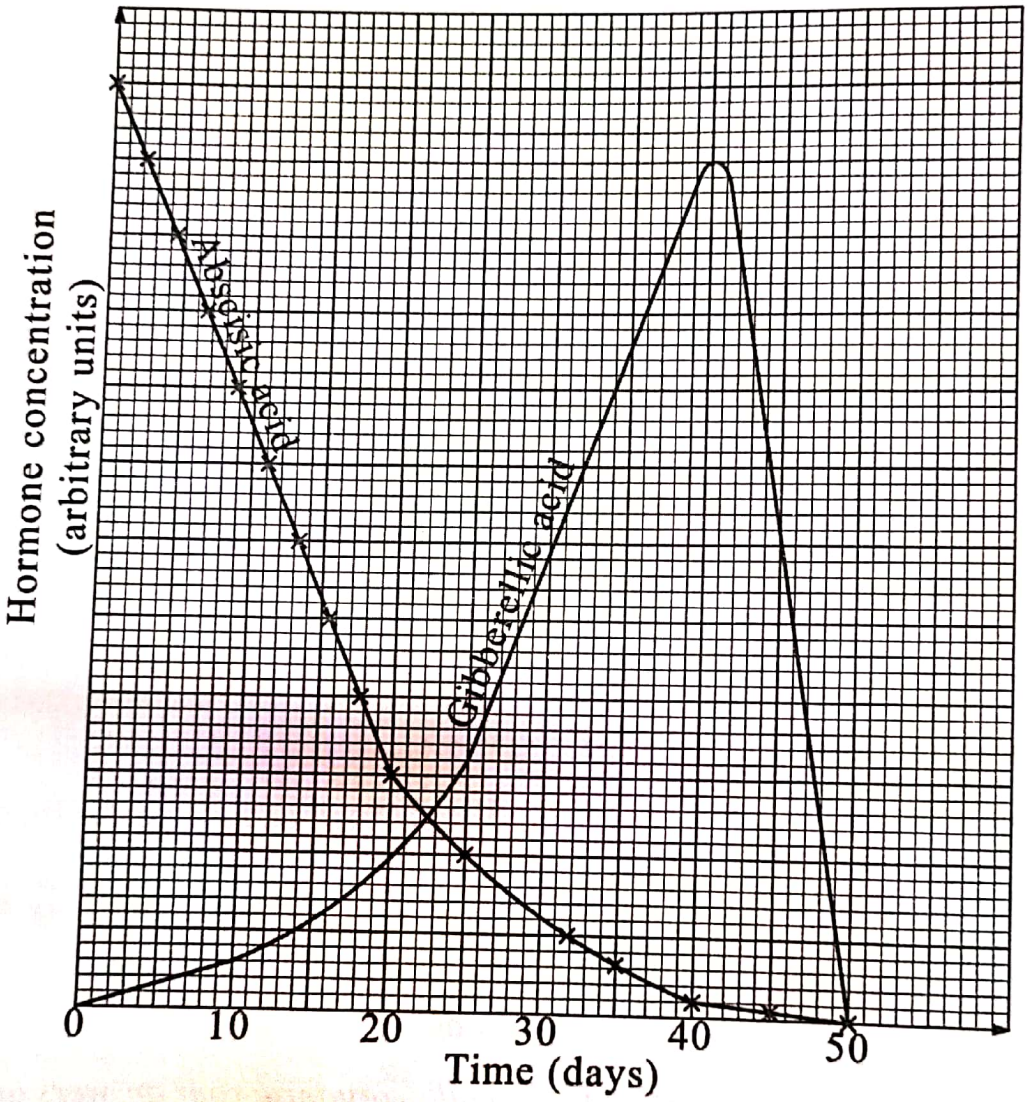

Fig. 1

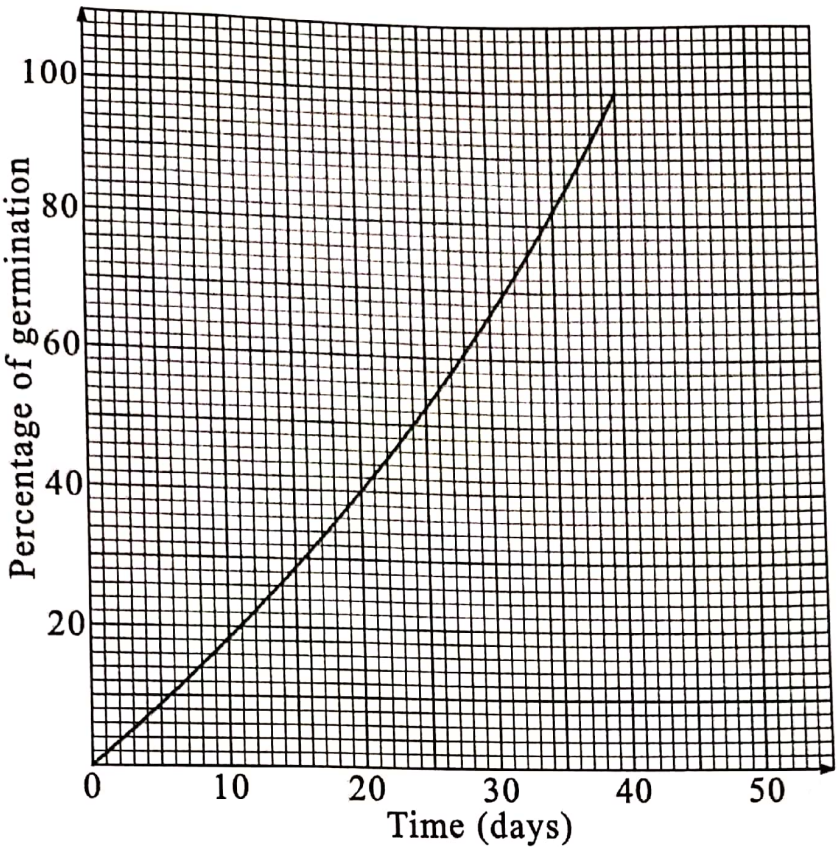

Fig. 2

(a) From figure **1**, describe the changes in the concentration of;

(i) abscisic acid. (*03 marks*)

(ii) gibberellic acid. (*05 marks*)

(b) From figure **1**, explain the changes in the concentration of;

(i) abscisic acid. (*05 marks*)

(ii) gibberellic acid. (*05 marks*)

(c) Explain how the concentration of;

(i) abscisic acid in figure **1** relates to the percentage of seeds that germinated in figure **2**. (*05 marks*)

(ii) gibberellic acid in figure **1** relates to the percentage of seeds that germinated in figure **2**. (*05 marks*)

(d) Explain the significance of cold treatment of seeds before planting. (*03 marks*)

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(e) Explain why a seed may remain dormant after dispersal even when the environmental conditions are favourable for germination. (*04 marks*)

(f) State the ecological significance of dormancy in seeds soon after dispersal. (*02 marks*)

(g) State **three** applications of plant growth hormones. (*03 marks*)

SECTION B (60 MARKS)

Answer any **three** *questions from this section.*
Any additional question(s) answered will **not** *be marked.*

2. (a) How is the structure of a mitochondrion suited for its function? (*12 marks*)

(b) How is ATP produced from NAD in the mitochondrion? (*08 marks*)

3. (a) Describe the life cycle of the common moss. (*16 marks*)

(b) State any **four** problems faced by terrestrial plants. (*04 marks*)

4. (a) How is the structure of the retina of a mammalian eye suited for its function? (*11 marks*)

(b) Outline the differences between the structure and function of the mammalian rods and cones. (*09 marks*)

5. (a) Compare gaseous exchange and ventilation mechanism in bony fish and cartilaginous fish. (*12 marks*)

(b) Describe the control of breathing in mammals. (*08 marks*)

6. (a) Describe the structure of a chloroplast. (*07 marks*)

(b) Outline the process of sucrose synthesis in C_4 plants. (*07 marks*)

(c) Explain how temperature and altitude influence the distribution of C_3 and C_4 plants. (*06 marks*)