

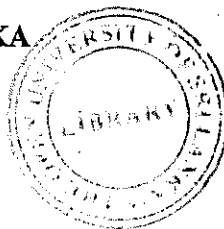
THE OPEN UNIVERSITY OF SRI LANKA

B.Sc. DEGREE PROGRAMME

BOTANY –LEVEL 05

FINAL EXAMINATION – 2009/2010

BTU 3103/BTE 5103 – PLANT GROWTH AND DEVELOPMENT



DURATION : TWO AND A HALF (2 ½) HOURS

DATE : 29<sup>th</sup> December 2009

TIME: 1.00 p.m. – 3.30 p.m.

ANSWER ANY FOUR (04) OF THE FOLLOWING QUESTIONS.

01.
  - a) What is the plant hormone that causes stomata to close and helps plants to respond to water loss?
  - b) What are the structural features of the hormone that are important for the activity of the hormone you mentioned in (a).
  - c) Briefly describe the biosynthetic pathway of this hormone.
  - d) How does this hormone inhibit seed germination?
  - e) Briefly describe the regulatory role of this hormone in stress situations.
02.
  - a) Compare and contrast the experiments carried out by Darwin and Went with regard to the discovery of auxins. What conclusions did they reach?
  - b) How does pH play a role in polar auxin transport?
  - c) Describe one (01) instance where auxin interacts with another hormone.
  - d) Discuss the role of auxin in the following:
    - i. Phototropism
    - ii. Geotropism
    - iii. Fruit development
03.
  - a) State the chemical nature of ethylene.
  - b) Discuss the following statement.

“Ethylene is the key hormone regulating abscission”
  - c) Explain the reason for the maintenance of low temperature, low oxygen and high CO<sub>2</sub> concentrations in fruit storage chambers.



- d) Differentiate between climacteric and non-climacteric fruits.
- e) What is the advantage of using ethylene-releasing substances in agriculture instead of using ethylene gas?

04. Write short notes on the following.

- a) Use of 'gibberellin synthesis inhibitors' in agriculture and horticulture.
- b) Embryogenesis in dicotyledons.
- c) Practical applications of abscission.

- 05.
- a) Indicate how water, temperature and light influence seed germination.
  - b) Briefly explain the different ways by which seed coat influences dormancy.
  - c) What type of seed dormancy is overcome by scarification?
  - d) Discuss two different ways of scarifying seeds.
  - e) Differentiate between
    - i. dormancy and quiescence
    - ii. Stratification and scarification of seeds
    - iii. epigeal and hypogeal germination

- 06.
- a) Differentiate between photoperiodism and photomorphogenesis.
  - b) "It is the length of the dark period that is critical for flowering" Explain.
  - c) A short-day plant with a critical night length of 15 hours is cultivated for its flowers. Giving reasons, state whether this plant would flower or not when exposed to the following conditions.
    - i. 16 hours of darkness
    - ii. 20 hours of darkness but given a flash of red light after 8 hours of darkness.
    - iii. 20 hours of darkness but given a flash of red light followed by a flash of far-red light after 8 hours of darkness.
    - iv. 10 hours of darkness and given a flash of red light during this period.
    - v. 12 hours of darkness.

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