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 : 29th 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_2 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 influence dormancy.

c) What type of seed dormancy is overcome by scarification?

d) Discuss two 02) 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 hors 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.