THE OPEN UNIVERSITY OF SRI LANKA

B.Sc. DEGREE PROGRAMME

BOTANY – LEVEL 05

FINAL EXAMINATION 2015/2016

BOU3102/BOE5102/BTU3103/BTE5103 - PLANT GROWTH AND DEVELOPMENT

DURATION :TWO (02) HOURS.

Date: 14th July 2016 Time: 9.30 a.m. – 11.30 a.m.

Answer any four (04) of the following questions.

01. (a) Define the following plant responses.

i. Phototropism

ii. Geotropism

(b) Explain the role of auxin in phototropism

(c) What are the two types of plant geotropisms?

Why do stem and the root show opposite geotropisms when a plant is kept horizontal?

(d) Briefly explain the phenomenon of 'apical dominance in plants'. How can it be artificially eliminated?

02. Discuss the following:

(a) Maintenance of low temperature, low oxygen and high carbon dioxide concentrations in fruit storage chambers is necessary to prevent over-ripening of fruits.

(b) Programmed cell death is essential for normal reproductive and vegetative development in plants.

03. (a) What is 'seed dormancy'?

(b) Differentiate between 'endogenous dormancy' and 'exogenous dormancy'.

(c) Name and describe four methods of overcoming seed dormancy.

(d) Briefly explain how hormones regulate seed dormancy.

(e) "From an ecological perspective, dormancy is an important survival mechanism". Discuss this statement.

04. (a) Plants show many types of senescence. List the different types of senescence seen in plants.

(b) Briefly explain how chlorophyll catabolism takes place during senescence.

(c) Discuss the role of various hormones in regulating leaf senescence.

(d) "Biological senescence and death have many advantages to plants". Discuss this statement.

05. (a) What is meant by "photoperiod"?

(b) Outline the practical importance of the knowledge of photoperiodism in agriculture and horticulture.

(c) State whether a plant with a critical night length of 10 hrs would flower under following conditions.

Give reasons in each case.

i. 15 hrs of day light followed by 9 hrs of darkness.

ii. 12 hrs of day light followed by 12 hrs of darkness

iii. 13 hrs of day light followed by 11 hrs of darkness with a flash of far-red light at hour 18.

iv. 12 hrs of day light followed by 12 hrs of darkness with a flash of red light at hour 18 followed by a flash of far-red light.

v. 10 hrs of day light followed by 14 hrs of darkness with a flash of red light at hour 17.

06. Write short notes on the following.

(a) Metabolic events of germination in a starchy seed.

(b) Proton pump theory in cell wall elongation.

(c) Hypersensitive response-type of programmed cell death (PCD) in plants during attack by pathogens.