

THE OPEN UNIVERSITY OF SRI LANKA

B.Sc./B.Ed. DEGREE PROGRAMME

BOTANY – LEVEL 05

FINAL EXAMINATION – 2016/2017

BOU3102/BOE5102 – PLANT GROWTH AND DEVELOPMENT

DURATION: TWO (02) HOURS



Date : 01st August 2017

Time: 9.30 a.m. – 11.30 a.m.

ANSWER ANY FOUR (04) OF THE FOLLOWING QUESTIONS.

01.
 - (a) What is the difference between a phytohormone and a growth regulator?
 - (b) Name two natural and two synthetic cytokinins.
 - (c) Indicate the biosynthetic pathway of cytokinins in plants. (Structural formulae are not required)
 - (d) Cytokinins have a very wide range of functions in plants. List these functions.
 - (e) Explain how cytokinins prevent or delay senescence.
 - (f) Briefly describe the involvement of cytokinins in the following:
 - i. Increasing grain yield in rice
 - ii. Formation of N-fixing nodules in legumes.

02. Explain the mechanism of each plant response given below.
 - (i) Nyctinasty
 - (ii) Abscission of leaves
 - (iii) Shade avoidance response in sun plants.

03.
 - (a) How do seed coat dormancy and embryo dormancy differ from each other?
 - (b) Briefly describe the different ways of overcoming 'physiological dormancy'.
 - (c) Many seeds fail to germinate unless phytochrome is in the P_{fr} form. What is the possible adaptive value of this requirement?
 - (d) How does seed germination facilitate beer making?

04. (a) What is photoperiodism?
- (b) What plant organs are responsible for the perception of variations in light?
What pigment is responsible for this perception?
- (c) A short-day plant with a critical night length of 14 hours is cultivated for its flowers. Giving reasons, state whether this plant would flower or not when exposed to the following conditions.
- (i) 15 hours of darkness
 - (ii) 20 hours of darkness but given a flash of red light after 9 hours of darkness.
 - (iii) 20 hours of darkness but given a flash of red light followed by a flash of far-red light after 9 hours of darkness.
 - (iv) 20 hours of darkness but given a flash of red light after 15 hours.
 - (v) 12 hours of darkness.
05. (a) Give the differences between zygotic embryos and somatic embryos.
- (b) Using fully labelled diagrams, describe the different stages of zygotic embryo development in dicots.
- (c) What are the practical applications of somatic embryogenesis?
06. Write short notes on the following.
- (a) Prospective uses of brassinosteroids.
 - (b) Role of programmed cell death in plants.