THE OPEN UNIVERSITY OF SRI LANKA

B.Sc./B.Ed. DEGREE PROGRAMME – LEVEL 04

FINAL EXAMINATION – 2006/2007

BOTANY

BTU 2201/BTE 4201 – PLANT PHYSIOLOGY (PAPER II)

DURATION : TWO AND A HALF (2 ½) HOURS

DATE : 21.06.2007 **TIME: 02.00 p.m. – 4.30 p.m.**

ANSWER ANY FOUR(04) OF THE FOLLOWING QUESTIONS.

01. a) Briefly discuss the characteristic properties of enzymes.

b) Describe and explain the effect of the following on enzyme catalyzed reactions.
   i. pH
   ii. Temperature
   iii. Substrate concentration.

c) Give an example of a competitive inhibitor of a named enzyme and explain its mode of action.

02. a) What are the main anatomical differences between the leaves of C_3 and C_4 plants?

b) Describe the biochemical pathway of carbon from its entry as CO_2 through the stomata of a C_4 plant leaf until it enters the phloem of the leaf.

03. a) Describe briefly the main events that take place during aerobic respiration, (structural formulae and equations are not required)

b) How many ATP molecules are produced in each of the main stages of aerobic respiration? What is the net gain of ATP when one molecule of glucose in respired?

04. a) What is nitrogen fixation?

b) Briefly describe natural processes by which nitrogen fixation is achieved.

c) Comment on the contribution of biological nitrogen fixation for the growth of crops.

05. Discuss the role of plant growth hormones in the following and describe how the knowledge about these processes have been put into use in horticultural and other industries.

a) Bud inhibition and apical dominance

b) Regulation of abscission of leaves and fruits.

c) Parthenocarpic fruit set

d) Induction of hydrolytic enzymes in the germination of cereal grains.

06. Plants A and B, both flower when exposed to day lengths of 12 hours.
Plant A will not flower with day length of 8 hours but plant B does.
Plant A flowers when exposed to day length of 16 hours but plant B does not.

a) Are these plants short-day plants or long-day plants? Give reasons.

b) If plant A is exposed to 10 hour day light will it flower? Give reasons.

c) What is phytochrome? Discuss its effect on flowering of short-day and long-day plants.

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