

UNIVERSITY OF RUHUNA
BACHELOR OF SCIENCE (GENERAL) DEGREE LEVEL II - (SEMESTER II)
EXAMINATION – JANUARY - 2018

SUBJECT: BOTANY

COURSE UNIT : BOT 2212 (Plant Physiology & Biochemistry)

Time: One & a half hours

Answer three (03) questions including the first question.

1. Answer the following questions using the space given below.

i). Among the different modes of water movement in plants, which one is known to be colligative?

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ii). How does the cylindrical shape of roots is advantageous for their function?

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iii). Which phenomenon commonly blocks water movement in vessel elements under state of water deficiency?

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iv). “Stomata do not always require substantially high light level to open”, verify the statement

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v). Consider the statement “stomatal movement solely depends on behavior of external environmental factors”, do you agree? Briefly justify your answer.

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Fill in the blanks with the most appropriate word/s.

vi). The mechanism of enzyme action is thought to be by lowering the ----- of a reaction.

vii). ----- is an example of a competitive inhibitor of succinic dehydrogenase enzyme.

viii). Three organelles involved in photorespiration are -----, ----- and -----.

ix). The first stable product in C_4 photosynthesis is -----.

x) ----- is the initial CO_2 acceptor in C_3 plants.

xi) The end products of the glycolysis are -----.

xii) The enzyme which has a higher affinity for CO_2 in C_4 plants is -----

xiii) Commercially available rooting hormone contains a mixture of ----- and -----.

xiv). In most plants, ethylene is synthesized from the amino acid -----.

xv) ----- is the hormone that triggers starch digestion in germinating cereal grains.

xvi). A plant hormone that controls closure of stomata in response to water stress is -----

xvii) ----- and ----- are two synthetic auxins which can be used as effective weed killers.

xviii) Induction of flowering by cold treatment is called -----.

2.

- a) List the characteristic features of a phytohormone.
- b) Explain briefly how endogenous level of cytokinin is regulated in plant tissues?
- c) Four short day plants with critical night length of 11.5 hours were exposed separately to the following light/dark cycles.
 - i) 10 hrs dark/14 hrs light
 - ii) 12 hrs dark/12 hrs light
 - iii) 12 hrs dark/12 hrs light and given a flash of red light during the dark period
 - iv) 12 hrs dark/12 hrs light and given a flash of red light followed by a flash of far red light during the dark period.

Giving reasons, explain whether the plants would flower under each (i-iv) of the above conditions.

3.

- a) Discuss briefly the significance of;
 - i) CO₂ fixation process in CAM plants
 - ii) Light reaction in C₃ plants
- b). Outline the pathway of alcoholic fermentation.

4.

- a) Name the three basic elements of the cohesion theory for the ascent of xylem sap.
- b) Explain upward water movement of a woody tree, comparing with a non-woody herb.
