

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF APPLIED SCIENCES

BACHELOR OF SCIENCE HONOURS DEGREE EXAMINATIONS

DEPARTMENT OF APPLIED BIOLOGY AND BIOCHEMISTRY

THEORY: PLANT PHYSIOLOGY SBB 1105

DECEMBER 2005

2 HOURS (100 marks)

INSTRUCTIONS

Answer Four (4) Questions. Each question carries 25 marks. Where a question contains subdivisions, the mark value for each subdivision is given in brackets. Illustrate your answer where appropriate with large, clearly labelled diagrams.

1. (a) Define seed dormancy and explain its causes. [5 marks]
- (b) Describe the mechanism by which barley seeds germinate and how seed germination might be inhibited in some other plant species. [20 marks]
2. Describe the essential features of the three types of photosynthetic plants and how they differ from each other.
3. In plant nutrition there are mineral elements which are considered 'essential'. Citing 5 examples, elaborate the term 'essential elements' and indicate in which of the two major groups of essential nutrients each of the five elements you mentioned can be placed. Indicate the role played in a plant by each of these 5 essential elements.
4. (a) Give a definition for allelopathy and allelochemicals. [5 marks]
- (b) State and explain 5 ways the allelopathic potential can be utilised in agroecosystems. [10 marks]
- (c) What are plant hormones? Describe and explain, in general terms, the mode of action of plant hormones. [10 marks]
5. Outline the light reactions which take place during photosynthesis, indicating where they occur.

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6. (a) Define mycorrhizas and describe two types of mycorrhizas, highlighting the differences between them. [7 marks]
- (b) Giving examples of the three groups of mycorrhizal dependency, define and explain mycorrhizal dependency. [10 marks]
- (c) Describe how plants benefit from their mycorrhizal association and then list soil and site factors affecting mycorrhiza. [8 marks]
7. (a) Describe the internal structure of a stem, indicating the major differences between monocots and dicots. [10 marks]
- (b) What are the constituents of a dicot root, and from where do lateral roots emerge/develop? [10 marks]
- (c) How are monocots different in the internal structure of their roots? [5 marks]

END OF EXAMINATION