

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF APPLIED SCIENCES

BACHELOR OF SCIENCE HONOURS DEGREE EXAMINATIONS

DEPARTMENT OF APPLIED BIOLOGY AND BIOCHEMISTRY

THEORY: ADVANCED APPLIED MICROBIOLOGY SBB 4109

MAY 2003

3 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. Discuss the microbial and metabolic changes that take place in anaerobic digestion for the production of methane-based biogas.
2. Explain the basis of the degradative abilities of white-rot fungi in relation to their natural habitat and in the potential for use in bioremediation.
3. a) Describe the photosynthetic apparatus and pattern of electron flow of purple bacteria and that of Cyanobacteria (15 marks)
b) Discuss the properties of Cyanobacteria that enable them to perform oxygenic photosynthesis and nitrogen fixation. (10 marks)
4. Write short notes on the following:
a) endosymbiont hypothesis (12 marks)
b) mycorrhizas (13 marks)
5. a) Define the following terms
(i) commensalism (ii) symbiosis (3 marks)
b) Describe the microbial and biochemical processes taking place in
(i) rumen symbiosis (ii) Rhizobium-leguminous plant symbiosis (22 marks)
6. a) Explain what you understand by the term "mycotoxin" and secondary "metabolites". (5 marks)
b) Give the origin, toxicity and food habitat of a named mycotoxin. (10 marks)
c) Discuss the general protocols required for mycotoxin analyses in foodstuffs. (10 marks)

END OF EXAMINATION

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