

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF APPLIED SCIENCES

BACHELOR OF SCIENCE HONOURS DEGREE EXAMINATIONS

DEPARTMENT OF APPLIED BIOLOGY AND BIOCHEMISTRY

THEORY: ENZYME BIOTECHNOLOGY SBB 4202

MAY 2002

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. Describe the different methods of immobilising enzymes, both physical and chemical.
2. a) Discuss the possible effects on an enzyme's kinetics and physical optima when immobilised. (10 marks)
b) Describe the advantages of using non-viable cells to effect enzyme-based transformations in a reactor. (10 marks)
3. Describe various reactor configurations possible for the use of immobilised enzymes or cells compared to those using soluble enzymes.
4. Give examples with brief explanations of the industrial uses of crude soluble carbohydrase enzyme preparations.
5. a) Describe the role of proteases in cheese manufacture and the recent developments made using modern biotechnologies. (10 marks)
b) Explain the different classes of proteases and their relative importance in industrial enzyme technology. (10 marks)
6. Discuss the commercial use of enzymes in medical diagnostic procedures.
7. Explain the use of lipases in water-poor non-polar organic solvents.
8. Discuss how the various uses of affinity based methods of purification of enzymes can be applied to reduce costs and the number of unit operations in down stream processing.

END OF EXAMINATION QUESTION PAPER

LIBRARY USE ONLY