

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF APPLIED SCIENCES
BACHELOR OF SCIENCE HONOURS DEGREE EXAMINATIONS

DEPARTMENT OF APPLIED BIOLOGY AND BIOCHEMISTRY

THEORY: ADVANCED BIOCHEMISTRY AND MOLECULAR PHYSIOLOGY SBB 4101

DECEMBER 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. Explain the role of **rec A** protein and **rec BCD** complex in the process of homologous gene rearrangements. What is meant by the SOS response in the operating machinery of DNA repair?
2. Present details and characteristics of different DNA-binding motifs of gene regulatory proteins and explain how the outside of the DNA helix can be read by these proteins.
3. Briefly discuss the difference between embryo twinning, reproductive cloning and therapeutic cloning. Compare and contrast the methods of adult-cell cloning used by Roslin and Wakayama.
4. Describe the two basic mechanisms by which a chemical signal, such as hormone or neurotransmitter, causes a biologic effect within a cell. Give examples of intracellular messenger systems.
5. Set out in detail the structure, chemical properties of contractile proteins and the mechanism of muscle contraction.
6. Summarise the metabolism and the function of the nervous tissue. Give examples of excitatory and inhibitory neurotransmitters.

END OF EXAMINATION QUESTION PAPER

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