

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

SBB 4204/01

FACULTY OF APPLIED SCIENCES  
BACHELOR OF SCIENCE HONOURS DEGREE EXAMINATIONS  
DEPARTMENT OF APPLIED BIOLOGY AND BIOCHEMISTRY  
THEORY: ADVANCED CELL BIOLOGY  
SUPPLEMENTARY EXAMINATIONS

JULY 2001

LIBRARY USE ONLY

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 labeled diagrams.

1. (a) What do you understand by the term proto-oncogene. Describe any three ways in which a proto-oncogene can be made oncogenic. (15 marks)  
(b) Write short notes on eukaryotic RNA polymerases. (10 marks)
2. Describe the desirable features of pBR322 plasmid that are relevant to cloning.
3. Describe the main features of the eukaryotic cell cycle and show how cyclin dependent protein kinases (cdk) control the cell cycle.
4. Write short notes on the following.
  - (a) Preparation of competent cells. (7 marks)
  - (b) Bacteriophage based vectors. (8 marks)
  - (c) Mitosis Promoting Factor (MPF) (10 marks)
5. Explain and describe the changes commonly observed when a normal tissue-culture is transformed by a tumour virus.
6. Define and describe the following techniques.
  - (a) Western ligand blotting (12 marks)
  - (b) Southern blotting (13 marks)