

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF APPLIED SCIENCES
BACHELOR OF SCIENCE HONOURS DEGREE EXAMINATIONS
DEPARTMENT OF APPLIED BIOLOGY AND BIOCHEMISTRY
THEORY: ADVANCED CELL BIOLOGY SBB 4204

DECEMBER 2001

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.

LIBRARY USE ONLY

1. Using clearly labelled diagrams, describe the main features of a standard vertebrate cell cycle and show how cyclins and cdk proteins control the cell cycle.

Write short notes on the following:
(a) Eukaryotic RNA polymerases (12 marks)
(b) RNA splicing (8 marks)
(c) Mitosis promoting factor (5 marks)
3. (a) What do you understand by the term proto-oncogene. Describe any three ways in which a proto-oncogene can be made oncogenic (18 marks)
(b) Write short notes on the p53 gene (7 marks)
4. (a) Describe the model for the activation of three signal transduction cascades by membrane-associated heterotrimeric G proteins (18 marks)
(b) Give a brief explanation of the status on plant receptor kinases (7 marks)
5. Define and describe the following techniques:
(a) Western ligand blotting (12 marks)
(b) Southern blotting (13 marks)
6. (a) Give a brief description of three models proposed to explain the long range influence of a locus control region (LCR) on gene activity (10 marks)
(b) Describe the role played by chromatin structure in regulating gene expression (15 marks).

END OF QUESTION PAPER