



**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF APPLIED SCIENCES
DEPARTMENT OF APPLIED BIOLOGY AND BIOCHEMISTRY**

**BACHELOR OF SCIENCE HONOURS DEGREE IN APPLIED
BIOLOGY AND BIOCHEMISTRY**

ADVANCED MOLECULAR CELL BIOLOGY SBB 4204

EXAMINATION PAPER

MAY 2017

This examination paper consists of 2 pages

Time Allowed: 3 hours

Total Marks: 100

Special Requirements:

Examiner's Name:

INSTRUCTIONS TO CANDIDATES

1. Answer Four (4) Questions. Each question carries 25 marks.
2. Where a question contains subdivisions, the mark value for each subdivision is given in brackets.
3. Illustrate your answer where appropriate with large, clearly labelled diagrams.

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1. (a) Briefly outline each stage of the cell cycle in a dividing somatic and germ-line mammalian cell. (10 marks)
(b) Describe the mechanisms of action of DNA damage check points in the cell cycle. (15 marks)
2. (a) Outline a general transformation protocol involving *Agrobacterium tumefaciens*, highlighting the potential challenges in recovering transgenic plants. (13 marks)
(b) Briefly review direct transformation methods used in plant genetic transformation. (12 marks)
3. Give a detailed account of the molecular mechanism of skeletal muscle contraction.
4. (a) Discuss the contrasting roles of kinesins and cytoplasmic dyneins in intracellular transport, including their modes of action. (15 marks)
(b) Briefly evaluate the role of cilia in human development and disease. (10 marks)