



RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. (Special) Degree in Applied Biology
Fourth Year – Semester I Examination – October/November 2017

MIB 4203 – TECHNIQUES AND STRATEGIES IN MOLECULAR BIOLOGY

Time: Two (02) hours

Answer ALL questions

1. a) Examine qPCR as a method of detecting viral loads. (30 marks)
b) A group of scientists hypothesized that membrane bound protein "A" is an auto kinase that interacts with signal "X" and phosphorylates protein "Y" which in turn acts as a transcription factor (upon phosphorylation) and helps expression of gene "q" as a response to "X". If all sequences and the signal are known, design a strategy to experimentally prove the hypothesis. (70 marks)
2. a) Compare **five (05)** nucleic acid probes used in live cell imaging in terms of resistance against nucleases and signal to noise ratio. (30 Marks)
b) Discuss the use of molecular caging with respect to live cell imaging. (20 Marks)
c) Develop a strategy to use fluorescent proteins to detect specific DNA sequences. (50 marks)
3. List **two (02)** "high-throughput techniques" used to investigate proteomes and discuss the importance of using "high-throughput" techniques instead of conventional techniques to investigate proteomes and transcriptomes. (100 marks)
4. You have identified **two (02)** key regulatory proteins involved in wing development in butterflies. You are interested in identifying when and where these proteins are expressed during wing development. Name **two (02)** techniques you would use in this experiment. List the steps of the experiment procedure and discuss the potential results and conclusions of your experiment. (100 marks)

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