RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. (Special) Degree in Applied Biology
Fourth Year Semester I Examination–June/July2018

MIB 4203 – TECHNIQUES AND STRATEGIES IN MOLECULAR BIOLOGY

Time: Two (02) hours

Answer ALL questions.

1. a) Briefly explain the natural function of CAS 9. **(30 marks)**

   b) Compare RNAi and CRISPR/CAS as knockdown tools. **(30 marks)**

   c) Propose a strategy to confirm function of a gene based on CRISPR/CAS. **(40 marks)**

2. a) Illustrate tandem affinity as a protein separation technique. **(30 marks)**

   b) Write an essay on the improvement of nucleic acid probes in live cell imaging in terms of reducing noise and overcoming degradation by nucleases. **(70 marks)**

3. a) Propose a strategy to localize a cytoplasmic protein in the nuclear membrane of a plant cell. **(30 marks)**

   b) Design a method to confirm the above localization. **(30 marks)**

   c) If your protein interacts with a nuclear protein "Y", develop a method to prove the interaction. **(40 marks)**

4. a) Describe mass spectrometry as a protein sequencing tool. **(30 marks)**

   b) Explain how qPCR could be used to determine the copy number of a gene. **(40 marks)**

   c) Describe how NGS methods could be used to study human microbiomes. **(30 marks)**

-----END----