



**RAJARATA UNIVERSITY OF SRI LANKA  
FACULTY OF APPLIED SCIENCES**

**B.Sc. (Special) Degree in Applied Biology**

**Third Year Semester I Examination– June/July 2018**

**MIB 3203 – VIROLOGY**

**Time: Two (02) hours**

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Answer **ALL** questions.

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**Part A: Short Answer Questions. (200 marks)**

1. a) Evaluate the role of repressor (R) protein in maintaining lysogeny in a  $\lambda$  bacteriophage. **(30 marks)**
- b) Martinus Beijerinck described the agent that caused tobacco mosaic disease (spot disease) as a contagious living fluid (*contagium vivum fluidum*). Discuss his experiment which led to this conclusion. **(30 marks)**
- c) Classify viruses according to Baltimore scheme (illustration not necessary). **(20 marks)**
- d) Provide reasons why clear majority of viral particles are built according to rules of geometrical symmetry. **(30 marks)**
- e) Justify the need for autoregulation of repressor (R) protein synthesis in the  $\lambda$  bacteriophage infectious cycle. **(30 marks)**
- f) During routine surveillance of seasonal influenza strains, several laboratories discovered a novel influenza strain with increased transmission efficiency. Explain how such novel influenza strains are generated. (Influenza viruses have segmented (-) ssRNA genomes). **(30 marks)**
- g) Explain briefly what an acute viral infection is. **(30 marks)**

**Part B: Essay Questions. (200 marks)**

2. A first-year biology student is concerned about why there isn't an effective vaccine against human immune deficiency virus (HIV), despite having successful vaccines against viruses such as smallpox, measles and polio developed many years ago. Furthermore, the student is curious why humans require smallpox, measles and polio vaccines only once in a life-time while influenza vaccine (flu shots) is given annually. Write down how you would explain about this phenomenon to the student using your knowledge in virology. **(100 marks)**
3. Compare inactivated (killed) and attenuated viral vaccines. **(100 marks)**

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