RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. in Applied Sciences
Third Year – Semester II Examination –July 2020

MIB 3201 – INDUSTRIAL MICROBIOLOGY

Time: Two (02) hours

Answer FOUR (4) questions only.

1. a) Discuss the microbial anaerobic digestion of biomass used in biogas production. **(40 marks)**

   b) You have been asked to develop a food waste and garden waste composting facility, what are the factors that you should consider when manufacturing standard compost to be used in organic farming. **(60 marks)**

2. Briefly explain the methods, which can be applied to bioremediate heavy metal contaminated soil. **(100 marks)**

3. a) Briefly categorized different microbial processes which can be used in industrial product formation. **(20 marks)**

   b) Differentiate batch culture fermentation and continuous culture fermentation. **(20 marks)**

   c) As a microbiologist, describe the factors you should consider in manipulating up stream process and down stream process when designing a fermenter for alcohol production [consider yeast (*Saccharomyces cerevisiae*) as the starter culture]. **(60 marks)**

4. Elaborate the following areas of industrial scale activated sludge systems using appropriate schema, microorganisms responsible, biochemical reactions and enzymes responsible.

   a) Biological nitrogen removal **(40 marks)**
   b) Enhanced biological phosphorus removal (EBPR) **(40 marks)**
   c) Anammox process (anaerobic ammonium oxidation) **(20 marks)**

5. "The microbial enzymes act as biocatalysts to perform reactions in bioprocesses in an economical and environmentally-friendly way". Evaluate this statement. **(100 marks)**

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