

**UNIVERSITY OF FORT HARE**

**BIOTECHNOLOGY AND ENVIRONMENTAL MICROBIOLOGY**

**MIC 514**

**FINAL ASSESSMENT**

**June 2023**

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**Time: 120 Minutes**

**Subject: BIOTECHNOLOGY AND ENVIRONMENTAL MICROBIOLOGY**

**Marks: 100**

**This paper consists of 2 pages including the cover page**

**Internal Examiners**

**Prof UU Nwodo**

**External Examiners**

**Prof E Green**

**INSTRUCTIONS**

**Answer all questions**

**Question 1 [25 marks]**

1. Viruses are known to infect every type of cell in humans, plants, and microorganisms;
  - I. With the aid of a well-labeled diagram, describe a virion
  - II. List six (6) characteristics of a virus
  - III. Describe the Baltimore classification of virus
  - IV. Mention five (5) differences between RNA virus and DNA virus
  - V. Define host range in relation to viral pathogenicity

**Question 2 [25 marks]**

- 2a. List any five (3) mycoses of medical importance and two (2) mycoses of public health concern known to you.
- 2b SARS Cov2 and MERS are viruses of significant interest to public health. Discuss these viruses in relation to the following headings;
  - i. Biology of the virus
  - ii. Pathogenesis
  - iii. Transmission
  - iv. Treatment

**Question 3 [25 marks]**

- 3a. Discuss the application of fermenters in the industry for the production of any biotechnologically relevant product of your choice.
- 3b. List the basic components of an industrial scale fermenter

**Question 4 [25 marks]**

- 4a. Microorganisms survive in all known environments, from water to food, from volcanic ash to deep-sea beds. Discuss microbial survival in the following extreme environments;
  - i. Low temperature environments
  - ii. Acidic environment
  - iii. High temperature environment
- 4b. Discuss microbial survival in the food under the following factors;
  - i. Intrinsic factor
  - ii. Extrinsic factor