



**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER I  
SESSION 2019/2020**

COURSE NAME : MICROBIAL DIVERSITY AND ECOLOGY  
COURSE CODE : BWJ 20203  
PROGRAMME CODE : BWW  
EXAMINATION DATE : DECEMBER 2019 / JANUARY 2020  
DURATION : 3 HOURS  
INSTRUCTION : ANSWER ALL QUESTIONS

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THIS QUESTION PAPER CONSISTS OF **THREE (3)** PAGES

- Q1** Microbes are important components of our ecosystems. These microscopic organisms play a key role in maintaining life on earth, fixing gases and breaking down dead plant and animal matter into simpler substances that are used at the beginning of the food chain.
- (a) Determine **ONE (1)** difference between a bacterium and a fungus. (4 marks)
  - (b) Explain why these two microorganisms are classified in different kingdoms. (6 marks)
  - (c) Elaborate the important roles of these two microorganisms to the environment. (10 marks)
- Q2** R. H. Whittaker (1969) proposed a Five Kingdom Classification under the domain of eukarya.
- (a) (i) Name all **FIVE (5)** kingdoms mentioned above. (5 marks)
  - (ii) Compare all **FIVE (5)** kingdoms in terms of their cell types (prokaryotes or eukaryotes) and mode of nutrition (autotrophs or heterotrophs). (10 marks)
  - (b) Determine **ONE (1)** differential trait of a prokaryotic cell from a eukaryotic cell and identify **FOUR (4)** of their major cell parts. (5 marks)
- Q3** Infectious diseases are caused by the entrance and reproduction of an infectious agents in a body.
- (a) Differentiate between bacteria and virus. (8 marks)
  - (b) Viruses replicate through **TWO (2)** methods of replication.
    - (i) Identify these **TWO (2)** methods of viral replication. (2 marks)
    - (ii) Facilitate your answer in **Q3(b)(i)** by preparing a diagram showing the **TWO (2)** methods of viral replication. (10 marks)

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- Q4** (a) Gram staining is a common technique used to differentiate two large groups of bacteria based on their different cell wall constituents. Demonstrate what happens to the bacterial cells during gram staining process.  
(10 marks)
- (b) Bacterial colonies can be identified through colony elevation. Give examples of **FIVE (5)** colony elevations that can be used to identify colonies.  
(10 marks)
- Q5** Nitrogen is needed by all organisms for the synthesis of protein, nucleic acids and other nitrogen-containing compounds. The activities of specific microorganisms are important to the conversion of nitrogen to usable form.
- (a) Determine the role of microorganisms in nitrogen cycle.  
(8 marks)
- (b) Compare and contrast the role of free-living nitrogen-fixing bacteria and symbiotic nitrogen-fixing bacteria.  
(12 marks)

- END OF QUESTIONS -

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