



UNIVERSITY OF RUHUNA
FACULTY OF FISHERIES AND MARINE SCIENCES & TECHNOLOGY
Academic Year 2022/2023

Bachelor of Science Honours in Fisheries and Marine Sciences Degree

Level III Semester I Examinations –April/May 2024

3132 : Microbiology for Aquaculture and Fisheries

Time: 1 hour & 30 minutes

Answer any three (03) questions

01.

a) Write whether the following statements are TRUE or FALSE. Justify your answers.

- I) Glycocalyx is described either as a slime layer or a capsule
- II) Flagella, fimbriae and pilli in a bacterial cell execute the same function
- III) The bacterial cell wall is composed of Murein which contains a Glycan portion, polynucleotides, and cross bridges
- IV) The plasma membrane of a bacterial cell is less rigid
- V) Glucose metabolism in bacteria is a catabolic reaction
- VI) Green non-sulfur and Purple non-sulfur bacteria are anoxygenic photoautotrophs
- VII) Plate count is the most appropriate approach to quantify the bacteria in a milk sample
- VIII) Lipid metabolism of bacteria is beneficial in controlling oil spills
- IX) Differential media used in microbiology facilitate the growth of only desired bacteria
- X) -50°C to -95°C is the temperature range used in freeze drying technique to preserve bacterial cultures

(50 marks)

b) "Some food preservation techniques can be implemented to control the bacterial growth by regulating their growth requirements". Justify this statement by providing examples.

(50 marks)

02. a) Summarize the following

- I) Glycolysis in bacterial carbohydrate metabolism
- II) Advantages and disadvantages of bacterial biofilms in aquaculture
- III) Chemoautotrophic and chemoheterotrophic bacteria
- IV) Trace elements and organic growth factors required for the growth of bacteria
- V) Two general processes used by bacteria for glucose metabolism

(50 marks)

b) Write an essay on "Indirect methods that are used to quantify the bacteria".

(50 marks)

03. "The beneficial effects of probiotics on farmed aquatic organisms are attributed to various modes of action." Discuss this statement.

(100 marks)

04. a) "Practices such as addition of feed and disinfection can lead to r-selection in the bacterial communities in conventional flow-through aquaculture systems." Justify this statement.

(50 marks)

b) "The primary function of a biofilter is to provide a habitat for beneficial bacteria."

Critically evaluate the given statement providing suitable examples.

(50 marks)

05. Write short notes on **any four (04)** of the following.

- a) Green water systems
- b) Biofloc technology
- c) Antibiotic resistance of bacteria
- d) Bacterial endospores
- e) Gut microbes of fish

(100 marks)

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