



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Eighth Semester – 2019

Paper: Environmental Microbiology

Course Code: ZOOL-431 Part – I (Compulsory)

Time: 15 Min. Marks: 10

Roll No. in Fig. ....

Roll No. in Words. ....

Signature of Supdt.:

**ATTEMPT THIS PAPER ON THIS QUESTION SHEET ONLY.**

**Division of marks is given in front of each question.**

**This Paper will be collected back after expiry of time limit mentioned above.**

Q.1. Encircle the correct option.

(10x1=10)

- i. The region where the soil and root make contact is designated as
  - A. Rhizosphere
  - B. Lithosphere
  - C. Hydrosphere
  - D. Xerosphere
  - E. None of these
- ii. Study of flora and conditions for the life in lakes, ponds and stream
  - A. Limnology
  - B. Marine biology
  - C. Littorology
  - D. None of the above
- iii. Microorganisms also help in production of food like
  - A. bread
  - B. fruits and seeds
  - C. vegetables
  - D. pulses
- iv. The concept of putting microbes to help clean up the environment is called
  - A. Pasteurization
  - B. Bioremediation
  - C. Fermentation
  - D. biolistics
- v. The nonsymbiotic bacteria which fix nitrogen live in the soil independently are
  - A. *Azotobacter*
  - B. *Clostridium*
  - C. considerably less important in comparison to the symbiotic bacteria
  - D. all of the above
- vi. The population of algae in soil is \_\_\_\_\_ that of either bacteria or fungi.
  - A. generally smaller than
  - B. generally greater than
  - C. equal to
  - D. none of these

P.T.O.

- vii. Most spoilage bacteria grow at
- A. acidic pH
  - B. alkaline pH
  - C. neutral pH
  - D. any of the pH
- viii. The surface waters are susceptible to contamination with microorganisms from \_\_\_\_\_
- A. the air
  - B. the surface runoff
  - C. precipitation
  - D. atmospheric water and the surface runoff
- ix. The principal microorganism for yogurt is \_\_\_\_\_
- A. *Streptococcus thermophiles*
  - B. *Leuconostoc citrovorum*
  - C. *Lactobacillus acidophilus*
  - D. *Streptococcus lactis*
- x. The use of microbes to break down synthetic waste products such as polychlorinated biphenyls is called
- A. Bioinformatics
  - B. Biolistics
  - C. Biotechnology
  - D. bioremediation



**ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED**

- Q.2. Give short answers of the following. (10x2=20)**
- i. What is meant by mineralization? Give an example
  - ii. Name several genera of bacteria that are nonsymbiotic nitrogen fixer.
  - iii. How to collect sample to study microbes present in air.
  - iv. What is meant by the term upwelling and gyre?
  - v. Write about competitive strategies of microorganism
  - vi. Blooms in lakes usually occur in the spring and fall. Why
  - vii. How can one distinguish among members of the coliforms?
  - viii. What are the attractive features of food preservation through use of radiation?
  - ix. Write briefly about fundamentals of microbial ecology.
  - x. What information does the phosphatase test reveal about milk?
- Q. 3 Outline the process of wastewater treatment which is followed in most large cities. Which steps in the process depend upon microbial activity for successful performance? explain (10)**
- Q. 4 Outline a procedure suitable for microbiological examination of foods (10)**
- Q. 5 Write a comprehensive note on nature of microbial communities. (10)**