

Roll No.

Total Pages : 3

019504

December, 2023

B.Tech. (ENV) Vth Semester

Environmental Microbiology (PCC-ENV-504)

Time : 3 Hours]

[Max. Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART-A

1. (a) Describe the various types of Microbial Ecosystems. (1.5)
- (b) What are the various types of protozoa when classified based on morphology? (1.5)
- (c) Describe the environmental factors that affect microbial activity. (1.5)
- (d) What are the various microbial indicators in water quality? (1.5)
- (e) Describe MPN analysis used for microbial enumeration. (1.5)

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- (f) What are microbial respiration tests and how do they determine microbial activity? (1.5)
- (g) Describe any *two* disinfection techniques in detail. (1.5)
- (h) Define microbial fuel cell and list its various key components. (1.5)
- (i) What are the various applications of microbial bioassays? (1.5)
- (j) What is the importance of microbial taxonomy? (1.5)

PART-B

- 2. (a) What is the importance of soil microorganisms and what is the role of beneficial microorganisms in plant growth? Also describe the ecosystem services provided by microbes and the impact of agricultural activities of Soil Microorganism. (10)
- (b) What are the different types of microbial interactions and what is its effect on Bioremediation? (5)
- 3. (a) Describe in detail the activated sludge process. (5)
- (b) Explain the bioremediation process as well as the types of bioremediation techniques. Also write a short note on microbial source tracking? (10)
- 4. Describe culture dependent and culture independent methods for microbial community analysis. Which of the two is more prevalent and why? (15)

- 5. (a) What is Microbial Quantification? What are the various filtration methods used for microbial quantification? (5)
- (b) Describe in detail the PCR and FISH processes. What are these processes used for? (10)
- 6. (a) What is microbial nanotechnology? What are its emerging applications in environmental context? (10)
- (b) Describe the strategies for detection and control of waterborne pathogens. (5)
- 7. What is microbial monitoring? Describe the monitoring strategies for Environmental system and the value of a monitoring system for early action as well as response. (15)