



'সমানো মন্ত্র: সমিতি: সমানী'

**UNIVERSITY OF NORTH BENGAL**

B.Sc. Honours 3rd Semester Examination, 2022

**SEC1-P1-MICROBIOLOGY**

Time Allotted: 2 Hours

Full Marks: 60

*The figures in the margin indicate full marks.*

**The question paper contains Paper-I and Paper-II. Candidates are required to answer any *one* from the *two* papers and they should mention it clearly on the Answer Book.**

**PAPER-I**

**MICROBIAL QUALITY CONTROL IN FOOD AND PHARMACEUTICAL INDUSTRIES**

1. Answer any **four** from the following: 3×4 = 12
  - (a) What do you mean by biohazardous wastes? Name few methods of discarding such wastes. 1+2
  - (b) What is enrichment culture? Give one example with proper mechanism. 1+2
  - (c) Explain standard plate count and its utility. 3
  - (d) Describe any one immunological method used for sterility testing of pharmaceutical products. 3
  - (e) What are biosensors? Give one example of microorganism used as biosensors. 2+1
  - (f) How XLD agar is used for detecting specific microorganisms? 3
  
2. Answer any **four** from the following: 6×4 = 24
  - (a) What is COB test? How resazurin assay is used to rapidly detect microbes in milk? 3+3
  - (b) What is HACCP? Explain it with proper flow diagram. 2+4
  - (c) Which facilities are required for working in a BSL-3 laboratory? State the difference between autoclave and incinerator. 4+2
  - (d) Describe PCR based detection techniques of microorganisms in food and pharmaceutical samples. 6
  - (e) State the BIS standards for common foods and drinking water. 6
  - (f) Explain detection of microbes using McConkey Agar and Saboraud's agar. 3+3
  
3. Answer any **two** of the following: 12×2 = 24
  - (a) Discuss the principle and utility of MPN method. State the principle of Limulus lysate test for endotoxin. 7+5

- (b) Explain the working principle of different types of biosafety cabinets. 12
- (c) What is disinfection? How is it different from sterilization? Give the working principle of an autoclave with suitable diagram. Why is moist heat more effective than dry heat? 2+2+6+2
- (d) Write notes on: 6+6
- (i) Gel diffusion
- (ii) Direct microscopic count.

**PAPER-II**

**BIOFERTILIZER AND BIOPESTICIDES**

1. Answer any **four** questions of the following: 3×4 = 12
- (a) Write a note on VAM. 3
- (b) Elucidate the process of phosphate solubilization. 3
- (c) What is the ecological significance of nitrogen fixation? 3
- (d) Write a note on synthetic pesticides citing examples. 3
- (e) Write a note on Integrated Pest Management. 3
- (f) Describe in brief the morphological changes that occur when bio-insecticides invade the pathogen. 3
2. Answer any **four** of the following: 6×4 = 24
- (a) What is meant by carrier based biofertilizer? What are the qualities of a good carrier? 2+4
- (b) Write a note describing the mass production of *B. thuringiensis* bioinsecticide. 6
- (c) Discuss the importance of Phosphate solubilising microorganism. 6
- (d) Discuss the important genes involved in nitrogen fixation by Symbiotic Nitrogen fixing bacteria. 6
- (e) Discuss why biopesticide is often preferred over chemical pesticides. 6
- (f) Write short notes on: 3+3
- (i) Cyanobacterial biofertilizers
- (ii) Frankia-Alder association.
3. Answer any **two** of the following: 12×2 = 24
- (a) Write notes on the isolation, characteristics and field application of *Azospirillum* sp. 4+4+4
- (b) Discuss in detail the constraints of biofertilizer technology. 12
- (c) Discuss the cultivation process and field application of viral pesticides. Name two viruses that are used as pesticides. 5+5+2
- (d) Discuss the isolation, production and field application of Rhizobium biofertiliser. 4+4+4

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