



'সমানো মন্ত্র: সমিতি: সমানী'

UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 3rd Semester Examination, 2021

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* questions from the following: 3×4 = 12
 - (a) What is HEPA filter? How does UV light kill microbes? 1+2
 - (b) What is endotoxin? Name one bacterium that produce endotoxin. 2+1
 - (c) What is COB test? How can it be used to check microbiological quality of milk? 1+2
 - (d) What is the difference between disinfection and sterilization? 3
 - (e) What do you mean by Good Laboratory Practices and why are they important? 3
 - (f) Write about EMB agar and its importance. 3

2. Answer any *four* questions from the following: 6×4 = 24
 - (a) Give the principles and limitations of HACCP. 6
 - (b) Discuss why detection of pathogenic microorganisms in food and water is necessary. Mention the methods that are used to detect such organisms in foods. 3+3
 - (c) Describe the methods used to ensure that autocleaning achieved sterility. 6
 - (d) Which facilities are required for working in BSL-2 laboratory? Give two bacterial samples handled in BSL-2 laboratory. 4+2
 - (e) What is biosensor? What are the advantages of using microorganisms as biosensing element? Give one example of microbial biosensor. 2+3+1
 - (f) Discuss about the principle, advantages and disadvantages of MPN method. 6

3. Answer any *two* questions of the following: 12×2 = 24
 - (a) Describe the molecular methods for determining microorganisms in food and pharmaceutical samples.

- (b) Give the principle of Limulus lysate test. What is lysate sensitivity and how is it calculated? Describe one immunological method used for sterility testing for pharmaceutical products. 4+3+2+3
- (c) Write short notes on: 6+6
- (i) Principle of Laminar air flow with suitable diagram
- (ii) Standard plate count of bacteria.
- (d) Explain how a microorganism can be detected using XLD agar and manitol salt agar. How microbial quality of milk is assessed by MBRT? What are the specifications for BSL-3? 6+4+2

Paper-II

1. Answer any **four** questions of the following: 3×4 = 12
- (a) Mention the desirable properties in organisms to be used as biofertilizers. 3
- (b) Write down the field application of *Azotobacter*.
- (c) State the economic importance of mycorrhizae.
- (d) What is the effect of denitrification in agriculture?
- (e) Write down the characteristics of PSM.
- (f) Write a brief note on *Frankia* and Alder association. 3
2. Answer any **four** questions of the following: 6×4 = 24
- (a) Write in detail about the isolation and characteristics of *Azolla*. 3+3
- (b) Write about different crop responses upon applications of cyanobacteria. 6
- (c) State the use of *B. thuringiensis* as bioinsecticides. 6
- (d) Write about the field application of ectomycorrhizae and VAM. 3+3
- (e) Write down the characteristics and growth of *Frankia*. 3+3
- (f) Discuss the cultivation and field applications of viruses as bioinsecticides. 6
3. Answer any **two** questions of the following: 12×2 = 24
- (a) How microbes can be used as bioinsecticides? State their advantages over synthetic pesticides. Name two synthetic pesticides. 6+4+2
- (b) Write in detail the isolation, mass inoculum production and field application of PSM. 4+4+4
- (c) Write short notes on: 6+6
- Isolation of (i) Symbiotic N₂ fixer *Rhizobium*
- (ii) Non-symbiotic N₂ fixer *Azospirillum*.
- (d) State the role of *Azolla* in rice cultivation. Mention the advantages of biofertilizers over chemical fertilizers. 6+6

—x—