



'समानो मन्त्रः समितिः समानी'

UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 4th Semester Examination, 2022

SEC1-P2-MICROBIOLOGY

Time Allotted: 2 Hours

Full Marks: 60

The figures in the margin indicate full marks.

The question paper contains SEC-3 & SEC-4. The Candidates are required to answer any *one* from the *two* papers. Candidates should mention it clearly on the Answer Book.

SEC-3: MICROBIAL DIAGNOSIS IN HEALTH CLINICS

1. Answer any **four** of the following: 3×4 = 12
 - (a) Briefly explain the method of transport of clinical samples to laboratory. 3
 - (b) What kind of pathogen can be detected using Lowenstein-Jensen medium? State its composition. 1+2
 - (c) Write about the principle and importance of gram staining in diagnostic techniques. 3
 - (d) Write a short note on different types of hemolysis that can be seen on blood agar. 3
 - (e) How to collect clinical samples from throat and urine? What are the precautions? 1½+1½
 - (f) Mention the differences between Competitive and Sandwich ELISA. 3

2. Answer any **four** questions: 6×4 = 24
 - (a) Define agglutination reaction. Discuss the various types of agglutination reaction used in diagnostic immunology. 2+4
 - (b) Mention the differences between MIC and MBC. Why are MIC and MBC clinically important? 3+3
 - (c) Illustrate the procedure for collection of clinical sample from skin. 6
 - (d) Write down the differences between Direct and Indirect Immunofluorescence. 6
 - (e) Give details of the working principle of Dengue detection kit. Define pathogenicity. 5+1
 - (f) Write a short note on transport and storage of clinical samples. Write down the colony properties of *Salmonella typhi*. 3+3

3. Answer any **two** questions: 12×2 = 24
 - (a) Which culture media would you choose to detect the presence of *Neisseria meningitidis* in a bacterial sample? Describe its preparation method. Describe the methods of storage clinical samples in the laboratory. 6+6

- (b) A patient is suspected to be suffering from malaria. Which staining technique can be used for its detection? Describe its working principle. MacConkey agar is used for culturing urine. Explain. 1+5+6
- (c) Describe the process of collection and transportation of throat sample and blood sample. Name two infections for the diagnosis of which the above samples are collected. 5+5+2
- (d) How will you determine the resistance and sensitivity of bacteria using Kirby Baver disc diffusion method? Derive an experiment. 12

SEC-4: FOOD FERMENTATION TECHNIQUES

1. Answer any *four* from the following: 3×4 = 12
- (a) Describe the chemical changes take place during bread making. 3
- (b) What is the difference between dahi and yogurt? 3
- (c) What are the criteria for good fermentation medium? 3
- (d) What should be the important characteristics of the microorganisms if they are used in food fermentation? 3
- (e) Differentiate between probiotics and prebiotics. 3
- (f) Why is salting important factor in Saur Kraut preparation? Name the substrate used for its preparation. 2+1
2. Answer any *four* from the following: 6×4 = 24
- (a) Give an example of any grain-based fermented food. Write down its preparation process with a proper flowchart. Also mention microorganisms involved in it. 1+4+1
- (b) What are fermented foods? Describe the process of bread making with flow diagram. 2+4
- (c) Describe the role of 'Lactic Acid' Bacteria in the production of milk-based fermented food. 6
- (d) Describe the process and microorganisms involved in cheese production. 6
- (e) Discuss the fermentation process and the microorganisms involved in meat and meat products. 6
3. Answer any *two* from the following: 12×2 = 24
- (a) With the help of flowchart, describe the process of yogurt production. In addition to that highlight the microbiological and chemical changes take place during yogurt production. 8+4
- (b) Discuss the role of microorganisms involved in preparation of fermented fish. Write about the health promoting effects of probiotics. 6+6
- (c) Write short notes on: 6×2 = 12
- (i) Production process of any one vegetable-based fermented food
- (ii) Production process and microbiology of Dahi.
- (d) State about the different types of fermented foods. Write details about advantages and health benefits of fermented foods. 3+4+5

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