



'সমানো মন্ত্র: সমিতি: সমানী'

UNIVERSITY OF NORTH BENGAL
B.Sc. Honours 3rd Semester Examination, 2023

GE2-P1-MICROBIOLOGY

Time Allotted: 2 Hours

Full Marks: 40

The figures in the margin indicate full marks.

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

GE

PAPER-I

INTRODUCTION AND SCOPE OF MICROBIOLOGY

1. Answer any **five** of the following: 1×5 = 5
 - (a) What is spontaneous generation?
 - (b) What is meant by active immunity?
 - (c) Define Probiotics.
 - (d) What is meant by parasitism?
 - (e) What is SCP?
 - (f) Define biofertilizer.
 - (g) What is meant by biogenesis?
 - (h) What is numerical aperture?

2. Answer any **three** of the following: 5×3 = 15
 - (a) Write in detail about Carl Woese's three kingdom classification of microorganisms. 5
 - (b) Write down general characteristics of Archaea. 5
 - (c) Write a note on contributions of Anton van Leeuwenhoek. 5
 - (d) Write note on nutrition, locomotion and reproduction of *Plasmodium*. 5
 - (e) Differentiate between mutualism and commensalism. 5

3. Answer any **two** of the following: 10×2 = 20
 - (a) Write a short note on Binomial Nomenclature. Write the difference between prokaryotes and eukaryotes. 5+5
 - (b) Write short notes on contributions of Louis Pasteur. Discuss the principle of fluorescence microscope. 5+5

- (c) Discuss different types of antibody and their functions. 6+4
- (d) What are "Prebiotics"? Discuss the benefits of taking probiotics regularly. 2+3+5
Describe different types of fermenters.

GE
PAPER-II
MICROBIAL METABOLISM

1. Answer any *five* questions: 1×5 = 5
- (a) Name one methanogen. 1
- (b) What do you mean by passive diffusion? 1
- (c) Define water activity. 1
- (d) What is specific growth rate? 1
- (e) What is aerobic chemolithotrophy? 1
- (f) What is ETC? 1
- (g) Define symport. 1
- (h) Mention the optimal temperature requirement of hyperthermophiles. 1
2. Answer any *three* questions: 5×3 = 15
- (a) Write a note on the photosynthetic pigments in green sulphur bacteria. 5
- (b) Write a note on uniport, antiport and symport. 5
- (c) Schematically describe the process of methanogenesis. 5
- (d) How do microorganisms in a chemostat differ from microorganisms in a batch culture? 5
- (e) How do photoautotrophs differ from photoheterotrophs? 5
3. Answer any *two* questions: 10×2 = 20
- (a) How do electron transport reaction generate the proton motive force? Write a short note on ATP synthase. 7+3
- (b) How do hyperthermophiles prevent intracellular protein, lipid and DNA from destruction by strong heat? 3+4+3
- (c) Describe the reductive amination and GS-GOGAT pathway operated during inorganic ammonia assimilation. 5+5
- (d) Write a note on the reductive and oxidative intermediates of TCA cycles. Name the steps where NADH, FADH and GTP are produced in TCA cycle. 6+4

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