



'समानो मन्त्रः समितिः समानी'

UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 3rd Semester Examination, 2021

GE2-P1-MICROBIOLOGY

Time Allotted: 2 Hours

Full Marks: 40

The figures in the margin indicate full marks.

Candidates should answer in their own words and adhere to the word limit as practicable.

All symbols are of usual significance.

**The question paper contains GE3-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.**

GE3

PAPER-I

1. Answer any **five** questions from the following: 1×5 = 5
 - (a) What are animalcules?
 - (b) What is axenic culture?
 - (c) Define mycotoxin.
 - (d) What is commensalism?
 - (e) What is numerical aperture?
 - (f) What are prions?
 - (g) What is germ theory of disease?
 - (h) Why is 70% alcohol more effective than 90%?

2. Answer any **three** questions from the following: 5×3 = 15
 - (a) What is bioreactor? Write down about aerobic fermenter with suitable diagram. 2+3
 - (b) Describe about various microbe-microbe interaction with suitable example of each case. 5
 - (c) Discuss about the contributions of Winogradsky. 5
 - (d) What is food spoilage? Describe about the factors that are responsible for food spoilage. 1+4
 - (e) Describe with diagram the working principle of an autoclave. 5

3. Answer any **two** questions from the following: 10×2 = 20
 - (a) What is spontaneous generation and how was it disproved? Write a brief note on Whittaker's five kingdom classification. 6+4
 - (b) With suitable diagram describe the structure of IgG. Write down the comparative account of different classes of immunoglobulin. 6+4

- (c) With suitable diagram explain the working principle of fluorescence microscope. Explain how does resolving power of a microscope depends on refractive index of medium and wavelength of light source. 6+4
- (d) Elaborate the health benefits of probiotics. Write about application of microorganisms as SCPs mentioning their advantages and disadvantages. 4+6

PAPER-II

MICROBIAL METABOLISM

1. Answer any *five* questions from the following: 1×5 = 5
- (a) State the relationship between generation time and specific growth rate.
- (b) How many ATP molecules are liberated during aerobic respiration using glucose?
- (c) What is Pasteur effect?
- (d) What is ANAMMOX?
- (e) Define denitrification.
- (f) What is water activity?
- (g) What are microaerophiles?
- (h) Define diauxic growth.
2. Answer any *three* questions from the following: 5×3 = 15
- (a) Differentiate between Passive diffusion and Facilitated diffusion. Write a short note on group translocation. 3+2
- (b) What are the reasons for microorganisms for entering stationary phase? What are trophophase and idiophase? 3+2
- (c) With a suitable flowchart briefly describe the pentose phosphate pathway. Why is it called a shunt pathway? 4+1
- (d) Briefly describe Q cycle in ETC. State the effect of cyanide in ETC. 3+2
- (e) State the differences between oxygenic and anoxygenic photosynthesis. 5
3. Answer any *two* questions from the following: 10×2 = 20
- (a) Classify microbes on the basis of energy, electron and carbon sources they utilized. With suitable examples explain the process of methanogenesis. 6+4
- (b) Describe with proper flow diagram the homo and hetero lactic fermentation pathway. 5+5
- (c) Briefly describe the process of biological N₂-Fixation. Compare and contrast between assimilatory and dissimilatory nitrate reduction. 5+5
- (d) What are the differences between batch and continuous culture? With suitable diagram briefly explain chemostat and turbidostat. 4+3+3

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