'समानो मन्त्रः समितिः समानी'

UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 1st Semester Examination, 2021

GE1-P1-MICROBIOLOGY

Time Allotted: 2 Hours | Full Marks: 40

The figures in the margin indicate full marks.

The question paper contains GE1-Paper-I and Paper-II.
Candidates are required to answer any *one* from the *two* papers.
Candidates should mention it clearly on the Answer Book.

GE1

PAPER-I

INTRODUCTION AND SCOPE OF MICROBIOLOGY

1. Answer any ***five*** questions from the following: 1×5 = 5
   (a) Define numerical aperture.
   (b) What is virion?
   (c) Define SCP.
   (d) What is bioremediation?
   (e) What is mutualism?
   (f) What is an epitope?
   (g) Name two microorganisms that ferment lactose in milk.
   (h) Define tyndallization.

2. Answer any ***three*** questions from the following: 5×3 = 15
   (a) Give a comparative account of different classes of immunoglobulins. 5
   (b) Discuss, in detail, about the aerobic fermentors with proper diagram. 5
   (c) State the details of reproduction in amoeba. 5
   (d) Discuss about the differences between SEM and TEM. 5
   (e) Write a short note on numerical taxonomy. 5

3. Answer any ***two*** questions from the following: 10×2 = 20
   (a) What are Xenobiotics? Why xenobiotic are recalcitrant? Discuss the biodegradation of aliphatic hydrocarbon. 2+2+6
   (b) Write short notes on: 5+5
      (i) Bt toxin used as biopesticides
      (ii) Rhizobium used as biofertilizers.

(c) State the principle of sterilization by moist heat and HEPA filtration. 5+5

(d) Write a brief account on the contribution of Edward Jenner and Martinus W. Beijerinck. 5+5

PAPER-II

MICROBIAL METABOLISM

1. Answer any ***five*** questions from the following: 1×5 = 5

(a) Define chemolithotrophy.

(b) What are the end products of alcohol fermentation?

(c) Name the inhibitors of ETC.

(d) Name one bacterium that can perform denitrification process.

(e) What is batch culture?

(f) What is assimilative metabolism?

(g) What is substrate level phosphorylation?

(h) What is chemosynthesis?

2. Answer any ***three*** questions from the following: 5×3 = 15

(a) Write down the effect of solute and water activity on bacterial growth. 5

(b) Trace the biochemical pathway leading to formation of ethanol from glucose. 5

(c) Write a note on symport and antiport. 5

(d) What are the differences between EMP and ED pathway? 5

(e) Explain in detail the process of methanogenesis. 5

3. Answer any ***two*** questions from the following: 10×2 = 20

(a) With appropriate examples, explain nitrification and ammonification process. 5+5

(b) Suppose a food sample contains 10^3 cells. After six hours, the numbers of cell stand to 10^6 cells. Calculate — 6+4

(i) generation time

(ii) specific growth rate

(iii) number of generation.

State the difference between continuous and batch culture.

(c) Compare and contrast between oxygenic and anoxygenic photosynthesis. 5+5

(d) What is Pasteur effect? Briefly describe linear and branched fermentation pathway with suitable example. 2+(4+4)

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