



'সমানো মন্ত্র: সমিতি: সমানী'

**UNIVERSITY OF NORTH BENGAL**  
B.Sc. Honours 6th Semester Examination, 2023

**DSE-P3-MICROBIOLOGY**

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.*

**The question paper contains two parts DSE-5 and DSE-6.  
The candidates are required to answer any *one* from the *two* parts  
Candidates should mention it clearly on the Answer Book.**

**DSE-5 (BIOSAFETY AND INTELLECTUAL PROPERTY RIGHTS (THEORY))**

1. Answer any **five** of the following questions: 1×5 = 5
- (a) What is Copyright?
  - (b) What is LMOs?
  - (c) What is Biosafety Level?
  - (d) Define Patent.
  - (e) Write down the full form of IBSC.
  - (f) What is a trademark?
  - (g) Why is Risk analysis important?
  - (h) What is bioethics?
2. Answer any **three** of the following questions: 5×3 = 15
- (a) Describe briefly the functions of AERB. 5
  - (b) What is a patent licensing and agreement? Explain the three types of patent licensing and agreement. 2+3
  - (c) What are Geographical Indications? Write down its importance. 2+3
  - (d) State the comparison between: 2½+2½
    - (i) BSL I and BSL III
    - (ii) Risk Assessment and Risk Management.
  - (e) Write a short note on: 2½+2½
    - (i) Duties of Patent Owner
    - (ii) Industrial Design and Rights.
3. Answer any **two** of the following: 10×2 = 20
- (a) What is Intellectual Property Right? Discuss its importance. Write a short note on World Intellectual Property Organization. 3+4+3

- (b) Write down the full form of RCGM. Discuss the various role of RCGM for GMO applications in food and agriculture. 2+8
- (c) Explain Cartagena Protocol. Discuss in detail the Biosafety Guidelines and regulations. 5+5
- (d) Write a note on: 5+5
- (i) Role of Madrid Agreement
- (ii) Role of Hague Agreement.

**DSE-6 (INHERITANCE BIOLOGY (THEORY))**

1. Answer any **five** of the following: 1×5 = 5
- (a) What is incomplete dominance?
- (b) What is infectious heredity?
- (c) What is expressivity in Mendelian genetics?
- (d) What are pseudoalleles?
- (e) What is meant by Karyotyping?
- (f) What is QTL Mapping?
- (g) Explain inversion in chromosome structure variation.
- (h) What is the function of centromere?
2. Answer any **three** of the following: 5×3 = 15
- (a) Discuss the importance of *Caenorhabditis elegans* as a model organism in genetic analysis. 5
- (b) Explain transposition and site-specific recombination with proper diagram.  $2\frac{1}{2} + 2\frac{1}{2}$
- (c) Give a brief account of chloroplast mutation in *Chlamydomonas*. 5
- (d) Explain the concept of Euchromatin and Heterochromatin.  $2\frac{1}{2} + 2\frac{1}{2}$
- (e) Discuss the molecular mechanism of crossing over. 5
3. Answer any **two** of the following: 10×2 = 20
- (a) Give an account of normal and abnormal karyotypes of human chromosomes. What is the role of Kappa particles in *Paramecium*? Explain lampbrush chromosome with diagram. 4+3+3
- (b) Discuss the Mendel's Laws of inheritance. What is the difference between complete and incomplete penetrance? 6+4
- (c) Write short notes on: 5+5
- (i) Down Syndrome
- (ii) Chromosomal theory of inheritance.
- (d) Discuss the process of homologous recombination with the help of Holliday model. 10

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