'समानो मन्त्रः समितिः समानी'

UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 5th Semester Examination, 2023

DSE-P1-MICROBIOLOGY

Time Allotted: 2 Hours | Full Marks: 40

The figures in the margin indicate full marks.

The question paper contains two parts DSE1-Paper-I and DSE1-Paper-II.
The candidates are required to answer any *one* from the two parts.
Candidates should mention it clearly on the Answer Book.

DSE1-PAPER-I

INSTRUMENTATION AND BIOTECHNIQUES

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

   (a) What is meant by resolution of a microscope?

   (b) Define hyperchromicity.

   (c) What do you understand by R_f value in TLC?

   (d) What is an auxochrome? Give an example.

   (e) Define the isoelectric point of a protein.

   (f) Name a dye used in SDS-Page for the visualisation of a protein.

   (g) Define optical density.

   (h) What is sedimentation coefficient?

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

   (a) State the principle and applications of differential centrifugation. 5

   (b) Explain the principle and applications of size-exclusion chromatography. 5

   (c) Write a short note on Thin Layer Chromatography (TLC). 5

   (d) Describe analysis of biomolecules using UV-visible spectrophotometry.

   (e) What is Zymography? Explain its types and applications. 5

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

   (a) Describe the principle of discontinuous gel electrophoretic. How Can you determine the molecular weight of a monomeric protein with the help of SDS-PAGE? 6+4

   (b) Describe the working principle of Phase-Contrast Microscope with a proper ray diagram. Mention the applications of Phase-Contrast Microscope. 7+3

(c) Explain the working principle of affinity chromatography with the help of a suitable diagram. Write down its applications. 7+3

(d) Write notes on: 5+5

(i) Dark field microscopy

(ii) Colorimetry.

DSE1-PAPER-II

PLANT PATHOLOGY

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

(a) What is epidemic disease? Give examples.

(b) What is necrosis?

(c) Define the term 'damping-off'.

(d) What is Horizontal resistance?

(e) What is hypertrophy?

(f) What are sclerotia?

(g) What are obligate saprotrophs? Give examples.

(h) What is an obligate parasite? Give examples.

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

(a) Discuss the role of quarantine in plant disease management.

(b) Define pathotoxin. Describe their characteristics features with suitable examples.

(c) Differentiate between SAR and ISR.

(d) State Koch's postulates. In which case it is not accepted?

(e) Give an outline of classification of plant diseases.

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

(a) Discuss the role of phytoalexins in plant defence mechanism. Give a brief account on mode of action of systemic fungicides.

(b) Discuss in brief the biochemical defence mechanism in host plant after pathogenic infection.

(c) Describe the different types of induced structural defence mechanisms in host plants. 10

(d) Illustrate the pre-penetration mechanism of infection during host-parasite interaction with diagram. 10

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