



UNIVERSITY OF NORTH BENGAL
B.Sc. Honours 2nd Semester Examination, 2021

GE2-BOTANY

Full Marks: 40

ASSIGNMENT

The figures in the margin indicate full marks.

The question paper contains Paper-GE-1, Paper-GE-2, Paper-GE-3, Paper-GE-4, Paper-GE-5 and Paper-GE-6. Candidates are required to answer any *one* from the *six* papers and they should mention it clearly on the Answer Book.

PAPER-GE-1

**BIODIVERSITY
(MICROBES, ALGAE, FUNGI AND ARCHEGONIATES)**

Answer any *four* of the following questions each within 300 words 10×4 = 40

1. Briefly discuss the life cycle of *Rhizopus* with suitable diagram. 10
2. Define triphasic life cycle and describe the post-fertilization changes in *Polysiphonia*, with suitable sketches. 10
3. Describe with suitable diagram, the lytic cycle of bacteriophage. How it differs from the lysogenic cycle? 10
4. Compare the reproductive structure of *Marchantia* and *Funaria*, with suitable diagrams. 10
5. Discuss ecological and economical importance of pteridophytes. Mention xerophytic characters of *Equisetum*. 10

PAPER-GE-2

PLANT ECOLOGY AND TAXONOMY

Answer any *four* of the following questions each within 300 words 10×4 = 40

1. Distinguish between artificial, natural and phylogenetic system of classifications. Give a brief outline of Bentham and Hooker's system of plant classification and also mention its merits and demerits. 10
2. Give the salient features, floral formula and floral diagram of family Asteraceae. Mention the economic importance of the family. 10

3. Briefly describe the energy flow in the ecosystem, with a schematic diagram. 10
4. What do you mean by climax community? Describe the process of hydrosere. 10
5. Write notes on: 10
 - (i) Ecological Pyramid
 - (ii) Principles of priority.

PAPER-GE-3

PLANT ANATOMY AND EMBRYOLOGY

Answer any four of the following questions each within 300 words 10×4 = 40

1. Give a brief account of location and function of apical meristem. Point out the major differences between parenchyma, collenchyma and sclerenchyma tissues in plants. 10
2. Discuss secondary growth observed in dicotyledonous stem. How secondary growth is different in monocot stem from dicot stem? 10
3. Discuss in detail, the different components of phloem tissue. What do you mean by polyembryony? 8+2
4. Describe the structure of ideal angiospermic ovule with suitable diagram. Mention the fate of nucellus in seed. 10
5. Write notes on: 10
 - (i) Mechanisms of pollination
 - (ii) Tunica Corpus Theory.

PAPER-GE-4

PLANT PHYSIOLOGY AND METABOLISM

Answer any four of the following questions each within 300 words 10×4 = 40

1. Discuss the pressure-flow model of translocation in the phloem. Write the available evidences for confirming the predictions of pressure-flow model. 10
2. Describe in detail the biological nitrogen fixation in root nodules of plants. 10
3. What are the different forms of transpiration in plants? Give the various factors which affect the process of transpiration. What is the significance of transpiration in plant system? 10
4. Give a brief account on C₃ pathway of carbon fixation in plants. 10

5. Distinguish between: 10
- (i) Photosystem I and Photosystem II
 - (ii) Active and Passive transport
 - (iii) Short Day Plants and Long Day Plants
 - (iv) Macronutrient and Micronutrients.

PAPER-GE-5

ECONOMIC BOTANY AND PLANT BIOTECHNOLOGY

Answer any four of the following questions each within 300 words 10×4 = 40

1. Write explanatory notes on the application of embryo culture and micropropagation. 10
2. Discuss about the concept of centres of origin of crop plants. Mention the importance of Vavilov's work. 10
3. Give an account of botanical names, family, plant parts used and uses of clove and cotton. 10
4. Give an account on the origin, morphology and uses of wheat. 10
5. Discuss in detail southern blotting technique with suitable diagram. How this technique differs from that of northern and western blot techniques? 10

PAPER-GE-6

ENVIRONMENTAL BIOTECHNOLOGY

Answer any four of the following questions each within 300 words 10×4 = 40

1. Discuss in detail the molecular techniques involved in bioremediation process. 10
2. Discuss two important global environmental problems in detail and mention biotechnological approaches to combat those problems. 10
3. What is the difference between aerobic and anaerobic processes in sewage treatment? How do aerobic waste water treatment systems work? What are the benefits of aerobic waste water treatment? 10
4. Write short notes on: 10
 - (i) Cause and consequences of Acid Rain.
 - (ii) Wildlife Protection Act, 1972
5. Discuss the biotechniques used for air pollution abatement and odour control. 10

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