UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 4th Semester Examination, 2021

GE-BOTANY

Full Marks: 40

ASSIGNMENT

The figures in the margin indicate full marks.

The question paper contains Paper-GE-I, Paper-GE-II, Paper-GE-III, Paper-GE-IV, Paper-GE-V and Paper-GE-VI. Candidates are required to answer any *one* from the *six* courses and they should mention it clearly on the Answer Book.

PAPER-GE-I

BIODIVERSITY

(MICROBES, ALGAE, FUNGI AND ARCHEGONIATE)

Answer any *four* questions from the following 10×4 = 40

1. Draw and describe the structure of a DNA virus and an RNA virus. 10

2. Discuss the range of thallus structure in algae with suitable examples and sketches. 10

3. What is mycorrhiza? Describe different types of mycorrhiza with suitable sketches and mention their significance. 2+6+2

4. Compare the vegetative and reproductive structure of *Marchantia* and *Funaria*. 5+5

5. Write notes on: 5×2
   (i) Heterospory (ii) *Cycas* leaflet.

PAPER-GE-II

PLANT ECOLOGY AND TAXONOMY

Answer any *four* questions from the following 10×4 = 40

1. Briefly describe the energy flow in the ecosystem. 10

2. State the functions of Herbarium. Define heliophilous and heliophobous plants with examples. Briefly describe the adaptive features of xerophytes. 10

3. What do you mean by natural system of plant classification? Give a brief outline of Bentham and Hooker's system of plant classification and also mention its merits and demerits. 10

4. What do you mean by taxonomic hierarchy? Define flora with example. State the diagnostic features of family Solanaceae and Lamiaceae. 10

5. Write notes on: 10
(i) Ecological Pyramid (ii) Typification.

PAPER-GE-III

PLANT ECOLOGY AND TAXONOMY

Answer any *four* questions from the following 10×4 = 40

1. Discuss intra-stellar secondary growth observed in dicotyledonous stem. 10

2. Describe the structure of ideal angiospermic ovule with suitable diagram. Briefly describe the "Tunica Corpus" theory. 10

3. 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

4. Define endosperm and nucellus. Describe the process of double fertilization in flowering plants with suitable diagram. 10

5. Discuss in detail, the different components of phloem tissue. What do you mean by polyembryony? 10

PAPER-GE-IV

PLANT PHYSIOLOGY AND METABOLISM

Answer any *four* questions from the following 10×4 = 40

1. Describe different steps of C_3 pathway of carbon fixation in plants. 10

2. What is EMP pathway? Trace the biochemical reactions involved in this process. 1+9

3. Describe in detail the biological nitrogen fixation in root nodules of plants. 10

4. 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? 4+4+2

5. Explain the physiological roles of any two growth regulators in plant. 10

PAPER-GE-V

ECONOMIC BOTANY AND PLANT BIOTECHNOLOGY

Answer any *four* questions from the following 10×4 = 40

1. Schematically represent the processing of tea giving a note on its uses. 10

2. What is DNA fingerprinting? Compare between RAPD and RFLP techniques with proper diagram. 10

3. Discuss about the origin and uses of wheat. 10

4. Discuss in detail southern blotting technique with suitable diagram. How this technique differs from that of northern and western blot techniques? 10

5. Discuss briefly the process of embryo culture. Mention its significance. 10

PAPER-GE-VI

ENVIRONMENTAL BIOTECHNOLOGY

Answer any *four* questions from the following 10×4 = 40

1. Discuss two important global environmental problems in detail and mention biotechnological approaches to combat those problems. 10

2. 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

3. Discuss in detail the techniques involved in bioremediation process. 10

4. Discuss the methods used for controlling air pollution. 10

5. Write short notes on: 10

   (i) Environmental ethics (ii) National Environmental Policy, 2006

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