



UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 1st Semester Examination, 2020

GE-BOTANY

Full Marks: 40

ASSIGNMENT

The figures in the margin indicate full marks.

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

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:
i Heterospory
ii *Cycas* leaflet 5×2

GE-2

PLANT ECOLOGY AND TAXONOMY

Answer any *four* questions from the following

10×4 = 40

1. 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. 2+8

2. What do you mean by taxonomic hierarchy? Define flora with example. State the diagnostic features of family Solanaceae and Lamiaceae 1+3+6
3. Briefly describe the energy flow in the ecosystem. 10
4. State the functions of Herbarium. Define heliophilous and heliophobic plants with examples. Briefly describe the adaptive features of xerophytes. 4+2+4
5. Write notes on: 5×2
 - i. Ecological Pyramid
 - ii. Typification

GE-3

PLANT ANATOMY AND EMBRYOLOGY

- Answer any four of the following questions each within 300 words** 10×4 = 40
1. Compare monocot embryo with dicot embryo. Write a short note on double fertilization? 6+4 = 10
 2. Describe the process of Megagametogenesis with proper diagram. Write a short note on different types of polyembryony. 6+4 = 10
 3. Discuss in detail the different components of phloem tissue. What is quiescent center? 8+2 = 10
 4. Write a note on secondary growth in the intra stellar region of dicotyledonous stem. 10
 5. Differentiate between Dicotyledonous stem and Dicotyledonous root. Discuss the adaptive characteristics for cross pollination. 5+5 = 10

GE-4

PLANT PHYSIOLOGY AND METABOLISM

- Answer any four questions from the following** 10×4 = 40
1. Describe in detail the biological nitrogen fixation in root nodules of plants. 10
 2. Explain the physiological roles of any two growth regulators in plant. 10

3. What is EMP pathway? Trace the biochemical reactions involved in this process. 1+9
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. Describe different steps of C₃ pathway of carbon fixation in plants. 10

GE-5

ECONOMIC BOTANY AND PLANT BIOTECHNOLOGY

Answer any *four* questions from the following

10×4 = 40

1. Discuss about the origin and uses of wheat. 10
2. Schematically represent the processing of tea giving a note on its uses. 10
3. What is DNA fingerprinting? Compare between RAPD and RFLP techniques with proper diagram. 2+8
4. Discuss in detail southern blotting technique with suitable diagram. How this technique differs from that of northern and western blot techniques? 8+2
5. “Embryo culture has immense application in the economic development of a developing country” – justify the statement along with a schematic representation of the technique. 10

GE-6

ENVIRONMENTAL BIOTECHNOLOGY

Answer any *four* questions from the following

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? 2+6+2

4. Write short notes on: 2 $\frac{1}{2}$ × 4
- (i) Environmental ethics
 - (ii) National environmental policy, 2006
 - (iii) Chipko movement
 - (iv) Kyoto protocol, 1997
5. Discuss the biotechniques used for air pollution abatement and odour control. 10

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