



'সমানো মন্ত্র: সমিতি: সমানী'

**UNIVERSITY OF NORTH BENGAL**  
B.Sc. Honours 1st Semester Examination, 2022

**GE1-P1-BOTANY**

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.*

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

**PAPER-1**

**BIODIVERSITY**

**GROUP-A**

1. Answer any *five* questions from the following: 1×5 = 5
- (a) What is peristome teeth? What is its function?
  - (b) What is wanderplasm?
  - (c) Name one economically important fungus.
  - (d) What is sulphur shower?
  - (e) Define sorus.
  - (f) Why is *Cycas* called living fossil?
  - (g) Name one RNA virus.
  - (h) What is coenocyte?

**GROUP-B**

2. Answer any *three* questions from the following: 5×3 = 15
- (a) Write a short note on ecological importance of bryophytes. 5
  - (b) Briefly describe the internal structure of *Cycas* leaflet. 5
  - (c) Explain the asexual reproduction in *Vaucheria*. 5
  - (d) 'Bryophytes are amphibians of plant kingdom' — Justify the statement. 5
  - (e) Differentiate between: 2½+2½
    - (i) Vallecular canal and Carinal canal
    - (ii) Long shoot and Dwarf shoot of *Pinus*.

**GROUP-C**

3. Answer any *two* questions from the following: 10×2 = 20
- (a) What is stele? Give an account of stelar evolution of pteridophytes with suitable diagram. 2+8
- (b) Describe in detail, the process of bacterial conjugation with suitable diagrams. 10
- (c) Write short notes on: 5+5
- (i) Life cycle of *Rhizopus*
- (ii) Different types of spores in *Puccinia*.
- (d) Write down the economic importance of algae. Compare algae and bryophyte on the basis of sex organ. 5+5

**PAPER-2**

**PLANT ECOLOGY AND TAXONOMY**

**GROUP-A**

1. Answer any *five* questions from the following: 1×5 = 5
- (a) What is syntype?
- (b) What is age pyramid?
- (c) Define endemism.
- (d) Name the largest Herbarium of India.
- (e) What do you mean by climax community?
- (f) What is documentation?
- (g) Name one widely known Indian Botanical Garden.
- (h) Give the full form of Hook. f. in reference to author citation.

**GROUP-B**

2. Answer any *three* questions from the following: 5×3 = 15
- (a) “The pyramid of energy is always upright” — Explain. 5
- (b) Describe with examples how secondary metabolites help in solving taxonomic problem. 5
- (c) Write short notes on: 2½+2½
- (i) Food web
- (ii) Binomial Nomenclature.
- (d) Write a note on vegetation analysis through quadrat method. 5
- (e) What is valid publication? Mention the criteria to be fulfilled by a name to be valid. 2+3

**GROUP-C**

3. Answer any *two* of the following questions: 10×2 = 20
- (a) What is plant succession? Discuss how succession takes place in a barren land. What is secondary succession? 2+6+2
- (b) What is natural system of classification? How does it differ from a phylogenetic classification? Mention the merits and demerits of Bentham and Hooker's system of classification. 2+5+3
- (c) Describe the Nitrogen cycle in nature with proper labeled diagram. 10
- (d) What is a taxonomic key? With the help of suitable example explain how single access key can be used in the identification of plants. 2+8

**PAPER-3**

**ANATOMY AND EMBRYOLOGY**

**GROUP-A**

1. Answer any *five* questions from the following: 1×5 = 5
- (a) What is interfascicular cambium?
- (b) Which phloem cells are responsible for transportation of food materials?
- (c) What is campylotropous ovule?
- (d) What are synergids?
- (e) What is Geitonogamy?
- (f) What is the function of quiescent centre?
- (g) What do you understand by double fertilization?
- (h) What type of vascular bundles are found in monocot stem?

**GROUP-B**

2. Answer any *three* from the following questions: 5×3 = 15
- (a) Describe the different types of xylem tissues with a neat diagram. 5
- (b) Describe the structure of a typical monocotyledonous embryo. 5
- (c) Write down the anatomical adaptations of leaf of xerophytes. 5
- (d) Write down the importance and application of apomixis. 2½+2½
- (e) Distinguish between: 2½+2½
- (i) Monocot root and Dicot root
- (ii) Early wood and Late wood.

**GROUP-C**

3. Answer any *two* questions from the following: 10×2 = 20
- (a) Discuss the ‘Tunica-Corpus’ theory regarding the structure and development of shoot apical meristem with a diagram. Write down the significance of this theory. 7+3
- (b) Describe the different types of endosperm development in angiosperms with suitable examples. 10
- (c) Differentiate between self and cross pollination. Discuss the contrivances of cross pollination. 4+6
- (d) Write a short note on: 5+5
- (i) Rhytidome
- (ii) Growth ring.

**PAPER-4**

**PLANT PHYSIOLOGY AND METABOLISM**

**GROUP-A**

1. Answer any *five* questions from the following: 1×5 = 5
- (a) Water absorption by plant does not take place under water logged condition — Why?
- (b) Where is OEC located?
- (c) What is the principal food material translocated through phloem tissue?
- (d) Name one long day plant and one short day plant.
- (e) What are nif genes?
- (f) Name one mineral element that take part in oxidation-reduction reaction.
- (g) What is Kranz anatomy?
- (h) Define water potential.

**GROUP-B**

2. Answer any *three* questions from the following: 5×3 = 15
- (a) Discuss about different factors affecting transpiration. 5
- (b) Describe the components of PS-I. How does it differ from PS-II? 3+2
- (c) Compare photophosphorylation and oxidative phosphorylation. 5
- (d) Define Co-enzyme. Discuss the different types of enzyme inhibitors. 2+3
- (e) Discuss the significance of biological nitrogen fixation. Name two denitrifying micro-organism. 3+2

**GROUP-C**

3. Answer any *two* questions from the following: 10×2 = 20
- (a) What are phytochromes? Write down the important functions of phytochrome in plant. Name two naturally occurring and two synthetic auxins. 2+2+3+3
- (b) What is secondary active transport? Give two examples. With illustration describe the cytochrome pump theory. 2+2+6
- (c) Give the composition of phloem sap. With the help of pressure flow model explain phloem loading and unloading. 3+7
- (d) What is the fate of electron in cyclic photophosphorylation? With detail structure discuss the Calvin Cycle. 2+8

**PAPER-5**

**ECONOMIC BOTANY AND PLANT BIOTECHNOLOGY**

**GROUP-A**

1. Answer any *five* questions from the following: 1×5 = 5
- (a) Define totipotency.
- (b) Write down the botanical name of Gram.
- (c) Write the full form of PCR.
- (d) Define androgenesis.
- (e) What is the morphology of edible part of clove?
- (f) Name one species of Wheat from old world.
- (g) What do you understand by the term 'micropropagation'?
- (h) Name a species of cotton cultivated in India.

**GROUP-B**

2. Answer any *three* questions from the following: 5×3 = 15
- (a) Write down the scientific name, family, parts used and uses of: ( $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + 1$ ) × 2
- (i) Soyabean (ii) Ground nut
- (b) Write a note on the origin of wheat. 5
- (c) Write down the application of haploid culture in agriculture. 5
- (d) Write the full form of ELISA. Write down its application. 1+4
- (e) Mention different techniques of Molecular diagnosis of human diseases. 5

**GROUP-C**

3. Answer any *two* questions from the following: 10×2 = 20
- (a) What do you mean by primary and secondary Centre of Origin? Describe in detail Vavilov's Centre of Origin of Crop plants. 1+1+8
- (b) Write down the botanical name and family of a beverage you have studied. Describe in detail of its processing. 1+1+8
- (c) Briefly describe the PCR techniques. How RFLP differs from RAPD? 8+2
- (d) Write an account on embryo-culture. Mention its applications. 6+4

**PAPER-6**

**ENVIRONMENTAL BIOTECHNOLOGY**

**GROUP-A**

1. Answer any *five* questions from the following: 1×5 = 5
- (a) Name any two green house gases.
- (b) Define Xenobiotics.
- (c) What is biomagnification?
- (d) Write down main features of Kyoto Protocol.
- (e) When was Wildlife Protection Act implemented in India?
- (f) What is Ramsar Convention?
- (g) Give any two examples of pesticides.
- (h) What is Gandhamardan Movement?

**GROUP-B**

2. Answer any *three* questions from the following: 5×3 = 15
- (a) Write a note on bioleaching. 5
- (b) Describe different types of Xenobiotics. 5
- (c) Write a note on Convention of Biological diversity. 5
- (d) Write down the role of NGOs in bringing environmental awareness and education in society. 5
- (e) When and why was Narmada Bachao Andolan launched? 5

**GROUP-C**

3. Answer any *two* from the following questions: 10×2 = 20
- (a) Enumerate the major global environmental problems with special reference to Ozone depletion, its causes and control measures. 5+5
- (b) What are major roles of immobilized cells in treatment of toxic compounds with reference to biopesticides, bioleaching and biosensors? 10
- (c) Define the term 'sustainable development'. What is environmental ethics? Write a note on schemes for waste water treatment from tannery industry. 2+3+5
- (d) Discuss about the role of public participation for environmental protection with special reference to Chipko Movement. Write down the objectives of National Environmental Policy (2006). 7+3

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