



'সমানো মন্ত্র: সমিতি: সমানী'

UNIVERSITY OF NORTH BENGAL
B.Sc. Honours 1st Semester Examination, 2023

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 (MICROBES, ALGAE, FUNGI AND ARCHEGONIATE)

GROUP-A

1. Answer any *five* questions from the following: 1×5 = 5
- (a) What is peplomer?
 - (b) What is synzoospore?
 - (c) What is dolipore septum?
 - (d) Name one dye-yielding lichen.
 - (e) What are eusporangiate fern?
 - (f) What is transfusion tissue?
 - (g) Name one ligulate heterosporous pteridophyte.
 - (h) Define Carinal Canal.

GROUP-B

2. Answer any *three* questions from the following: 5×3 = 15
- (a) Define Lytic Cycle. Differentiate it with lysogenic cycle. 2+3
 - (b) Briefly discuss, the different types of spore forms found in the life cycle of *Puccinia*. 5
 - (c) Discuss economical and ecological importance of *Sphagnum*. 5
 - (d) Describe different types of stele found in pteridophytes with proper examples. 5
 - (e) Describe the anatomical features of needle leaves of *Pinus*. 5

GROUP-C

3. Answer any *two* questions from the following: 10×2 = 20
- (a) Describe the process of transformation and conjugation in bacteria. Name two beneficial bacteria. 8+2
 - (b) Describe the economic importance of algae. 10

- (c) Differentiate Ascomycota and Basidiomycota. Describe the structure and mode of development of basidiocarp in *Agaricus*. 3+7
- (d) Write notes on: $2\frac{1}{2} \times 4 = 10$
- (i) Phage Virus
 - (ii) Mycorrhizae
 - (iii) Seed habit
 - (iv) Economic importance of Gymnosperm.

PAPER-2

PLANT ECOLOGY AND TAXONOMY

GROUP-A

1. Answer any **five** questions from the following: $1 \times 5 = 5$
- (a) Name one important herbarium of India.
 - (b) Define numerical taxonomy.
 - (c) Give the full form of ICN.
 - (d) Why is energy flow in an ecosystem important?
 - (e) Name one plant species endemic to India.
 - (f) What is sporopollenin?
 - (g) What is food-web?
 - (h) What is principle of priority?

GROUP-B

2. Answer any **three** questions from the following: $5 \times 3 = 15$
- (a) Write down the adaptive features of Xerophytes with proper examples. 5
 - (b) What is binomial system of nomenclature? Write down the elementary rules of binomial nomenclature. 2+3
 - (c) What is biogeochemical cycle? Mention its significance. 2+3
 - (d) Write a note on author citation and its importance in nomenclatural practice. 5
 - (e) Discuss the different types of soil based on texture. 5

GROUP-C

3. Answer any **two** questions from the following: $10 \times 2 = 20$
- (a) What is plant succession? Discuss how succession takes place in barren land. 2+8
 - (b) What is phytochemistry? Discuss in detail citing specific examples, how secondary metabolites are helpful in solving taxonomic problems. 2+6+2
 - (c) How is phylogenetic classification different from natural system of classification? What are the demerits of Engler and Prantl's classification? Give an outline of Engler and Prantl's classification. 4+3+3
 - (d) Write short notes on: $5 \times 2 = 10$
 - (i) Taxonomic key
 - (ii) Botanical Garden.

PAPER-3
PLANT ANATOMY AND EMBRYOLOGY

GROUP-A

1. Answer any *five* questions from the following: 1×5 = 5
- (a) Define Pollinia.
 - (b) What is annual ring?
 - (c) What is Rhytidome?
 - (d) What is Tyloses?
 - (e) Give an example of Ornithophilous flower.
 - (f) Define sap wood.
 - (g) What is the function of cork cambium?
 - (h) Mention the ploidy level of endosperm in angiosperm.

GROUP-B

2. Answer any *three* questions from the following: 5×3 = 15
- (a) Compare the anatomical features between monocot and dicot stem. 5
 - (b) Give a brief account of morphological and anatomical features related to hydrophytic adaptation. 5
 - (c) Distinguish between: 2½ × 2 = 5
 - (i) Cleistogamy and Chasmogamy
 - (ii) Polygonous type and Oenothera type of Embryo sac.
 - (d) What is polyembryony? Write any three significance of polyembryony in plants. 2+3
 - (e) Differentiate between: 2½ × 2 = 5
 - (i) Heartwood and Sapwood
 - (ii) Parenchyma and Collenchyma.

GROUP-C

3. Answer any *two* questions from the following: 10×2 = 20
- (a) What do you mean by secondary growth? Discuss the important events occur during secondary growth in dicot stem with suitable illustrations. 2+8
 - (b) Describe briefly the different components of Vascular tissue with neat sketch. 10
 - (c) What are stomata? Discuss different types of stomata found in dicot plants. 2+8
 - (d) Write short notes on: 2½ × 4 = 10
 - (i) Apospory
 - (ii) Anemophily
 - (iii) Apomixis
 - (iv) Embryo Sac.

PAPER-4
PLANT PHYSIOLOGY AND METABOLISM

GROUP-A

1. Answer any *five* questions from the following: 1×5 = 5
- (a) Name one long day plant and one short day plant.
 - (b) What is Vernalization?
 - (c) Name two symbiotic N₂-fixing bacteria.
 - (d) Define Osmosis.
 - (e) Write the full form of CAM.
 - (f) Name two photosynthetic pigments.
 - (g) What is Ammonification?
 - (h) What are Co-factors?

GROUP-B

2. Answer any *three* questions from the following: 5×3 = 15
- (a) What is transpiration? What are the factors affecting transpiration? 1+4
 - (b) Write the significance of Biological Nitrogen Fixation. Name two denitrifying bacteria. 3+2
 - (c) Mention the physiological role of Auxin. 5
 - (d) Define enzyme. Discuss different types of enzyme inhibitions. 1+4
 - (e) Define essential elements. Discuss the role of essential elements in plant nutrition. 1+4

GROUP-C

3. Answer any *two* questions from the following: 10×2 = 20
- (a) What are the major components of phloem sap? Describe the pressure-flow model explaining movement of sap through phloem. What do you understand by phloem loading? 2+6+2
 - (b) What is RQ? Schematically represent the various steps involve in Glycolysis. 2+8
 - (c) What do you mean by photolysis of water? Discuss the 'Z'-scheme model of electron transport during light reaction of photosynthesis. 2+8
 - (d) Write short notes on: 5×2 = 10
 - (i) Glyoxylate Cycle
 - (ii) Difference between C₃ and C₄ cycle.

PAPER-5
ECONOMIC BOTANY AND PLANT BIOTECHNOLOGY

GROUP-A

1. Answer any *five* questions from the following: 1×5 = 5
- (a) What is the anatomical nature of jute fibre?
 - (b) What is the major source of coir?
 - (c) What is the full form of RAPD?
 - (d) What is the source of Taq Polymerase?
 - (e) What is ELISA?
 - (f) Name one oil yielding plant.
 - (g) Write the Botanical name and family of Clove.
 - (h) Define Hybridoma.

GROUP-B

2. Answer any *three* questions from the following: 5×3 = 15
- (a) What is DNA sequencing? How does Sanger's method of DNA sequencing differ from that of Maxam-Gilbert technique? 2+3
 - (b) Define Totipotency. Briefly describe the process of embryo culture. 1+4
 - (c) What is artificial seed? Differentiate between Androgenesis and Gynogenesis. 2+3
 - (d) Mention botanical name, family, plant parts used of the following: 2½+2½
 - (i) Cotton
 - (ii) Black pepper.
 - (e) Discuss the methods used for tea processing. 5

GROUP-C

3. Answer any *two* questions from the following: 10×2 = 20
- (a) Define plant tissue culture. Mention the significance and possible roles of micro-propagation in crop improvement. 2+8
 - (b) Define cereals. Briefly discuss the origin of wheat, morphology and uses. 1+3+3+3
 - (c) What is monoclonal antibody? Discuss the process of monoclonal antibody production through hybridoma development. Mention applications of these antibodies. 2+5+3
 - (d) Write short notes on: 2½×4 = 10
 - (i) DNA finger printing
 - (ii) Southern blotting
 - (iii) Reverse transcriptase
 - (iv) RTPCR.

PAPER-6
ENVIRONMENTAL BIOTECHNOLOGY

GROUP-A

1. Answer any *five* questions from the following: 1×5 = 5
- (a) What is ozone depletion?
 - (b) Name any two green house gases.
 - (c) Mention one role of NGO in environmental awareness.
 - (d) What is e-waste?
 - (e) Write down the full form of CFC.
 - (f) Define Biomagnification.
 - (g) What is Xenobiotics?
 - (h) Write down two effects of acid rain.

GROUP-B

2. Answer any *three* questions from the following: 5×3 = 15
- (a) What are various schemes for treatment of water? Explain. 5
 - (b) Write down the causes of green house effect and acid rain due to anthropogenic activities. $2\frac{1}{2}+2\frac{1}{2}$
 - (c) What are the salient features of Wildlife Protection Act? 5
 - (d) Write down the role of biopesticides and biosensors in treatment of toxic compounds. $2\frac{1}{2}+2\frac{1}{2}$
 - (e) Write notes on: $2\frac{1}{2}+2\frac{1}{2}$
 - (i) BOD
 - (ii) Silent Valley Movement.

GROUP-C

3. Answer any *two* questions from the following: 10×2 = 20
- (a) Write a detail note on microbiological waste water management. 10
 - (b) Define environmental pollution. What are its different sources? Write a brief note on fate of pollutants in the environment. 1+3+6
 - (c) What is the difference between aerobic and anaerobic processes in sewage treatment? How do aerobic waste water treatment systems work? Write down its benefits. 2+6+2
 - (d) Write short notes on: $2\frac{1}{2} \times 4 = 10$
 - (i) Narmada Bachao Andolan
 - (ii) Chipko Movement
 - (iii) Water Pollution Prevention Control Act 1974
 - (iv) Bioconcentration.

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