



‘समानो मन्त्रः समितिः समानी’

UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 3rd Semester Examination, 2022

SEC1-P1-BOTANY

Time Allotted: 2 Hours

Full Marks: 60

The figures in the margin indicate full marks.

The question paper contains Paper-1, Paper-2, Paper-3, Paper-4, Paper-5, Paper-6, Paper-7, Paper-8 and Paper-9. Candidates are required to answer any *one* from *nine* papers and they should mention it clearly on the Answer Book.

PAPER-1

BIOFERTILIZER

GROUP-A

1. Answer any *four* questions from the following: 3×4 = 12
- (a) Give the full form of VAM. Name two species of VAM. 1+2
- (b) Name two free-living nitrogen-fixing microbes. $1\frac{1}{2}+1\frac{1}{2}$
- (c) Name two endophytic cyanobacteria used in rice cultivation. $1\frac{1}{2}+1\frac{1}{2}$
- (d) What is vermicompost? Name one organism used in producing vermicompost. 2+1
- (e) What is actinomycorrhizal symbiosis? Give one example of actinomycorrhiza. 2+1
- (f) What is organic farming? 3

GROUP-B

2. Answer any *four* questions from the following: 6×4 = 24
- (a) Describe the mass multiplication of *Rhizobium* sp. 6
- (b) Write down the salient features of cyanobacteria. How are they employ in improving the soil fertility? 3+3
- (c) Describe the process of recycling of bio-degradable waste carried out by municipality. 6
- (d) Discuss the advantages and disadvantages of using organic fertilizers. 3+3
- (e) Write short-notes on: 3+3
- (i) Azolla-Anabaena azollae association
- (ii) Green manuring.
- (f) Discuss the advantages of using VAM to improve the yield in produce in a crop plant. 6

GROUP-C

3. Answer any *two* questions from the following: 12×2 = 24
- (a) What is a bio-fertilizer? Mention the type of microorganisms used as a bio-fertilizers. Discuss the advantages of using bio-fertilizers over chemical fertilizers. 2+5+5
- (b) Describe the types and methods of vermicomposting. 4+8
- (c) Describe the mechanism of nitrogen fixation by cyanobacteria. Write down the significance of Anabaena-Azolla association. State in brief the importance of mycorrhizal association. 6+3+3
- (d) Discuss the crop response to *Azotobacter* inoculum. Describe the mass multiplication and maintenance of inoculum. 4+4+4

PAPER-2

HERBAL TECHNOLOGY

GROUP-A

1. Answer any *four* questions from the following: 3×4 = 12
- (a) Write the full form of HPTLC and GLC. 1 $\frac{1}{2}$ + 1 $\frac{1}{2}$
- (b) Write the scientific name and family of Ashoka. Give one use of this plant. 1+1+1
- (c) Give the botanical name of Black pepper. Write the adulterants. 1+2
- (d) What is the chemical nature of morphine? Which type of glucosides occurs in plant? 1 $\frac{1}{2}$ + 1 $\frac{1}{2}$
- (e) What is ED50 value? 3
- (f) Name a plant that is used in improving the memory. Write down its scientific name. 1 $\frac{1}{2}$ + 1 $\frac{1}{2}$

GROUP-B

2. Answer any *four* questions from the following: 6×4 = 24
- (a) Describe the biological methods of drug evaluation. 6
- (b) Write the botanical name, family and medicinal uses of: 3+3
- (i) Indian Goose berry
- (ii) Fenugreek.
- (c) Describe the phytochemical screening tests for steroids. 6
- (d) Discuss the micropropagation technique of Tulsi. 6
- (e) What is the origin of siddha system of medicine? Discuss the role of medicinal plants in this system. 2+4
- (f) Write down the active principles of *Catharanthus roseus*. Write down the medicinal uses of this plant. 3+3

GROUP-C

3. Answer any *two* questions from the following: 12×2 = 24
- (a) What is secondary metabolites? Discuss the phytochemical screening test for alkaloids and phenolic compounds. 2+5+5
- (b) Discuss the cultivation, harvesting, processing of medicinal plants with reference to *Withania somnifera*. 4+4+4
- (c) Write the botanical name, active principles and medicinal uses of following medicinal plants:
- (i) Plants with cardio-tonic property
- (ii) Anti-rheumatic property.

- (d) Write a note on:
(i) Herbal food
(ii) Storage of Medicinal plant.

PAPER-3
NURSERY AND GARDENING

GROUP-A

1. Answer any **four** questions from the following: 3×4 = 12
- (a) What are the conditions that are essential for seed germination? 3
- (b) Write advantages and disadvantages of vegetative propagation. $1\frac{1}{2} + 1\frac{1}{2}$
- (c) Write a brief note on seed certification system. 3
- (d) Mention advantages and disadvantages of direct seeding.
- (e) Define scarification and mention its significance. 1+2
- (f) What is rooting medium? Give two examples of rooting medium suitable for garden plants.

GROUP-B

2. Answer any **four** questions from the following: 6×4 = 24
- (a) Discuss about the common diseases of garden plants with reference to their managements. 6
- (b) Elaborate the significance and methods of selection of cuttings. 2+4
- (c) Write a short note on manuring of garden plants. 6
- (d) Discuss the role of storage system in seed bank. What is seed vault? 5+1
- (e) Discuss the factors affecting seed viability. 6
- (f) Write a short note on seed production technology. 6

GROUP-C

3. Answer any **two** questions from the following: 12×2 = 24
- (a) Briefly discuss the cultivation process of Cabbage. Give two common varieties of onion. 10+2
- (b) What do you mean by hardening of plant? Briefly describe the procedure of plant hardening. 2+10
- (c) Give an account of objectives and scope of nursery practices in present day. 12
- (d) What do you mean by soil layering? Discuss about different methods and significance of soil layering. 2+8+2

PAPER-4
FLORICULTURE

GROUP-A

1. Answer any **four** questions from the following: 3×4 = 12
- (a) What is pinching? Name two fungal diseases of ornamental plants. 1+2
- (b) Name three plant species commonly used for landscaping educational institution. 3
- (c) Define mulching. Why mulching is important in floriculture? 1+2
- (d) Define cut flower. Name important species used as cut flowers in India.

- (e) What is Ikebana? How does Ikebana differ from the flower arrangement? 1+2
(f) Define the term "Wintering". Why is wintering done in roses? 1+2

GROUP-B

2. Answer any **four** questions from the following: 6×4 = 24
- (a) Describe the elements of an English garden. 6
(b) Name the three important botanical gardens in India along with their respective locations. Discuss the distinguishable features of a Persian garden. 3+3
(c) Discuss the cultivation techniques of orchids. Name two important diseases of orchid. 4+2
(d) Write short notes on:
(i) Hedge
(ii) Topiary.
(e) Describe the process of nursery management. 6
(f) Name two Japanese Gardens situated in India. Discuss the common symptoms of bacterial diseases of Ornamental plants. 2+4

GROUP-C

3. Answer any **two** questions from the following: 12×2 = 24
- (a) Write short notes on: 4×3 = 12
(i) Seed sowing of Nursery plants
(ii) Mughal garden
(iii) Divine vines.
(b) What is indoor gardening? Mention its scope and importance. Briefly discuss the importance of ornamental trees in modern floriculture. 2+4+6
(c) Discuss the role of auxin, gibberellin, cytokinin and ethylene in the field of floriculture. 3+3+3+3
(d) Explain the cultivation techniques of Carnation. Write the botanical name and family of the Carnation. 10+2

PAPER-5

MEDICINAL BOTANY

GROUP-A

1. Answer any **four** questions from the following: 3×4 = 12
- (a) Explain the term Siddha.
(b) What do you understand by endemic species? Give two examples.
(c) Explain the term Umoor-e-tabiya.
(d) What is ethnoecology?
(e) Explain sacred grove.
(f) What is in-situ conservation? Give an example.

GROUP-B

2. Answer any **four** questions from the following: 6×4 = 24
- (a) Discuss the future of pharmacognosy in relation to herbal food. 6
- (b) Discuss the application of ethnobotany and the treatment of infertility and blood pressure. 3+3
- (c) Write a note on folk-medicine prevalent in India. 6
- (d) Discuss the conservational effort of the government on endangered medicinal plants. 6
- (e) How ex-situ conservation is helpful in preserving the medicinal plants? 6
- (f) Write down the objectives of Nursery. 6

GROUP-C

3. Answer any **two** questions from the following: 12×2 = 24
- (a) Discuss the criteria for medicinal plants to be incorporated in Red-list Data Book. Who prepares Red-list Data? 10+2
- (b) Write short notes on concepts of: 4×3 = 12
- (i) Panchamahabhutas
- (ii) Saptadhatu
- (iii) Tridosha.
- (c) Briefly describe medicinal plant production through the following: 3×4 = 12
- (i) Cutting (ii) Layering (iii) Grafting (iv) Budding.
- (d) Discuss the role of sacred grove and folk medicine in ethnobotany. What is palaeo-ethnobotany? 10+2

PAPER-6

PLANT DIVERSITY AND HUMAN WELFARE

GROUP-A

1. Answer any **four** questions from the following: 3×4 = 12
- (a) What do you mean by species diversity?
- (b) What is the difference between in-situ and ex-situ conservation?
- (c) What are avenue trees?
- (d) Name two beneficial microbes and their economical importance. 2+1
- (e) Write the full forms of — IUCN, UNESCO and NBPGR. 1+1+1
- (f) What is NTFP? Give examples. 2+1

GROUP-B

2. Answer any **four** questions from the following: 6×4 = 24
- (a) Write a note on loss of genetic diversity.
- (b) Write an account on ethical and aesthetic values of biodiversity. 3+3
- (c) Describe the importance of forestry and their utilization in India. 3+3
- (d) State the functions of UNEP and UNESCO. 3+3
- (e) Give an account of important fruit crops of India.

- (f) Write short notes on:
(i) Social approaches to conservation
(ii) Ornamental plants of India.

GROUP-C

3. Answer any *two* questions from the following: 12×2 = 24
- (a) Give a detailed account of biodiversity legislation and conservation.
- (b) What is sustainable development? Briefly describe the concept of sustainable development with suitable examples. 3+9
- (c) Define biodiversity. Explain the different levels of biodiversity. 2+10
- (d) Write short notes on: 6+6
- (i) Alcoholic beverages
- (ii) Agrobiodiversity.

PAPER-7

ETHNOBOTANY

GROUP-A

1. Answer any *four* questions from the following: 3×4 = 12
- (a) Define traditional knowledge. Give examples.
- (b) Name three plants used as food plants by ethnic communities.
- (c) Write a short note on sacred grove.
- (d) Write down the significance of herbarium specimens in ethnobotanical studies.
- (e) Define biopiracy and cite an example of biopiracy.
- (f) Write down the role of ethnobotany in modern medicinal practice.

GROUP-B

2. Answer any *four* questions from the following: 6×4 = 24
- (a) Discuss the different categories of plants used by tribal people with reference to resins and oils.
- (b) What is Intellectual Property Rights? Write down the role of IPR in protection of traditional knowledge. 2+4
- (c) Discuss the role of ethnic communities in participatory forest management.
- (d) Discuss the role of ethnic communities in the conservation of plant genetic resources.
- (e) Give examples of ancient literature relevant to ethnobotany. How do they help in preservation of traditional knowledge? 2+4
- (f) Write short notes on: 3+3
- (i) India as a traditional knowledge hotspot
- (ii) Major ethnic groups of India.

GROUP-C

3. Answer any *two* questions from the following: 12×2 = 24
- (a) “Ethnobotany is an important tool to protect the interests of ethnic groups.” Justify the statement with example.
- (b) Write down the aims and scope of ethnobotanical survey. Discuss the methods used for collecting ethnobotanical data. 6+6
- (c) Discuss the legal aspects associated with ethnobotany. Write an account on the current scenario of the marketing of traditional medicinal plants. 6+6
- (d) Mention the significance of following plants in ethnobotanical practices: 6+6
- (i) *Azadirachta indica*
- (ii) *Indigofera tinctoria*.

PAPER-8

MUSHROOM CULTURE TECHNOLOGY

GROUP-A

1. Answer any *four* questions from the following: 3×4 = 12
- (a) What is mother culture? How is it maintained? 2+1
- (b) Mention the scientific name of two poisonous mushroom. 1 ½+1 ½
- (c) What are the factors affecting the mushroom bed preparation? 3
- (d) What are the pure culture and spawn? 1 ½+1 ½
- (e) Mention two mushroom research centres in India. 1 ½+1 ½
- (f) What are the health benefits of Edible mushroom? 3

GROUP-B

2. Answer any *four* questions from the following: 6×4 = 24
- (a) Discuss briefly the long-term storage of mushroom. 6
- (b) Describe the process of cultivation of *Volvariella volvacea*. 6
- (c) Discuss any one spawn preparation technique of edible mushroom. 6
- (d) Discuss the process of composting in mushroom cultivation. 6
- (e) Briefly describe the post-harvest management of mushroom. 6
- (f) Discuss the historical development in mushroom cultivation in India. 6

GROUP-C

3. Answer any *two* questions from the following: 12×2 = 24
- (a) Define sterilization. Discuss the different types of sterilization techniques used in mushroom cultivation. 2+10
- (b) What are the substrate used in the cultivation of button mushroom? Briefly describe the method of cultivation of oyster mushroom. 3+9

- (c) Write short notes on: 6+6
 (i) Edible mushroom
 (ii) Infrastructure require for mushroom cultivation.
- (d) Compare the process of short term storage and long term storage with relevant examples. 6+6

PAPER-9

INTELLECTUAL PROPERTY RIGHT

GROUP-A

1. Answer any **four** questions from the following: 3×4 = 12
- (a) Write the full forms of (i) TRIPS (ii) NBPGR. 1 $\frac{1}{2}$ + 1 $\frac{1}{2}$
- (b) Write down the characteristics of IP. 3
- (c) Explain how IP infringement can be redress. 3
- (d) What is industrial design? Give an example. 2+1
- (e) What is Copyright? In what domain Copyright works? 2+1
- (f) What are the differences between integrated circuit design and industrial design? 3

GROUP-B

2. Answer any **four** questions from the following: 6×4 = 24
- (a) Write a note on: 3+3
 (i) Database protection
 (ii) Economic importance of IPR.
- (b) Briefly discuss the objectives of Patents under Patent act, 1970. 6
- (c) What is Sui-Generis regime? What are the legal provision for providing protection to indigenous people and local communities? 2+4
- (d) With the help of example explain how India has been fighting bio-piracy. 6
- (e) Write a note on Bioprospecting and Plant Variety Protection. 3+3
- (f) Discuss the scope of WTO in relation to patent regime.

GROUP-C

3. Answer any **two** questions from the following: 12×2 = 24
- (a) Describe the rights of farmers under The Protection of Plant Varieties and Farmers Rights Act, 2001. 6+6
- (b) Discuss in detail the objectives, types and rights of trademarks. 4+4+4
- (c) Write short notes on:
 (i) Multilateral treaties
 (ii) Passing off
 (iii) Benefit sharing of Biodiversity.
- (d) Discuss the laws related to protection of semi-conductor chips. What do you understand by domain protection? How is it maintained? 8+2+2

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