UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 4th Semester Examination, 2022

SEC1-P2-BOTANY

Time Allotted: 2 Hours   Full Marks: 60

The figures in the margin indicate full marks.

**The question paper contains Paper - I, II, III, IV, V, VI, VII, VIII and IX.
The candidates are required to answer any *one* from *nine* papers.
Candidates should mention it clearly on the Answer Book.**

PAPER-I

BIOFERTILIZER

GROUP-A

1.	Answer any *four* questions from the following:	3×4 = 12
(a)	Write the full form of PGPR. Mention their application as biofertilizers.	1+2 = 3
(b)	What is mycorrhiza? Name one ectomycorrhiza and one endomycorrhiza.	1+1+1 = 3
(c)	Name one free-living, symbiotic and associative nitrogen-fixing microorganism.	1+1+1 = 3
(d)	What is leghemoglobin? Write the functions of leghemoglobin in symbiotic nitrogen-fixation.	1+2 = 3
(e)	What do you mean by organic farming? What are the advantages of organic farming?	1+2 = 3
(f)	State the full form of VAM fungi. Give two examples of VAM fungi.	1+1+1 = 3

GROUP-B

2.	Answer any *four* questions from the following:	6×4 = 24
(a)	Write short notes on:	3+3 = 6
	(i) Role of *Azolla* in rice cultivation	
	(ii) Actinorhizal symbiosis	
(b)	Discuss in detail, the isolation and inoculum production of VAM.	6
(c)	Write short notes on:	3+3 = 6
	(i) Green manure	
	(ii) Method of composting.	
(d)	Write short notes on:	3+3 = 6
	(i) Classification of biofertilizer	
	(ii) Field application of vermicompost.	
(e)	Distinguish between:	3+3 = 6
	(i) Compost and vermicompost	
	(ii) Solid waste and biodegradable waste.	
(f)	Discuss in brief, the recycling process of biodegradable wastes.	6

GROUP-C

3. Answer any *two* questions from the following: 12×2 = 24

(a) Describe the mechanism of symbiotic nitrogen fixation. Write a note on the factors affecting growth of cyanobacteria. 8+4 = 12

(b) Discuss the isolation, identification and mass multiplications of *Rhizobium*. 12

(c) Distinguish between ectomycorrhiza and endomycorrhiza. State the systematic position and characteristic features of *Azospirillum*. Comment on the isolation process of *Azospirillum*. 3+6+3 = 12

(d) Discuss the classification and characteristic features of *Azotobacter*. Write a note on the crop response and maintenance of *Azotobacter*. 6+6 = 12

PAPER-II

HERBAL TECHNOLOGY

GROUP-A

1. Answer any *four* questions from the following: 3×4 = 12

(a) Define pharmacognosy. Write the scientific name of fenugreek. 2+1 = 3

(b) What are triterpenoids? Give two examples. 1+1+1 = 3

(c) Briefly describe the phytochemical screening tests for alkaloids. 3

(d) Write the uses of ginger in curing ailments. 3

(e) What do you mean by herbal drug? What are the differences between herbal drug and conventional drug? 1+2 = 3

(f) Write the name of adulterants of black pepper. 3

GROUP-B

2. Answer any *four* questions from the following: 6×4 = 24

(a) Write the scientific name, family and medicinal uses of — 3+3 = 6
   (i) Indian gooseberry
   (ii) Tulsi.

(b) Define secondary metabolites. Discuss in brief, the different classes of secondary metabolites. 2+4 = 6

(c) Discuss the role of medicinal plants in Siddha medicine. 6

(d) Describe the process of micropropagation of *Azadirachta indica*. 6

(e) Write a note on the biological testing of herbal drugs. 6

(f) Discuss the analytical profile of *Withania somnifera*. 6

GROUP-C

3. Answer any *two* questions from the following: 12×2 = 24

(a) What is drug adulteration? Discuss different types of drug adulterants. 2+10 = 12

(b) Discuss the history and scope of herbal medicine. Add a note on the marketing and utilization of medicinal plants. 6+6 = 12

(c) Discuss the phytochemical screening tests for steroids and flavonoids. Write a note on the future of pharmacognosy.   6+6 = 12

(d) Discuss the analytical profile of *Clerodendron phlomoides* and *Catharanthus roseus*.   6+6 = 12

PAPER-III
NURSERY AND GARDENING
GROUP-A

1. Answer any *four* questions from the following: 3×4 = 12

(a) Give botanical names of two Indian plants used in gardening. What do you mean by 'hardening of plants'?   2+1 = 3

(b) Name two insect pests of Indian ornamental plants (Give scientific names). $1\frac{1}{2}+1\frac{1}{2}=3$

(c) Define seed production technology. Give two advantages of this technology.   1+2 = 3

(d) What is the most suitable method of propagation for ornamental trees? Give reasons.   1+2 = 3

(e) Define rooftop gardening. Mention one each advantage and disadvantage of using cocopeat in rooftop gardening.   1+1+1 = 3

(f) Write down the three major functions of 'shade house'.   3

GROUP-B

2. Answer any *four* questions from the following: 6×4 = 24

(a) Write a short note on problems and prospects of tomato cultivation in North Bengal.   6

(b) Explain, why vegetative propagation is preferred over sexual one in nursery and gardening practices.   6

(c) Compare direct seeding method and transplanting with reference to their advantages and disadvantages.   3+3 = 6

(d) What are the importance of seed testing? Discuss the methods of breaking seed dormancy.   2+4 = 6

(e) What is scarification? Write down the application of computer in landscape designing.   2+4 = 6

(f) Write notes on: 3+3 = 6
   (i) Rooting medium
   (ii) Low cost manuring.

GROUP-C

3. Answer any *two* questions from the following: 12×2 = 24

(a) Mention briefly the procedures of plant hardening. Explain briefly about the different methods which are involved in gardening operations. Name two common diseases in garden plants.   3+7+2 = 12

(b) Write short notes on: 6+6 = 12
   (i) Green house and its applications
   (ii) Objectives and scopes of gardening.

(c) Discuss about the management of common pests and discuss about the planning and seasonal activities for nursery development.   6+6 = 12

(d) Define seed dormancy. What are the causes of seed dormancy? Mention different methods of breaking seed dormancy of garden plants.   2+4+6=12

PAPER-IV

FLORICULTURE

GROUP-A

1. Answer any *four* questions from the following: 3×4 = 12

   (a) Name one disease each of *Aster, Chrysanthemum* and *Marigold*.   1+1+1 = 3

   (b) Write the names of three ornamental shade trees.   1+1+1 = 3

   (c) What is vase life of a flower? Name one ornamental fern.   2+1 = 3

   (d) Define bonsai. Write two important characters of bonsai.   1+2 = 3

   (e) Name three pests of ornamental plants.   1+1+1 = 3

   (f) What is indoor gardening? Give two plant species used in indoor gardening.   1+2 = 3

GROUP-B

2. Answer any *four* questions from the following: 6×4 = 24

   (a) Discuss the principles of garden design.   6

   (b) What is landscape gardening? Mention the significance of landscape gardening.   2+4 = 6

   (c) Discuss the various methods of bonsai making.   6

   (d) Write notes on: 3+3 = 6

        (i) Mulching (ii) Shading

   (e) Discuss the role of plant growth regulators in floriculture.   6

   (f) Discuss the advantages of vegetative propagation methods of plant propagation.   6

GROUP-C

3. Answer any *two* questions from the following: 12×2 = 24

   (a) Define commercial floriculture. Describe the factors affecting flower production. What is topiary?   2+7+3 = 12

   (b) Define cut-flower. Briefly describe the process of packaging of cutflowers. Discuss the cultivation technique of Orchids.   1+5+6 = 12

   (c) Discuss the principles of Italian and Japanese garden design. Name two famous Mughal gardens in India.   5+5+2 = 12

   (d) Write notes on: 6+6 = 12

        (i) nursery management

        (ii) pot cultivation.

PAPER-V

MEDICINAL BOTANY

GROUP-A

1. Answer any *four* questions from the following: 3×4 = 12

    (a) Give two examples of endangered medicinal plants. Define endemic species. 1+2 = 3

    (b) Define ayurveda and briefly discuss the scope of ayurveda. 1+2 = 3

    (c) Define panchamahabhutas. 3

    (d) Define botanical garden. Name two botanical gardens of India. 1+2 = 3

    (e) Define ex-situ conservation. Give two examples of ex-situ conservation. 1+2 = 3

    (f) Define polyherbal formulations. Cite two examples of polyherbal formulations. 1+2 = 3

GROUP-B

2. Answer any *four* questions from the following: 6×4 = 24

    (a) Write short notes on: 3+3 = 6

    　(i) Sacred grove

    　(ii) Grafting.

    (b) Write a note on the objectives and classification of nursery. 3+3 = 6

    (c) Discuss the concept of Unani with special reference to Umoor-e-Tabiya. 6

    (d) Write a note on the role of ethnobotany as a tool to protect interests of ethnic groups. 6

    (e) Discuss the applications of folk medicines in ethnobotany. 6

    (f) Distinguish between — 3+3 = 6

    　(i) Cutting and layering

    　(ii) National parks and biosphere reserves.

GROUP-C

3. Answer any *two* questions from the following: 12×2 = 24

    (a) Mention the applications of natural products in — 3+3+3+3 = 12

    　(i) Blood pressure

    　(ii) Skin diseases

    　(iii) Diabetes

    　(iv) Jaundice

    (b) Discuss the role of in-situ conservation in protecting endangered medicinal plants. 12

    (c) What are the important components of a nursery? Discuss the uses of green house for nursery production. 6+6 = 12

    (d) Define ethnoecology. Discuss the methods to study ethnobotany. Write a note on the ethnic communities of India. 2+6+4=12

PAPER-VI
PLANT DIVERSITY AND HUMAN WELFARE
GROUP-A

1. Answer any *four* questions from the following: 3×4 = 12

 (a) Name three important timber producing plants. 1+1+1 = 3

 (b) What are land races? 3

 (c) Briefly discuss loss of biodiversity. 3

 (d) What do you understand by the term "sustainable development"? 3

 (e) Define 'biodiversity'. 3

 (f) What is the importance of Red data book? 3

GROUP-B

2. Answer any *four* questions from the following: 6×4 = 24

 (a) Write a note on Alcoholic beverages. 6

 (b) Give an account of important fruit crops and their commercial importance. 6

 (c) Write short notes on: 3+3 = 6

  (i) WWF and its objectives

  (ii) Ornamental plants in India.

 (d) Give an account of beneficial uses of microbes. 6

 (e) What is genetic diversity? Why conservation of genetic diversity is important? 2+4 = 6

 (f) What are the importance of biodiversity awareness programmes? 6

GROUP-C

3. Answer any *two* questions from the following: 12×2 = 24

 (a) Discuss In-situ and Ex-situ conservation. Explain with examples. 6+6 = 12

 (b) Write notes on: 6+6 = 12

  (i) Agrobiodiversity

  (ii) Species diversity.

 (c) Briefly discuss the values of Biodiversity. Write a note on wild taxa. 8+4 = 12

 (d) Discuss the role of NBPGR and IUCN in management of Biodiversity. 6+6 = 12

PAPER-VII
ETHNOBOTANY
GROUP-A

1. Answer any *four* questions from the following: 3×4 = 12

 (a) Define ethnobotany. Who is considered as the Father of Indian Ethnobotany? 2+1 = 3

 (b) What do you mean by traditional knowledge? Give two important significances of traditional knowledge. 1+2 = 3

 (c) What is the scientific name of Neem? Mention its two important uses. 1+2 = 3

(d) Define Intellectual Property Right (IPR). From which year it came into force in India?   3

(e) What are the three major objectives of traditional knowledge?   3

(f) Name any three food yielding plants used by the Indian tribes.   3

GROUP-B

2. Answer any *four* questions from the following: 6×4 = 24

(a) Write short notes on: 3+3 = 6

    (i) *Ocimum sanctum*

    (ii) *Vitex negundo*

(b) Discuss, how ethnobotany can be used as a tool to protect the interests of the tribes of India.   6

(c) "Ethnobotany is an interdisciplinary science." Justify this statement.   6

(d) Explain, how the study of ethnobotany is carried out in sacred places.   6

(e) Write the scientific names and their active principles of the following categories of plants as used by the ethnic groups of India.   2+2+2=6

    (i)   Beverage

    (ii) Oils

    (iii) Intoxicants.

(f) Write the significances of *Indigofera tinctoria* in ethnobotanical practices.   6

GROUP-C

3. Answer any *two* questions from the following: 12×2 = 24

(a) How many types of Intellectual Property Right exist in India? Describe in brief, the concept and economic importance of Intellectual Property Right.   4+8 = 12

(b) What are the major roles played by the ethnic-groups in order to conserve the plant genetic resources? Explain briefly the wealth concept with one example from India.   8+4 = 12

(c) Briefly explain, how the archaeological findings and ancient literatures are important in ethnobotanical studies.   6+6 = 12

(d) Mention the significances of the following plants in ethnobotanical practices:

    (i) *Rauvolfia serpentina*

    (ii) *Withania* sp.

PAPER-VIII

MUSHROOM CULTURE TECHNOLOGY

GROUP-A

1. Answer any *four* questions from the following: 3×4 = 12

(a) Name the different sources for the isolation of a pure culture in mushroom cultivation. Where is the gene bank of mushroom maintained?   2+1 = 3

(b) Name the most common type of spawn used nowadays in India. What are the composition of PDA?   1+2 = 3

(c) After how many days the first turning is given while preparing the compost for button mushroom cultivation? Name one poisonous mushroom and one medicinal mushroom.   1+1+1=3

(d) Discuss the short method of composting in button mushroom cultivation.   3

(e) Define pure culture. Name any two chemicals used as disinfectants.   1+1+1=3

(f) Name any two Indian Mushroom Research Centres. Which pH range is most suitable for the preparation of spawn?   2+1=3

GROUP-B

2. Answer any *four* questions from the following: 6×4 = 24

(a) Describe the method of spawn preparation of button mushroom.   6

(b) Write a note on: 3+3 = 6
   (i) Medicinal mushroom
   (ii) Poisonous mushroom

(c) What are the importance of 'bed' in mushroom cultivation? What are the factors that affect the mushroom bed preparation?   2+4 = 6

(d) Discuss briefly about export quality of mushroom. Name two largest mushroom producing units of India.   4+2 = 6

(e) Define post-harvest management of mushroom. Discuss briefly about the long term storage of mushroom.   2+4 = 6

(f) Define canning of mushroom and discuss its various methods.   2+4 = 6

GROUP-C

3. Answer any *two* questions from the following: 12×2 = 24

(a) Write short notes on: 4×3 = 12
   (i) Pickles preparation from mushroom
   (ii) Papad preparation from mushroom
   (iii) Importance of Polythene bag and culture racks.

(b) Define drying of mushroom. What is the importance of drying in the storage of mushroom? Briefly describe, how mushrooms are preserved in salt solution.   2+3+7=12

(c) Briefly describe the history of mushroom cultivation in India. Discuss the importance of mushroom cultivation.   6+6 = 12

(d) Comment on the nutritional values of mushroom. Briefly describe two Indian food recipes.   8+4 = 12

PAPER-IX

INTELLECTUAL PROPERTY RIGHTS

GROUP-A

1. Answer any *four* questions from the following: 3×4 = 12

(a) What is trademark protection?

(b) Write the full form of WIPO. What is its function?

(c) What do you mean by copyright infringement?

(d) What is the difference between product patent and process patent?

(e) Can a product contain multiple patents? Justify with example.

(f) Write a short note on India's position in GI registration.

GROUP-B

2. Answer any *four* questions from the following: 6×4 = 24

(a) What is biopiracy? Give some examples of biopiracy and write the measures to restrict it. 2+4 = 6

(b) Write short notes on: 3+3 = 6

   (i)   Trade secret

   (ii) Copyright transfer agreement.

(c) Write a short account on trademark registration and protection in India. 3+3 = 6

(d) What does copyright mean? What are the different types of work that can be protected by copyright?

(e) What is a patent? Describe the different types of patent with example. 2+4 = 6

(f) What is data protection? Discuss the status of data protection in India. 2+4 = 6

GROUP-C

3. Answer any *two* questions from the following: 12×2 = 24

(a) What is intellectual property? Discuss briefly about the patent law in India. Describe the process of filing a patent. 2+4+6=12

(b) What is a design patent? How does it differ from utility patent? Citing one example, elaborate on how a design patent works. 2+4+6=12

(c) Define traditional knowledge. Discuss whether traditional knowledge is protected by IPR. Write an account on the purpose and applications of TKDL. 2+4+6=12

(d) Write short notes on: 4×3 = 12

   (i)   Protection of Plant Varieties and Farmers Rights Act

   (ii) Geographical Indications and their significance

   (iii) Patent rights.

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