'समानो मन्त्रः समितिः समानी'

UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 3rd Semester Examination, 2021

SEC1-P1-BOTANY

Time Allotted: 2 Hours | Full Marks: 60

The figures in the margin indicate full marks.

The question paper contains Paper-I, Paper-II, Paper-III, Paper-IV, Paper-V, Paper-VI, Paper-VII, Paper-VIII and Paper-IX.
Candidates are required to answer any *one* from *nine* papers and they 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) What is biofertilizer? Give two examples. 1+2

   (b) Comment on *Azolla-Anabaena* association. 3

   (c) Distinguish between compost and vermicompost. 3

   (d) What is VAM fungi? Mention their two important applications. 1+2

   (e) Define green manure. Give two examples. 1+2

   (f) Define Actinorhizal symbiosis. Name one bacterium exhibiting this association. 2+1

GROUP-B

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

   (a) What is compost? Discuss various advantages of using organic fertilizer. 2+4

   (b) Discuss in brief the process of mass multiplication of *Azospirillum*. 6

   (c) Give an account of the different types of mycorrhizal associations mentioning the significance of each type. 6

   (d) Comment on the recycling of biodegradable municipal wastes. 6

   (e) Write notes on: 3+3

   (i) Applications of blue green algae, (ii) Classification of biofertilizer.

   (f) Distinguish between: 3+3

   (i) Solid waste and agricultural waste, (ii) Biodegradable and non-degradable wastes.

GROUP-C

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

(a) Discuss in detail the mechanism of nitrogen-fixation by cyanobacteria. State the applications of cyanobacterial biofertilizer. 6+6

(b) Discuss in detail about VAM emphasizing on the isolation and inoculum production. Discuss the method of vermicomposting. 4+4+4

(c) Give the systematic position and characteristic features of *Azotobacter*. Give an account of the production and application of *Azotobacter*. 3+3+3+3

(d) Write notes on: 4+4+4

(i) Biocompost making methods, (ii) Organic farming, (iii) Azolla in rice cultivation.

PAPER-II

HERBAL TECHNOLOGY

GROUP-A

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

(a) Write down the botanical name and family of a plant having cardiotonic properties along with its active principles. 1+1+1

(b) Mention the sources and adulterants of fenugreek (Methi). 3

(c) Distinguish between organized and unorganized drugs. 3

(d) What do you mean by 'herbal food'? Mention its significance in modern day. 1+2

(e) Define stomatal index and stomatal frequency. Mention their significance in herbal medicine. $1\frac{1}{2}+1\frac{1}{2}$

(f) What do you mean by aromatherapy? Name two plants used in aromatherapy. 1+2

GROUP-B

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

(a) Describe the uses of Ashoka in curing different ailments. 6

(b) What is alkaloid? Write a note on phytochemical screening test for alkaloids. 1+5

(c) Write a brief essay on future prospects of pharmacognosy. 6

(d) Discuss about the biological testing of herbal drugs along with suitable example. 6

(e) Discuss about the marketing of medicinal plants and its problems. 6

(f) Write notes on: 3+3

(i) Herbal Therapy, (ii) Uses of Indian Gooseberry.

GROUP-C

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

(a) What is 'Siddha System' of medicine? Discuss the role of plants in this system. 2+10

(b) What do you mean by drug adulteration? Discuss about different types of adulteration. 2+10

(c) What is secondary metabolite? Mention different types of pharmacological activities of steroids. 2+10

(d) Explain and discuss the importance and uses of medicinal plants on human health. 12

PAPER-III

NURSERY AND GARDENING

GROUP-A

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

(a) Mention the causes of genetic erosion with examples. $1\frac{1}{2}+1\frac{1}{2}=3$

(b) What are the factors affecting seed viability? 3

(c) Explain the term 'air layering'. 3

(d) What is a mist chamber? 3

(e) Write down the scientific names of lady's finger, tomato and carrot. 3

(f) What is a shade house? 3

GROUP-B

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

(a) What are the differences between direct seeding and transplants? 3+3

(b) Illustrate the factors affecting seed viability. 6

(c) Write an essay on infrastructure of an ideal nursery. 6

(d) What is the role of management of pests and diseases in gardening? 6

(e) Discuss the scope and prospect of gardening in the present day. 6

(f) What does testing and certification of seed mean? Explain. 3+3

GROUP-C

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

(a) Define seed dormancy. Write the causes of seed dormancy. What are methods for breaking seed dormancy? 2+5+5

(b) Give a detail account on cultivation of lady's finger. Name two common varieties of lady's finger. 10+2

(c) What do you mean by hardening of plants? Write down the functions of shade house and glass house. What is cutting selection? 2+3+3+4

(d) Discuss different types of vegetative propagation used in Nursery and Gardening practices. 12

PAPER-IV

FLORICULTURE

GROUP-A

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

(a) What is soil sterilization? Mention its significance. 2+1

(b) Name three plants commonly used for landscaping highways. 1+1+1

(c) Define nursery management. Comment on its significance. 2+1

(d) What is routine garden operation? Mention why is this done. 2+1

(e) What is pinching? 3

(f) Define plant growth regulators. 3

GROUP-B

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

(a) Define floriculture. Comment on the role of hi-tech floriculture in income generation for livelihood. 2+4

(b) Describe the features of Mughal Gardens mentioning the gardening principles involved. 6

(c) How are cacti and succulents cultivated? Discuss with examples. 3+3

(d) What is indoor gardening? Mention the scope and importance of this type of gardening in the context of present day. 2+2+2

(e) What are ferns? Comment on their significance in floriculture. 2+4

(f) Discuss between vegetative and sexual methods of propagation. Describe in brief some of the most commonly used methods of vegetative propagation. 2+4

GROUP-C

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

(a) Define diseases. Briefly describe the two most commonly occurring diseases of ornamental plants and their preventive measures. 2+5+5

(b) What is 'Ikebana'? Give a brief account of different types of flower arrangements that you have studied. 2+10

(c) Give an account of the cultivation techniques of orchids. Name two tropical varieties of orchids. 10+2

(d) Discuss in detail the landscaping of an educational institution. 12

PAPER-V

MEDICINAL BOTANY

GROUP-A

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

(a) Define endemic species. Name two botanical names of endemic medicinal plants of India. 1+2

(b) Who is considered as the 'Father of Modern Ethnobotany'? Who coined the term Ethnobotany and when? 1+1+1

(c) Define in-situ conservation. Give two examples of this conservation. 1+2

(d) Define Sacred grove. Point out the importance of National Park for the conservation of threatened species. 1+2

(e) Mention the 'Red List Criteria' of threatened plants. 3

(f) What is Umoor-e-tabiya? Explain. 1+2

GROUP-B

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

(a) Discuss the origin and basis of Siddha medicinal system. 6

(b) Mention the importance of Nursery for the propagation of medicinal plants. 6

(c) Define grafting. What are the advantages of grafting? 2+4

(d) Discuss how Ethnobotany can be used as a tool to protect the interest of ethnic groups. 6

(e) Classify Nursery. Mention the importance of green house in Nursery Management. 3+3

(f) Briefly describe the application of natural products on diabetics. 6

GROUP-C

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

(a) Differentiate between *In situ* and *Ex situ* conservation. How medicinal plants are conserved in *in situ* conservation method. Explain. 4+8

(b) Write briefly on the application of natural products in the treatment of cardiac and skin diseases. 6+6

(c) Define biosphere reserves. Discuss their role in conservation of endangered medicinal plants. 6+6

(d) Write short notes on: 6+6

(i) Ayurveda system, (ii) Unani system.

PAPER-VI

PLANT DIVERSITY AND HUMAN WELFARE

GROUP-A

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

(a) Define genetic diversity with suitable examples.

(b) What is agrobiodiversity?

(c) Mention three reasons for the loss of species diversity.

(d) Give the full forms of – IUCN, UNESCO and NBPGR.

(e) Comment on the role of plants in relation to human welfare.

(f) Distinguish between in-situ and ex-situ conservation.

GROUP-B

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

(a) Write a short note on plant diversity and its conservation. 6

(b) Define the term sustainable development. Mention its uses. 6

(c) Mention the importance of forestry and their utilization. 6

(d) What are the different organizations associated with biodiversity management? Mention the roles played by them. 6

(e) Briefly discuss the different biodiversity legislation. 6

(f) Give and account of the varieties of ornamental plants found in India. 6

GROUP-C

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

(a) Give a detailed account of biodiversity information management and communication. 12

(b) Discuss the role of biodiversity awareness programmes in conservation of biodiversity. 12

(c) Discuss the different methodologies used for valuation of plant diversity. 12

(d) Write notes on: 4×3 = 12

(i) Ethical and aesthetic values of biodiversity

(ii) Avenue trees

(iii) Beneficial uses of microbes.

PAPER-VII

ETHNOBOTANY

GROUP-A

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

(a) Define Ethnobotany. Who is the father of Ethnobotany? 2+1

(b) What do you mean by 'Traditional Knowledge'? Give two significance of traditional knowledge. 1+2

(c) Mention the importance of 'field work' in the study of ethnobotany. 3

(d) Define ethnic group. Name one each of major and minor Indian ethnic group. 1+2

(e) Distinguish between Ethnobotany and traditional botany. 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) Define Intellectual Property Right (IPR). Mention how IPR can be used to protect the interests of ethnic groups. 1+5

(b) Comment on the role of Ethnobotany in modern Medicine. 6

(c) Write the scientific name and uses of the following categories of plants used by the tribal people: 6

(i) Food plants, (ii) Oil and resins, (iii) Intoxicants.

(d) What is biopiracy? How does biopiracy affect traditional knowledge? 1+5

(e) 'Ethnobotany is an interdisciplinary science'. Justify the statement. 6

(f) Write notes on: 3+3

(i) Role of ethnic groups in conservation of plant genetic resources

(ii) Major ethnic tribes of India.

GROUP-C

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

(a) Discuss the role of sacred grove and temples in ethnobotanical studies. Mention the significance of *Gloriosa superba* in ethnobotanical practices. 10+2

(b) Briefly explain how the archaeological findings and ancient literatures help in ethnobotanical studies. 6+6

(c) Mention the significance of the following in modern medicine- 4+4+4
(i) *Trichopus zeylanicus*, (ii) *Withania* sp., (iii) *Rauvolfia serpentina*.

(d) Write notes on:
(i) Participatory forest management, (ii) Sharing of wealth concept.

PAPER-VIII

MUSHROOM CULTURE TECHNOLOGY

GROUP-A

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

(a) State the uses of compost left after the harvest of mushrooms.

(b) What materials are used for mushroom bed preparation?

(c) Name one each of edible and poisonous mushroom.

(d) Mention the nutritional attributes of mushroom protein.

(e) Distinguish between compost and spawn.

(f) What is to be done if ammonia smell still persists in button mushroom compost?

GROUP-B

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

(a) Briefly describe pharmaceutical and commercial importance of oyster mushroom. 6

(b) Describe the method of spawn preparation of oyster mushroom. 6

(c) Write a short note on 'food value of mushrooms'. 6

(d) Describe the different kind of food products prepared from mushroom for the market. 6

(e) Mention the possible reasons for the contamination of spawn and compost. 6

(f) Describe the various uses of spent compost/substrate. 6

GROUP-C

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

(a) Describe the post-harvest processing and value addition in mushrooms. 12

(b) Give an account of the different methods of preservation of mushroom for marketing and future use. 12

(c) Discuss the major problems in mushroom cultivation and also mention the measures to be undertaken for eradication of problems. 12

(d) Write short notes on: 4×3 = 12
   (i) Medicinal properties of mushrooms
   (ii) Export value of mushrooms
   (iii) Poisonous mushrooms.

PAPER-IX

GROUP-A

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

(a) Write a short note on the objective of Patents. 3
(b) Write a note on Protection of Goodwill. 3
(c) What is Traditional Knowledge Digital Library? 3
(d) What is national gene bank? 3
(e) What are multilateral treaties? 3
(f) Define copyright. How does the copyright work? 1+2

GROUP-B

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

(a) Write short notes on: 3+3
   (i) Applications of IPR in Biotechnology
   (ii) Concept of Novelty.
(b) Write a short note on computer softwares and IPR. 6
(c) Give a detailed account of the PPVFR Act 2001. 6
(d) Provide a list of objectives of the Protection of Plant Varieties. Also, provide justifications. 4+2
(e) Briefly describe Rights and Assignments with respect to Industrial Design. 3+3
(f) Provide concepts and objectives of Traditional Knowledge. 2+4

GROUP-C

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

(a) What are geographical indications? What is the international position on them? What are the objectives of GIs? 2+6+4
(b) Explain the following terms with respect to trademarks: 4×3 = 12
   (i) Infringement, (ii) Passing off, (iii) Defence.
(c) Write short notes on: 6×2 = 12
   (i) Rights with respect to copyright, (ii) Transfer of copyright.
(d) Briefly describe the concept and economic importance of intellectual property right. How many types of IPR exist? 8+4

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