This question paper contains **2** printed pages]

NEPWT—1001—2024

FACULTY OF SCIENCE AND TECHNOLOGY

M.Sc. (First Year) (First Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

(NEP-2020)

RESEARCH METHODOLOGY

(Tuesday, 10-12-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—3 *Hours* *Maximum Marks*—60

N.B. :— (*i*) Question No. **1** is compulsory.

(*ii*) Of the remaining solve any *three* questions.

(*iii*) Calculator and log table is allowed.

1. Attempt any *three* of the following : 15

   (*a*) Motivation in research

   (*b*) Need for research designing

   (*c*) ANOCOVA

   (*d*) Statistical measure in research.

2. (*a*) What do you mean by research ? Describe the different steps involved in a research process. 8

   (*b*) Discuss the observation method as a technique of data collection. 7

P.T.O.

3. (*a*) Calculate the mean, median and mode of the following data : 8

3, 6, 3, 7, 4, 3, 9

(*b*) Draw the flow diagram for hypothesis testing. 7

4. (*a*) What is Sampling ? Explain steps in sample design. 8

(*b*) Calculate the chi-square value of the following data : 7

Fully Agree	**Not Sure**	**Not Agree**	**Total**
102	108	75	285

5. (*a*) Define case study. Give their characteristics. 8

(*b*) Explain dependent and independent variables. 7

6. Write short notes on : 15

(*a*) Fundamental type of research

(*b*) Parametric test

(*c*) Secondary data sources.

This question paper contains **2** printed pages]

NEPWT—317—2024

FACULTY OF SCIENCE AND TECHNOLOGY

M.Sc. (First Year) (First Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

BOTANY

Paper SBOTE-401

(Bioinstrumentation and Methods in Biology)

(Thursday, 19-12-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—3 *Hours* *Maximum Marks*—60

Note :— (*i*) Question No. **1** is compulsory.

(*ii*) Of the remaining, attempt any *three* questions.

(*iii*) Draw neat and well labelled diagram wherever required.

1. Write brief notes on (any *three*) : 15

   (*a*) Working of compound microscope

   (*b*) Autoclave

   (*c*) Beer-Lambert's law

   (*d*) RFLP technique.

2. Write in brief on :

   (*a*) Safe use of laboratory equipments. 8

   (*b*) Working and application of simple microscope. 7

P.T.O.

3. Describe in brief :

(*a*) Working and applications of laminar air flow. 8

(*b*) Sterilization by filtration methods. 7

4. Write in brief on :

(*a*) Principles and techniques of colorimeter. 8

(*b*) X-ray diffraction. 7

5. Explain in brief :

(*a*) Principle and applications of electrophoresis. 8

(*b*) Southern blotting techniques. 7

6. Write brief notes on any *three* : 15

(*a*) Micrometry

(*b*) pH meter

(*c*) Uses of radioisotopes in life sciences

(*d*) RAPD technique.

This question paper contains **2** printed pages]

NEPWT—50—2024

FACULTY OF SCIENCE

M.Sc. (First Year) (First Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

BOTANY

Paper–SBOTC-401

(Diversity of Microbes)

(Thursday, 12-12-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—3 *Hours* *Maximum Marks*—80

N.B. :— (*i*) Question No. **1** is compulsory.

(*ii*) Of the remaining, attempt any *three* questions.

(*iii*) Draw neat and labelled diagram wherever required.

1. Write brief notes on the following : 20

(*a*) Structure of fruticose lichen

(*b*) Characteristics of deuteromycetes

(*c*) Economic importance of mycoplasma

(*d*) Cell wall of gram –ve bacteria.

P.T.O.

2. Write brief notes on the following :

(*a*) Explain conjugation in Bacteria. 10

(*b*) Describe classification of virus on basis of host. 10

3. Write brief notes on the following :

(*a*) Explain structure of Cleistothecium in Ascomycetes fungi. 10

(*b*) Describe composting, spawning and casing in mushroom cultivation. 10

4. Write brief notes on the following :

(*a*) Explain Endo-mycorrhiza. 10

(*b*) Describe structure of urediniospore and teliospore in wheat rust. 10

5. Write brief notes on the following :

(*a*) Describe Grassy shoot disease. 10

(*b*) Explain symptoms and control measures of citrus canker. 10

6. Write brief notes on the following : 20

(*a*) Transformation in Bacteria

(*b*) Beam mosaic virus

(*c*) Thallus of Rhizopus fungi

(*d*) VAM Importance.

This question paper contains **2** printed pages]

NEPWT—116—2024

FACULTY OF SCIENCE AND TECHNOLOGY

M.Sc. (First Year) (First Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

(NEP Pattern)

BOTANY

Paper SBOTC-402

(Diversity of Cryptogams)

(Saturday, 14-12-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—80

Note :— (*i*) Question No. **1** is compulsory.

(*ii*) Of the remaining, attempt any *three* questions.

(*iii*) Draw neat and labelled diagram wherever required.

1. Write brief notes on the following : 20

(*a*) Reserve food in algae

(*b*) Nucule and Globule in chara.

(*c*) Funaria Gametophyte

(*d*) Economic importance of pteridophytes.

P.T.O.

2. Describe in brief :

(*a*) Asexual reproduction in algae. 10

(*b*) Ultrastructure of algal cell. 10

3. Write in brief :

(*a*) General morphology and asexual reproduction in Phaeophyta. 10

(*b*) Economic importance of algae. 10

4. Describe in brief :

(*a*) Structure of Anthoceros sporophyte. 10

(*b*) Morphological and anatomical characters of Riccia gametophyte. 10

5. Describe in brief :

(*a*) Morphological and anatomical characters of equisetum. 10

(*b*) Morphological and anatomical characters of Lycopodium sporophyte. 10

6. Write brief notes on the following : 20

(*a*) Algal blooms

(*b*) Botrydium

(*c*) Antheridiophore in marchantia

(*d*) Heterospory.

This question paper contains **2** printed pages]

NEPWT—183—2024

FACULTY OF SCIENCE

M.Sc. (First Year) (First Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

BOTANY

Paper SBOTC-403

(Taxonomy of Angiosperms and Gymnosperms)

(Tuesday, 17-12-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—80

Note :— (*i*) Question No. **1** is compulsory.

(*ii*) Of the remaining, attempt any *three* questions.

(*iii*) Draw neat and labelled diagrams wherever required.

1. Write brief notes on the following : 20

   (*a*) Classification of Gymnosperms by sporne (1965)

   (*b*) Continental drift theory

   (*c*) Diagnostic characters of family Apiaceae.

   (*d*) Operational Taxonomic Units (OTUs).

2. (*a*) Describe in detail comparative account on coniferales. 10

   (*b*) Explain in detail general account on pteridospermales. 10

P.T.O.

3. (*a*) What is concept of species ? Describe in detail biological species concept. 10

(*b*) Give a detailed account on principles, important rules of ICNafp 10

4. (*a*) Describe in detail Cronquist's system of classification with its merits and demerits. 10

(*b*) Explain in detail general account on the family Verbenaceae with its floral formula and floral diagrams. 10

5. (*a*) Describe in detail molecular systematics. 10

(*b*) Give a detailed account on Bio-systematics. 10

6. Write brief notes on the following : 20

(*a*) Economic importance of Gymnosperms.

(*b*) Allopatric speciation

(*c*) Merits and demerits of Bentham and Hooker's classification

(*d*) Classes of chemical compounds with their taxonomic significances.

This question paper contains **2** printed pages]

NEPWT—31—2024

FACULTY OF SCIENCE

M.Sc. (First Year) (Second Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

BOTANY

Paper SBOTC-1451

(Cell Biology, Genetics and Plant Breeding)

(Wednesday, 11-12-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—3 *Hours* *Maximum Marks*—80

N.B. :— (1) Question No. **1** is compulsory.

(2) Of the remaining attempt any *three* questions.

(3) Draw neat and well labelled diagrams wherever necessary.

1. Write brief notes on the following : 20

(*a*) Cell signalling

(*b*) Epistasis

(*c*) Genetic drift

(*d*) Importance of hybridization.

2. (*a*) Describe structure and function of cell membrane. 10

(*b*) Explain structure and functions of chromosome. 10

P.T.O.

3. (*a*) Explain in detail cytoplasmic inheritance. 10

(*b*) Describe factors affecting gene frequency. 10

4. (*a*) Describe in detail crossing over. 10

(*b*) Describe characters of multiple alleles with suitable example. 10

5. (*a*) Describe incompatibility and male sterility in plants. 10

(*b*) Describe procedure and applications of mutational breeding. 10

6. Write brief notes on the following : 20

(*a*) G-protein coupled receptor

(*b*) Crossing over

(*c*) C-value paradox

(*d*) Types of self-pollination.

This question paper contains **2** printed pages]

NEPWT—97—2024

FACULTY OF SCIENCE

M.Sc. (First Year) (Second Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

BOTANY

SBOTC-1452

(Plant Resource Utilization and Biodiversity Conservation)

(Friday, 13-12-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—3 *Hours* *Maximum Marks*—80

N.B. :— (1) Question No. **1** is compulsory.

(2) Of the remaining, attempt any *three* questions.

(3) Draw neat and well labelled diagrams wherever necessary.

1. Write brief notes on the following : 20

   (*a*) Plants as source of renewable energy

   (*b*) Ecosystem diversity

   (*c*) Project tiger

   (*d*) Chipko movement.

2. (*a*) Explain role of biotechnology in agriculture. 10

   (*b*) Describe origin, method of cultivation, harvesting and economic importance of any *one* timber yielding plant. 10

P.T.O.

3. (*a*) What is IUCN ? Describe its categories. 10

(*b*) Explain in detail the concept of Convention on Biological Diversity (CBD). 10

4. (*a*) What is conservation ? Explain the conservation strategies. 10

(*b*) Describe in detail the current practices in species diversity conservation. 10

5. (*a*) Describe in detail the role of BSI in sustainable development. 10

(*b*) Describe in detail the role of Educational Institutes in Biodiversity conservation. 10

6. Write short notes on the following : 20

(*a*) Greenhouse Technology

(*b*) Bioprospecting

(*c*) Home garden conservation

(*d*) ICAR.

This question paper contains **2** printed pages]

NEPWT—164—2024

FACULTY OF SCIENCE

M.Sc. (Second Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

BOTANY

Paper SBOTC-1453

(Plant Anatomy and Embryology of Angiosperms)

(Monday, 16-12-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—80

Note :— (*i*) Question No. **1** is compulsory.

(*ii*) Of the remaining, attempt any *three* questions.

(*iii*) Draw neat and well labelled diagrams wherever necessary.

1. Write brief notes on the following : 20

(*a*) Cytological and molecular aspects of SAM.

(*b*) Leaf structure with reference to Kranz anatomy.

(*c*) Pollen wall

(*d*) Importance of palynology.

P.T.O.

2. Describe in detail :

(*a*) Organization of RAM. 10

(*b*) Primary and secondary growth in dicot stem. 10

3. Describe in detail :

(*a*) Types and functions of secretory tissues. 10

(*b*) Floral meristem and floral development in Arabidopsis. 10

4. Describe in detail :

(*a*) Development of male gametophyte. 10

(*b*) Types and functions of endosperms. 10

5. Describe in detail :

(*a*) Role of Palynology in taxonomy. 10

(*b*) Techniques of pollen analysis. 10

6. Write brief notes on the following : 20

(*a*) Scope of histology

(*b*) Phyllotaxy

(*c*) Polyembryony

(*d*) Pollen morphology.

This question paper contains **2** printed pages]

NEPWT—273—2024

FACULTY OF SCIENCE AND TECHNOLOGY

M.Sc. (First Year) (Second Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

BOTANY

Paper-SBOTE-1451

(Plant Ecology, Environmental Biology and Phytogeography)

(Wednesday, 18-12-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—3 *Hours* *Maximum Marks*—60

Note :— (*i*) Question No. **1** compulsory.

(*ii*) Of the remaining, attempt any *three* questions.

(*iii*) Draw neat and labelled diagram wherever required.

1. Write brief notes on any *three* : 15

   (*a*) Scope of ecology in India.

   (*b*) What is ecotone ? Write a note on characteristics of ecotone

   (*c*) Ozone layer

   (*d*) Land bridge.

2. Describe in brief :

   (*a*) Carbon cycle 8

   (*b*) Methods of estimating primary production. 7

P.T.O.

3. Explain in brief :

(*a*) What is ecological succession ? Describe mechanism and its types. 8

(*b*) Population growth curve. 7

4. Describe in brief :

(*a*) Causes, effects and control measures of soil pollution. 8

(*b*) Urban problems related to energy. 7

5. Explain in brief :

(*a*) What is social forestry ? Add a note on afforestation and deforestation. 8

(*b*) Continental drift theories. 7

6. Write short notes on any *three* : 15

(*a*) Food web

(*b*) Age pyramids

(*c*) Phytoremediation

(*d*) Theory of tolerance.

This question paper contains **2** printed pages]

NEPWT—214—2024

FACULTY OF SCIENCE

M.Sc. (Second Year) (Third Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

BOTANY

SBOTE-501

(Classical Angiosperm Systematics)

(Tuesday, 17-12-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—60

N.B. *:—* (*i*) Question No. **1** is compulsory.

(*ii*) Of the remaining, attempt any *three* questions.

(*iii*) Draw neat and labelled diagrams wherever necessary.

1. Write short notes on : 15

(*a*) Principle of priority 4

(*b*) Floral formula and Floral Diagram of family Malvaceae 4

(*c*) Scope of plant taxonomy 4

(*d*) APG. 3

P.T.O.

2. Describe in brief : 15

(*a*) Describe in brief species concept. 8

(*b*) Describe in brief probable ancestors of angiosperms. 7

3. Explain in brief : 15

(*a*) Explain in brief the type method 8

(*b*) Explain in brief pre-Darwanian classification 7

4. Describe in brief : 15

(*a*) Describe in brief general characters of family–Meliaceae with its floral formula and floral diagram. 8

(*b*) Describe in brief general characters of family–Cruciferae with its floral formula and floral diagram. 7

5. Explain in brief : 15

(*a*) Explain in brief family–Gramineae with its economic importance 8

(*b*) Explain in brief family–Dioscoraceae with its economic importance. 7

6. Write brief notes on : 15

(*a*) Interrelationship of family–pandnaceae 4

(*b*) Reproductive morphology of Papaveraceae 4

(*c*) Armen L. Takhtajan's classification 4

(*d*) Taxonomic Ranks. 3

This question paper contains **2** printed pages]

NEPWT—215—2024

FACULTY OF SCIENCE

M.Sc. (Second Year) (Third Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

BOTANY

SBOTE–501

(Fundamentals of Plant Pathology)

(Tuesday, 17-12-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—60

N.B. :— (*i*) Question No. **1** is compulsory.

(*ii*) Of the remaining, attempt any *three* questions.

(*iii*) Draw neat and labelled diagram wherever required.

1. Write brief notes on the following : 15

(*a*) Stages in disease development

(*b*) Antagonistic association

(*c*) Role of waxes and cuticle in defence mechanism.

(*d*) Mercury fungicides

P.T.O.

2. Write brief notes on the following :

(*a*) Non-parasitic diseases 8

(*b*) Seed and soil borne diseases. 7

3. Write brief notes on the following :

(*a*) Effect of humidity and soil pH on pathogenesis. 8

(*b*) Entry of plant pathogens through wounds and hydathodes. 7

4. Write brief notes on the following :

(*a*) Post-infectional biochemical defence through induced synthesis of proteins and enzymes. 8

(*b*) Structural defence in plants through epidermal cell wall and mechanical tissue. 7

5. Write brief notes on the following :

(*a*) Eradication 8

(*b*) Inorganic sulphur fungicides and their mode of action. 7

6. Write brief notes on the following : 15

(*a*) Diagnosis of plant diseases

(*b*) Direct penetration of plant pathogens

(*c*) Abscission layer

(*d*) Antibiotics in plant disease control.

This question paper contains **2** printed pages]

NEPWT—05—2024

FACULTY OF SCIENCE & TECHNOLOGY

M.Sc. (NEP) (Second Year) (Third Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

BOTANY

(Plant Physiology)

Paper SBOTC-501

(Tuesday, 10-12-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—80

N.B. :— (*i*) Q. No. **1** is compulsory.

(*ii*) Of the remaining, attempt any *three* questions.

(*iii*) Draw neat and labelled diagram wherever required.

1. Write brief notes on the following : 20

(*a*) Practical applications of Auxin 5

(*b*) Process of Osmosis and its role in plant life 5

(*c*) Ultrastructure of Chloroplast 5

(*d*) Lactic acid fermentation 5

P.T.O.

2. Write brief notes on the following 20

(*a*) Define transpiration and comment on starch-sugar interconversion theory. 10

(*b*) Physicochemical properties of water and its importance in plant life. 10

3. Write brief notes on the following : 20

(*a*) Causes of Seed Dormancy 10

(*b*) What is tropic plant movement ? Write note on its types. 10

4. Write brief notes on the following : 20

(*a*) Z-Scheme 10

(*b*) CAM Pathway 10

5. Write brief notes on the following : 20

(*a*) Glycolysis 10

(*b*) Pentose Phosphate Pathway. 10

6. Write brief notes on the following : 20

(*a*) Concept of Water Potential 5

(*b*) Ultra-structure of Mitochondria 5

(*c*) Concept of two pigment system 5

(*d*) Properties of Phytochromes. 5

This question paper contains **2** printed pages]

NEPWT—71—2024

FACULTY OF SCIENCE

M.Sc. (Second Year) (Third Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

(NEP-2020)

BOTANY

SBOTC-502

(Molecular Biology and Biostatistics)

(Thursday, 12-12-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—80

N.B. :— (*i*) Question No. **1** is compulsory.

(*ii*) Of the remaining, attempt any *three* questions.

(*iii*) Draw neat and labelled diagrams wherever necessary.

1. Write brief notes on the following (All modules) : 20

   (*a*) Cot curves

   (*b*) Exons and Introns

   (*c*) 5'-Cap formation

   (*d*) Mean and Median.

2. Write brief notes on the following :

   (*a*) Structure and chemical properties of nucleic acid. 10

   (*b*) Prokaryotic transcription. 10

P.T.O.

3. Write brief notes on the following :

(*a*) Mechanism of eukaryotic DNA replication. 10

(*b*) Operon concept and types. 10

4. Write brief notes on the following :

(*a*) Processing of *t*RNA. 10

(*b*) Post-translational modifications. 10

5. Write brief notes on the following :

(*a*) Measures of central tendency. 10

(*b*) Difference between parametric and non-parametric statistics. 10

6. Write brief notes on the following : 20

(*a*) Thermal properties of nucleic acids

(*b*) Origin of replication

(*c*) Genetic code

(*d*) Normal Distribution.

This question paper contains **2** printed pages]

NEPWT—216—2024

FACULTY OF SCIENCE

M.Sc. (Second Year) (Third Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

BOTANY

SBOTE–503

(Seed Technology-I)

(Tuesday, 17-12-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—60

N.B. :— (*i*) *All* questions carry equal marks.

(*ii*) Question No. **1** is compulsory.

(*iii*) Solve any **3** questions out of 5.

(*iv*) Draw neat and well labelled diagrams wherever required.

1. Write brief notes on :

(*a*) Pollination 4

(*b*) Seed Vigour 4

(*c*) Paul Neergaard 4

(*d*) Aschocyta blight of gram 3

P.T.O.

2. (*a*) Describe exomorphic and endomorphic characters of seed. 8

(*b*) What is seed dormancy ? Describe its types and importance. 7

7

3. (*a*) Define seed viability. Describe methods of testing of seed viability. 8

(*b*) Explain physical purity test by number and weight of seeds. 7

4. (*a*) Describe significance and environmental factors affecting seed infections.

8

(*b*) Explain general characters of Alternaria and Penicillium. 7

5. (*a*) Explain in detail symptoms, causal organism, disease cycle of Ergot of Bajra. 8

(*b*) Explain in detail symptoms, causal organism, disease cycle of Powdery mildew of Pea. 7

6. Write brief notes on :

(*a*) Parthenocarpy 4

(*b*) Causes of seed deterioration 4

(*c*) Cercospora 4

(*d*) Ear cockle 3

This question paper contains **2** printed pages]

NEPWT—137—2024

FACULTY OF SCIENCE

M.Sc. (Second Year) (Third Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

(NEP-2020)

BOTANY

Paper–SBOTC-503

(Pharmacognosy and Phytochemistry)

(Saturday, 14-12-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—60

N.B. :— (*i*) Question No. **1** compulsory.

(*ii*) Of the remaining attempt any *three* questions.

(*iii*) Draw neat and well labelled diagrams wherever necessary.

1. Write brief notes on the following : 15

(*a*) Evaluation of crude drugs. 4

(*b*) Medicinal plant conservation. 4

(*c*) Volatile oils. 4

(*d*) Properties flavonoids. 3

P.T.O.

2. Describe in detail the following : 15

(*a*) Morphological classification of crude drugs. 8

(*b*) Drug evaluation. 7

3. Describe in detail the following : 15

(*a*) Factors influencing cultivation of medicinal plants. 8

(*b*) Cytokinins and their application. 7

4. Describe in detail the follwoing : 15

(*a*) Role of pharmacognosy in Ayurveda. 8

(*b*) Alkaloids. 7

5. Describe in detail the following : 15

(*a*) Proteolytic enzymes. 8

(*b*) Chaulmoogra oil and Wool Fat. 7

6. Write brief notes on the following : 15

(*a*) History of pharmacognosy 4

(*b*) Mutation with reference to medicinal plants 4

(*c*) Chinese systtems of medicine 4

(*d*) Source and preservation of Agar. 3