

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

NEPKR—01—2026

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2026

RESEARCH METHODOLOGY (Compulsory)

Paper NEPRM-1001

(Thursday, 16-4-2026)

Time : 10.00 a.m. to 12.00 noon

Time—2 Hours

Maximum Marks—45

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

(2) Solve any *two* questions from Q. No. 2 to Q. No. 5.

(3) Calculator and log table is allowed.

1. Write notes on :

5×3=15

(a) Research motive

(b) Need of research design

(c) Coding processing operation

(d) Statistical techniques in research

(e) Variables.

P.T.O.

2. (a) Explain in detail various steps involved in research process. 8
- (b) What is research hypothesis ? Give their characteristics. 7
3. (a) Give an account on good research design. 8
- (b) Describe types of research. 7
4. (a) Calculate the mean, median and mode of the following data : 8
- 3, 6, 3, 7, 4, 3, 9.
- (b) Describe interview method for the collection of primary data. 7
5. (a) Calculate the chi-square (χ^2) value of the following data : 8

Fully Agree	Not Sure	Not Agree	Total
102	108	28	238

- (b) Write an essay on case study. 7

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NEPKR—59—2026

FACULTY OF SCIENCE

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

APRIL/MAY, 2026

BOTANY

(SBOTC-401)

(Diversity of Microbes)

(Saturday, 18-4-2026)

Time : 10.00 a.m. to 12.30 p.m.

Time—2½ Hours

Maximum Marks—60

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

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

(3) Draw neat and labelled diagram wherever required.

1. Write brief notes on the following : 15

(a) Structure of Endospore

(b) General characters of Mycoplasma

(c) Structure of alternaria spore

(d) Medicinal uses of Mushroom

(e) Structure of Heteromorous lichen thallus.

2. Write brief notes on the following : 15

(a) Explain structure of VAM. 8

(b) Biological control of pest. 7

P.T.O.

3. Write brief notes on the following : 15
- (a) Describe structure of perithecium in ascomycetes. 8
 - (b) Endogenous spores in Fungi. 7
4. Write brief notes on the following : 15
- (a) Structure of TMV 8
 - (b) Leaf curl of Papaya. 7
5. Write brief notes on the following : 15
- (a) Transformation in Bacteria. 8
 - (b) Soft rot of potato. 7
6. Write brief notes on the following (any *three*) : 15
- (a) Fungi in food processing 5
 - (b) Early blight of tomato 5
 - (c) Economic importance of virus 5
 - (d) Conjugation in Bacteria. 5

This question paper contains 2 printed pages]

NEPKR—159—2026

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2026

BOTANY

Paper SBOTC-402

(Diversity of Cryptogams)

(Tuesday, 21-4-2026)

Time : 10.00 a.m. to 12.30 p.m.

Time—2½ 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 necessary.

1. Write brief notes on the following :

15

(a) Algal habitat

(b) Morphology of Rhodophyta

(c) Economic importance of Bryophytes

(d) General characters of Pteridophytes

(e) *Psilotum*.

P.T.O.

2. Write brief notes on the following :
- (a) F. E. Fritsch's classification of algae 8
 - (b) Algal pigments. 7
3. Write brief notes on the following :
- (a) General morphology and asexual reproduction in Phaeophyta. 8
 - (b) Sexual reproduction in Xanthophyta. 7
4. Write brief notes on the following :
- (a) Morphological and anatomical characters of sphagnales. 8
 - (b) Internal structure of Marchantiales. 7
5. Write brief notes on the following :
- (a) Morphological and anatomical characters of *Lycopodium* sporophyte. 8
 - (b) Heterospory and seed habit. 7
6. Write brief notes on the following (any *three*) : 15
- (a) Reserve food in algae
 - (b) Morphology of Chrysophyta
 - (c) Distribution of Bryophytes
 - (d) Geological Time Scale
 - (e) Economic importance of Pteridophytes.

This question paper contains 2 printed pages]

NEPKR—269—2026

FACULTY OF SCIENCE

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

APRIL/MAY, 2026

(NEP-2020 Pattern)

BOTANY

Paper—SBOTC-403

(Taxonomy of Angiosperms and Gymnosperms)

(Thursday, 23-4-2026)

Time : 10.00 a.m. to 12.30 p.m.

Time—2½ 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 brief notes on the following : 15
 - (a) Classification of Gymnosperms by S.P. Bhatnagar and Alok Moitra (1996) 3
 - (b) Principles of taxonomy 3
 - (c) Salient features of family Malvaceae 3
 - (d) OTUs 3
 - (e) Economic importance of family Orchidaceae. 3

P.T.O.

2. Write brief notes on : 15
- (a) General account on Pteridospermales. 8
 - (b) Sporophytes and Gametophyte of Cycadales. 7
3. Write brief notes on : 15
- (a) Important rules of ICNafp. 8
 - (b) Allopatric and Sympatric speciation. 7
4. Write brief notes on : 15
- (a) Linnaeus system of plant classification with merit and demerits. 8
 - (b) Give detailed account of family Apiaceae. 7
5. Write brief notes on : 15
- (a) Chemotaxonomy. 8
 - (b) Biosystematics. 7
6. Write brief notes on (any *three*) : 15
- (a) General characters of Gymnosperms 5
 - (b) Principles of ICNafp 5
 - (c) Merits and demerits of Bentham and Hooker's classification 5
 - (d) RAPD. 5

This question paper contains 2 printed pages]

NEPKR—29—2026

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2026

BOTANY

SBOTC-1451

(Cell Biology, Genetics and Plant Breeding)

(Friday, 17-4-2026)

Time : 10.00 a.m. to 12.30 p.m.

Time—2½ Hours

Maximum Marks—60

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 :

15

(a) Euchromatin

(b) Linkage

(c) Cytoplasmic inheritance

(d) Self-pollination

(e) Pachytene.

P.T.O.

2. Write brief notes on the following :
- (a) Structure and functions of chloroplast. 8
 - (b) Describe cell cycle and its regulation. 7
3. Write brief notes on the following :
- (a) Explain complementary gene interaction with suitable example. 8
 - (b) Explain post-Mendelian genetics. 7
4. Write brief notes on the following :
- (a) Describe cytoplasmic inheritance with reference to mitochondria. 8
 - (b) Regulation of gene expression in Prokaryotes. 7
5. Write brief notes on the following :
- (a) Mechanism and applications of incompatibility in plant breeding. 8
 - (b) Describe mutation breeding and its role in plant breeding. 7
6. Write notes on (any *three*) : 15
- (a) Prokaryotic cell
 - (b) Epistasis
 - (c) Genetic drift
 - (d) Male sterility.

This question paper contains 2 printed pages]

NEPKR—109—2026

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2026

(NEP-2020)

BOTANY

Paper SBOTC-1452

(Plant Resource Utilization and Biodiversity Conservation)

(Monday, 20-4-2026)

Time : 10.00 a.m. to 12.30 p.m.

Time—2½ Hours

Maximum Marks—60

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 :

15

(a) Medicinal and Aromatic plants

(b) Species diversity

(c) Mangroves

(d) Chipko movement

(e) Pollen Bank.

P.T.O.

2. Write brief notes on :
- (a) Plant as a source of edible oils. 8
 - (b) Vavilov's centres of origin. 7
3. Write brief notes on :
- (a) Give in detailed account on concept of Biodiversity. 8
 - (b) Describe the concept and types of Endemism. 7
4. Write brief notes on :
- (a) Describe in detail Green Revolution. 8
 - (b) In situ conservation strategies. 7
5. Write brief notes on :
- (a) Role of Department of Biotechnology in sustainable development. 8
 - (b) Botanical Garden and seed banks. 7
6. Write brief notes on (any *three*) :
- (a) Dye yielding plants 5
 - (b) Red data book 5
 - (c) Principles of conservation 5
 - (d) Ex-situ conservation of microbes. 5

This question paper contains 2 printed pages]

NEPKR—210—2026

FACULTY OF SCIENCE

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

APRIL/MAY, 2026

BOTANY

(SBOTC-1453)

(Plant Anatomy and Embryology of Angiosperm)

(Wednesday, 22-4-2026)

Time : 10.00 a.m. to 12.30 p.m.

Time—2½ Hours

Maximum Marks—60

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 :

15

(a) Importance and scope of plant anatomy

(b) Structure of stomata

(c) Synergids

(d) Role of palynology in taxonomy

(e) Xylem.

P.T.O.

2. Write brief notes on the following : 15
- (a) Organization of root apical meristem. 8
 - (b) Explain primary growth of stem. 7
3. Write brief notes on the following : 15
- (a) Structure and types of stomata. 8
 - (b) Explain secretory tissue types. 7
4. Write brief notes on the following : 15
- (a) Development of male gametophyte. 8
 - (b) Explain double fertilization. 7
5. Write brief notes on the following : 15
- (a) NPC classification in pollen. 8
 - (b) Pollen analysis and pollen germination. 7
6. Write brief notes on the following (any *three*) : 15
- (a) Types of vegetative shoot apex 5
 - (b) Structure and types of trichomes 5
 - (c) Triple fusion 5
 - (d) Allergic properties of pollen. 5

This question paper contains 2 printed pages]

NEPKR—6—2026

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2026

(NEP 2020 Pattern)

BOTANY

(SBOTC-501)

(Plant Physiology)

(Thursday, 16-4-2026)

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) Solve any *three* of the remaining five Q. No. 2 to Q. No. 6.

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

1. Write brief notes on the following :

20

(a) Imbibition

(b) Vernalization

(c) RUBISCO

(d) Structure of mitochondria.

P.T.O.

2. Write brief notes on the following :
 - (a) Phloem loading. 10
 - (b) Theories and mechanism of stomatal transpiration. 10
3. Write brief notes on the following :
 - (a) Causes and methods of breaking seed dormancy. 10
 - (b) Applications of Gibberellins. 10
4. Write short notes on the following :
 - (a) CAM-pathway 10
 - (b) Cyclic photophosphorylation. 10
5. Write brief notes on the following :
 - (a) EMP pathway 10
 - (b) Electron transport system. 10
6. Write brief notes on the following : 20
 - (a) Source and sink relationship
 - (b) Abscisic acid
 - (c) Chloroplast
 - (d) Fermentation.

This question paper contains 2 printed pages]

NEPKR—60—2026

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2026

(NEP-2020 Pattern)

BOTANY

(SBOTC-502)

(Molecular Biology and Biostatistic)

(Saturday, 18-4-2026)

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 well labelled diagram wherever necessary.

1. Write short notes on :

20

(i) Forms of DNA

(ii) DNA polymerases

(iii) Bacterial growth

(iv) Types of errors

P.T.O.

2. Describe the following in detail : 20
- (i) Positive and negative transcriptional regulation.
 - (ii) Types of repetitive DNA.
3. Describe the following in detail : 20
- (i) Mechanism of prokaryotic DNA replication.
 - (ii) Organization and structure of eukaryotic genes.
4. Describe the following in detail : 20
- (i) Mechanism of protein synthesis.
 - (ii) Genetic conjugation and transduction in bacteria.
5. Describe the following in detail : 20
- (i) Mean deviation and standard deviation.
 - (ii) Measures of central tendency and dispersal.
6. Write short notes on : 20
- (i) Physical properties of nucleic acids
 - (ii) Structure and role of exons
 - (iii) Transposons
 - (iv) Sampling distribution.

This question paper contains 2 printed pages]

NEPKR—160—2026

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2026

(NEP Pattern)

BOTANY

Paper—SBOTC-503

(Pharmacognosy and Phytochemistry)

(Tuesday, 21-4-2026)

Time : 2.00 p.m. to 4.30 p.m.

Time—2½ 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 necessary.

- | | |
|-----------------------------------------|----|
| 1. Write short notes on the following : | 15 |
| (i) Resins | 4 |
| (ii) Hybridization | 4 |
| (iii) Chinese systems of medicine | 4 |
| (iv) Glycosides. | 3 |

P.T.O.

2. Describe the following in detail : 15
- (i) Chemical classification of drugs. 8
 - (ii) Dried latex and dried juices as unorganized drugs. 7
3. Describe the following in detail : 15
- (i) Plant hormones and their applications. 8
 - (ii) Plant hormones and their applications. 7
4. Describe the following in detail : 15
- (i) Properties and test for identification of Flavonoids. 8
 - (ii) Properties and test for identification of Alkaloids. 7
5. Describe the following in detail : 15
- (i) Therapeutic used and commercial utility of carbohydrates from Agar. 8
 - (ii) Therapeutic used and commercial utility of Lipids from Bees Wax. 7
6. Write brief notes on the following : 15
- (i) History of Pharmacognosy
 - (ii) Polyploidy with reference to medicinal plants
 - (iii) Ayurveda
 - (iv) Tannins.

Total No. of Printed Pages:02

SUBJECT CODE NO- NEPKR-45-2026
FACULTY OF SCIENCE AND TECHNOLOGY
EXAMINATION SUMMER 2026
M.SC. (SECOND YEAR) (SEM-IV)
RESEARCH PUBLICATION ETHICS
NEPRPE-1002

[Time: 2:00 Hours]

[Max. Marks:40]

“Please check whether you have got the right question paper.”

- N.B. (i) Question No. 1 is compulsory.
(ii) Solve any three questions from Question number 2 to 6

Q1. Write note on:**10**

- a) Scope of philosophy.
- b) Principles of good scientific practices.
- c) Objective of publishing paper.
- d) Open access publication.
- e) International standard book number.

Q2. a) Write briefly on any two branches of philosophy.**5**

- b) Explain common form of scientific misconduct.

5**Q3. a) What constitute a violation of publication ethics?****5**

- b) Mention various steps of Sherpa Romeo online resource to view detail of journal.

5**Q4. a) What are the characteristics of predatory journals?****5**

- b) What is i_{10} index? calculate the i_{10} index of following citation.

5

Rank	Citation
1	29
2	26
3	15
4	14
5	12
6	11
7	11
8	09
9	06

- Q5.** a) Define publication ethics. Discuss unethical practices prevalent in research publications. **5**
b) What is plagiarism? Explain its types and importance in research. **5**

Q6. Explain:

- a) Types of ethics. **10**
b) Salami slicing
c) Elsevier
d) Turnitin

This question paper contains 2 printed pages]

NEPKR—110—2026

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2026

BOTANY

Paper SBOTC-551

(Biochemistry and Plant Metabolism)

(Monday, 20-4-2026)

Time : 2.00 p.m. to 5.00 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) Deamination

(b) Co-factors

(c) Nitrogenase enzyme

(d) Starch.

2. Write brief notes on the following :

(a) Mechanism of transcription. 10

(b) Tertiary and Quaternary structure of protein. 10

P.T.O.

3. Write brief notes on the following :
- (a) Michaelis-Menten equation for enzyme kinetics. 10
 - (b) Coenzymes and cofactors. 10
4. Write brief notes on the following :
- (a) Role and sources of nitrogen in plants. 10
 - (b) Biological nitrogen fixation. 10
5. Write brief notes on the following :
- (a) Structure and biological role of cellulose and chitin. 10
 - (b) Structure and chemical properties of monosaccharides. 10
6. Write brief notes on the following : 20
- (a) Essential and non-essential amino acids
 - (b) Ribozymes
 - (c) Leghaemoglobin
 - (d) Glycosidic bond.

This question paper contains 2 printed pages]

NEPKR—211—2026

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2026

(NEP-2020 Pattern)

BOTANY

SBOTC-552

(Biotechnology and Genetic Engineering)

(Wednesday, 22-4-2026)

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 diagram wherever necessary.

1. Write brief notes on the following :

20

(a) Culture media

(b) Synthetic seeds

(c) Restriction digestion

(d) Cosmids

P.T.O.

2. Write brief notes on the following :
- (a) Stages in micropropagation. 10
 - (b) Aseptic culture techniques. 10
3. Write brief notes on the following :
- (a) Isolation and methods of protoplast culture. 10
 - (b) Ovute culture and its application. 10
4. Write brief notes on the following :
- (a) Basic techniques in molecular genetics. 10
 - (b) Genome sequencing strategies. 10
5. Write brief notes on the following :
- (a) Small RNAs and their biogenesis. 10
 - (b) Nucleic acid modifying enzymes. 10
6. Write brief notes on the following : 20
- (a) Totipotency
 - (b) Protoplast fusion
 - (c) CDNA libraries
 - (d) Plasmids