Total No. of Printed Pages:02

SUBJECT CODE NO- NEPHR-01-2025

FACULTY OF SCIENCE AND TECHNOLOGY

EXAMINATION WINTER 2025

M.SC (FIRST YEAR) (SEM-I)

COMMON PAPER

SVECRM-401-RESEARCH METHODOLOGY(COMPULSORY)

[Time: 3:00 Hours] **[Max.Marks:45]**

"Please check whether you have got the right question paper."

N.B.
1. Question No. 1 is Compulsory.
2. Solve any TWO questions from Question No. 2 to 5.
3. Calculator and log table allowed.

Q.1 Write notes on: **5X3=15**

1. Research objectives
2. Features of good research designing
3. Editing processing operations
4. statistical measures in research
5. Variables

Q.2 1. Describe various steps involved in research. **08**

2. Explain types of research hypothesis. **07**

Q.3 1. Explain meaning and need of good research designing. **08**

2. Describe descriptive and fundamental types of research. **07**

Q.4 1. Calculate, mean, median and mode of the following data. **08**

Class Interval (CI)	Frequency (F)
50-54	2
45-49	5
40-44	8
35-39	7
30-34	10
25-29	5
20-24	9
15-19	2
10-14	1
5-9	1

2. Describe observation method for collection of primary data. **07**

Q.5 1. calculate chi square (x^2) value of the following data. **08**

Excellent	Average	Poor	Total
58	32	30	120

2. Explain in detail case study. **07**

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

NEPHR—56—2025

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2025

BIOTECHNOLOGY

Paper SBTTC-401

(Cell and Developmental Biology)

(Monday, 15-12-2025) **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*) From remaining solve any *three* questions.

(*iii*) Draw neat diagram wherever necessary.

1. Write short notes on (any *three*) : 3×5=15

(*a*) Microfilaments

(*b*) Diffusion

(*c*) Prophase-I

(*d*) Blastulation

P.T.O.

2. (*a*) Describe in brief structure and function of chloroplast. 8

(*b*) Explain in detail structure and function of Lysosomes. 7

3. (*a*) What is GPCR ? Explain it in detail. 8

(*b*) Write a note on Integrins. 7

4. (*a*) Describe in detail Mitosis. 8

(*b*) Explain in brief Apoptosis. 7

5. (*a*) What is Gametogenesis ? Write a note on spermatogenesis. 8

(*b*) Define Gastrulation. Add a note on three germ layer formation in animals. 7

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

(*a*) Prokaryotic cell

(*b*) Interaction of cancer cell with normal cell

(*c*) Oncogenes

(*d*) Cleavages.

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

NEPHR—258—2025

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2025

(NEP 2020)

BOTANY

(SBOTL-403)

(Taxonomy of Angiosperms and Gymnosperms)

(Monday, 22-12-2025) **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 required.

1. Write brief notes on the following : 15

(*a*) Classification of Gymnosperm by Prof Birbal Sahni (1920). 3

(*b*) Taxonomic structure. 3

(*c*) General characters of Poaceae. 3

(*d*) Cluster analysis. 3

(*e*) Economic importance of family Euphorbiaceae. 3

P.T.O.

2. Write brief notes on :

(*a*) General account on Pentoxylales. 8

(*b*) Sporophyte and gametophyte of Gnetales. 7

3. Write brief notes on :

(*a*) Theories of origin of Angiosperms. 8

(*b*) Allopatric and sympatric speciation. 7

4. Write brief notes on : 15

(*a*) Engler and Prantl's classification with its merits and demerits. 8

(*b*) Give a detailed account on family Annonaceae. 7

5. Write brief notes on : 15

(*a*) Molecular systematics. 8

(*b*) Chemotaxonomy. 7

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

(*a*) Economic importances of Gymnosperms. 5

(*b*) Biological species concept. 5

(*c*) Merits and demerits of Bentham and Hooker's classification. 5

(*d*) Categories of Biosystematics. 5

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

NEPHR—452—2025

FACULTY OF SCIENCE AND TECHNOLOGY

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

NOVEMBER/DECEMBER, 2025

BIOTECHNOLOGY

SBTTE-401

(Techniques in Biotechnology)

(Wednesday, 24-12-2025) **Time : 10.00 a.m. to 12.00 noon**

Time— 2 *Hours* *Maximum Marks*—45

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

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

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

1. Write short notes of the following : 15

(*a*) Fluorescence microscope

(*b*) Ion exchange chromatography

(*c*) X-ray spectroscopy

(*d*) Measurement of radioactivity based on gas ionization.

(*e*) Raman spectroscopy.

P.T.O.

2. (*a*) What is centrifuge ? Explain various types of rotors. 8

(*b*) Explain principle and working of scanning electron microscope. 7

3. (*a*) What is paper chromatography ? Explain paper chromatography along with its types. 8

(*b*) Give general principles of electrophoresis and explain agarose gel electrophoresis. 7

4. (*a*) Explain in detail, circular dichroism spectroscopy. 8

(*b*) Explain UV-visible spectroscopy. 7

5. (*a*) What is ELISA ? Describe different types of ELISA. 8

(*b*) Explain in brief scintillation counting methods. 7

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

NEPHR—453—2025

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2025

BIOTECHNOLOGY

(Plant Metabolism and Development)

(Wednesday, 24-12-2025) **Time : 10.00 a.m. to 12.00 noon**

Time— 2 *Hours* *Maximum Marks*—45

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

(*ii*) Attempt any *two* questions of remaining questions.

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

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

(*a*) Properties of water

(*b*) Abscisic acid

(*c*) Mechanism of active absorption

(*d*) Endosperm Embryo

(*e*) Theory of absorption of mineral salt.

P.T.O.

2.	(*a*)	Explain theory of diffusion.	8
	(*b*)	Explain mode of action of some herbicides.	7
3.	(*a*)	Explain gene regulation photoperiodism.	8
	(*b*)	Explain guard cell osmoregulation.	7
4.	(*a*)	Explain role of cytokinin in plant physiology.	8
	(*b*)	Write a note on C4 pathway in photosynthesis.	7
5.	(*a*)	Explain mitochondrial electron transport.	8
	(*b*)	Describe structure of ovule.	7

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

NEPHR—151—2025

FACULTY OF SCIENCE AND TECHNOLOGY

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

NOVEMBER/DECEMBER, 2025

BIOTECHNOLOGY

(SBTTC-402)

(Microbiology and Virology)

(Wednesday, 17-12-2025) **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*) Solve any *three* questions from Q. No. **2** to Q. No. **6**.

1. (*a*) Write a short note on Rickettsia and Mycobacterium. 3

(*b*) Effect of water and oxygen availability on bacterial growth. 3

(*c*) Structure of viruses. 3

(*d*) Write on classification of autotrophs. 3

(*e*) Virus infectivity assay–plaque assay. 3

P.T.O.

2. (*a*) Discuss the controvery over spontaneous generation. 8

(*b*) Describe purple and green bacteria. 7

3. (*a*) Explain the principles of microbial nutrition along with *one* example. 8

(*b*) Write a note on evolution of earth and earliest life forms with their metabolic strategies. 7

4. (*a*) Derive mathematical expression of bacterial growth. 8

(*b*) Describe synchronous growth and its application. 7

5. (*a*) Explain the lytic cycle of virus replication. Add a note on nomenclature. 8

(*b*) Describe in brief on cultivation of viruses in embryonated egg. 7

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

(*a*) Gliding and sheathed bacteria

(*b*) Measurement of growth and growth yields

(*c*) PCR based diagnosis of viruses

(*d*) Ribotyping.

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

NEPHR—255—2025

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2025

(NEP 2020)

BIOTECHNOLOGY

Paper SBTTC-403

(Biochemistry)

(Monday, 22-12-2025) **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*) From remaining attempt any *three*.

(*iii*) *All* questions carry equal marks.

(*iv*) Represent your answers with well labelled diagrams wherever necessary.

1. Write notes on : 3×5=15

(*a*) Ionic product of water

(*b*) Glycolipids

P.T.O.

(*c*) Isoenzymes

(*d*) DNA supercoiling

(*e*) α-helix

2. (*a*) Describe in detail biological buffers. 8

(*b*) Explain Henderson-Hasselbach equation. 7

3. (*a*) Describe in detail heteropolysaccharides. 8

(*b*) Describe structure and functions of phospholipids. 7

4. (*a*) Describe classification of amino acids. 8

(*b*) Describe in detail classification of proteins based on shape and composition. 7

5. (*a*) Explain different forms of DNA. 8

(*b*) Describe structure and functions of types of RNA. 7

6. Write notes on (any *three*) : 15

(*a*) Chemical bonds

(*b*) Vitamin A

(*c*) Peptides

(*d*) Nucleotides.

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

NEPHR—28—2025

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2025

BIOTECHNOLOGY

Paper SBTTC-451

(Molecular Genetics)

(Saturday, 13-12-2025) **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*) From remaining questions solve any *three* questions.

(*iii*) Draw neat diagram wherever necessary.

1. Write short notes on any *three* : 3×5=15

(*a*) Duplicate genes

(*b*) Nucleosome

(*c*) DNA as a genetic material

(*d*) Genetic code

(*e*) RNA polymerase.

P.T.O.

2. (*a*) Describe in detail transformation. 8

(*b*) Explain in brief epistasis. 7

3. (*a*) Write a note on variation in chromosome structure. 8

(*b*) Describe in brief genome organization in prokaryotes. 7

4. (*a*) What is replication ? Describe in detail prokaryotic replication. 8

(*b*) Explain in detail post-transcriptional RNA processing. 7

5. (*a*) What is operon ? Describe in detail Lac operon. 8

(*b*) Explain in detail tryptophan operon. 7

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

(*a*) Codominance

(*b*) Types of chromosome

(*c*) SOS repair mechanism

(*d*) Ribosome.

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

NEPHR—105—2025

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2025

BIOTECHNOLOGY

(SBTTC-452)

(Immunotechnology)

(Tuesday, 16-12-2025) **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*) Hematopoiesis

(*b*) B-cells

(*c*) TCR

(*d*) FACS

(*e*) Flow cytometry.

P.T.O.

2. (*a*) Discuss the cells of immune system. 8

(*b*) Write a note on primary lymphoid organs. 7

3. (*a*) Discuss classical complement pathway. 8

(*b*) Write a note on hypersensitivity. 7

4. (*a*) Explain organ specific autoimmune diseases. 8

(*b*) Write a note on types of Graft and mechanism of Graft rejections. 7

5. (*a*) Discuss primary immunodeficiency with examples. 8

(*b*) Discuss agglutination reaction with example. 7

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

(*a*) Antigen

(*b*) Antibodies

(*c*) ELISA

(*d*) AIDS.

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

NEPHR—351—2025

FACULTY OF SCIENCE

M.Sc. (Second Semester) EXAMINATION

NOVEMBER/DECEMBER, 2025

BIOTECHNOLOGY

(Nanobiotechnology)

(Tuesday, 23-12-2025) **Time : 10.00 a.m. to 12.00 noon**

Time— 2 *Hours* *Maximum Marks*—45

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

(*ii*) Attempt any *two* questions from remaining questions (Q. No. **2** to Q. No. **5**).

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

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

(*a*) Nanoscale dimension

(*b*) Nanoparticles

(*c*) Application nano-material in agriculture.

(*d*) Lipid nanoparticles

(*e*) Application of nano-material in medicine.

P.T.O.

2.	(*a*)	Describe types of nanomaterial and their applications.	8
	(*b*)	Write a note on quantum dot and wire.	7
3.	(*a*)	Write a note on chemical foundation of nano-particles.	8
	(*b*)	Explain MEMS based on nano-materials.	7
4.	(*a*)	Explain lipid nano-particles for drug delivery.	8
	(*b*)	Write a note on inorganic nano-particles for drug delivery.	7
5.	(*a*)	Describe making of metal oxide nano-particles.	7
	(*b*)	Write a note on application of nano-material in environmental protection.	8

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

NEPHR—05—2025

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2025

BIOTECHNOLOGY

Paper SBTTC-501

(Genetic Engineering)

(Friday, 12-12-2025) **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*) From remaining attempt any *three*.

(*iii*) *All* questions carry equal marks.

(*iv*) Represent your answers with well labelled diagrams wherever necessary.

1. Write notes on : 20

(*a*) Ti-plasmid

(*b*) Southern blotting

(*c*) Recombinant vaccine

(*d*) Transgenic plants.

P.T.O.

2.	(*a*)	Define restriction enzymes. Describe in detail types of R.E.	10
	(*b*)	Describe in detail microinjection and electroporation methods.	10
3.	(*a*)	Describe in detail non-radio active labelling of probes.	10
	(*b*)	Describe in detail C-DNA library preparation.	10
4.	(*a*)	Describe chemical methods of DNA sequencing.	10
	(*b*)	Describe in detail PCR with its applications.	10
5.	(*a*)	Describe in detail Gene therapy.	10
	(*b*)	Explain heterologous gene expression.	10
6.	Write notes on :		20
	(*a*)	YAC	
	(*b*)	Genomic library	
	(*c*)	Site directed mutagenesis	
	(*d*)	Transposon tagging.	

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

NEPHR—256—2025

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2025

BIOTECHNOLOGY

Paper SBTTE-501

(English and Science Communication Skills)

(Monday, 22-12-2025) **Time : 2.00 p.m. to 4.30 p.m.**

Time—2½ *Hours* *Maximum Marks*—60

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

(2) From the remaining (Q. No. **2** to Q. No. **6**) solve any *three*.

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

   (*a*) Feedback

   (*b*) Proxemics

   (*c*) Interpersonal Skills

   (*d*) Memos.

2. (*a*) Discuss the meaning and definition of communication and explain communication process. 8

P.T.O.

(*b*) Discuss how technological advancements have transformed communication in the carporate world. 7

3. (*a*) Discuss the characteristics of verbal communication and its significance of effective communication within an organization. 8

(*b*) Examine the significance of kinesics in non-verbal communication. 7

4. (*a*) Discuss importance of Listening skills and how we can cultivative good Listening skills ? 8

(*b*) How does effective time management contribute to productivity and work life balance ? 7

5. (*a*) What are notice, agenda and minutes of meetings ? 8

(*b*) Discuss content of formal reports. 7

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

(*a*) Horizontal communication

(*b*) Chronemics

(*c*) Stress Management

(*d*) Emails.

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

NEPHR—57—2025

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2025

BIOTECHNOLOGY

Paper SBTTC-502

(Industrial Biotechnology)

(Monday, 15-12-2025) **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*) From remaining solve any *three* questions.

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

1. Write short notes on : 15

(*a*) Ion exchange chromatography

(*b*) Glycerol

(*c*) Protaglandins

(*d*) Carcinogenicity

P.T.O.

2. (*a*) Explain membrane process methods for fermentation product. 10

(*b*) Describe in detail precipitation and filtration of cell mass removal. 10

3. (*a*) Describe production of L-Glutamic acid. 10

(*b*) Explain cellulase production and its application. 10

4. (*a*) Describe microbial transformation of steroids. 10

(*b*) Explain microbial transformation of L-Ascorbic acid. 10

5. (*a*) Describe purity testing of product. 10

(*b*) Explain fermentation economics. 10

6. Write short notes on : 20

(*a*) HPLC

(*b*) Xanthane

(*c*) PHB

(*d*) Pyrogen testing.

Total No. of Printed Pages:1

SUBJECT CODE NO:- NEPHR-44-2025
FACULTY OF SCIENCE & TECHNOLOGY
EXAMINATION WINTER 2025
M.Sc.(SECOND YEAR) (SEM –IV)
(COMMON PAPER)
RESEARCH PUBLICATION ETHICS (NEPPE - 1002)

[Time: 2:00 Hours] **[Max.Marks:40]**

"Please check whether you have got the right question paper."

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

Q1 Explain: **5×2=10**
a) Nature of philosophy
b) Intellectual honesty
c) World association of medical editor's.
d) Open access publications.
e) Web of Science

Q2 a) What do you mean by philosophy? Gives the IR branches. **2x5=10**
b) Write an essay on scientific misconduct.

Q3 a) Define publication ethics? Why publication of research paper is important. Explain. **2x5=10**
b) SHERPA / ROMEO is an excellent online resource. Explain.

Q4 a) What are predatory Journals? How to identify a predatory Journals! **2×5=10**
b) What is impact Factor? How it calculate? Explain it with suitable example.

Q5 a) Give an account on violation of publications ethics. **2x5=10**
b) What is plagiarism? Describe different software of plagiarism.

Q6 Write short notes on: **4×2.5=10**
a) Scope of ethics
b) Salami slicing
c) Springer
d) h-index

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

NEPHR—106—2025

FACULTY OF SCIENCE AND TECHNOLOGY

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

NOVEMBER/DECEMBER, 2025

BIOTECHNOLOGY

Paper SBTTC-551

(Computational Biology)

(Tuesday, 16-12-2025) **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 labelled diagram wherever necessary.

1. Write brief notes on the following : 4×5=20

(*i*) Literature databases

(*ii*) Disease diagnosis

(*iii*) Pharmacogenomics

(*iv*) Variance.

P.T.O.

2. Describe in detail the following : 2×10=20

(*i*) Application of Bioinformatics

(*ii*) Database Browsing and Data Retrieval.

3. Describe in detail the following : 2×10=20

(*i*) Protein structure prediction

(*ii*) 2D PAGE.

4. Describe in detail the following : 2×10=20

(*i*) Gene prediction

(*ii*) Microarrays and their applications.

5. Describe in detail the following : 2×10=20

(*i*) Mean deviation and standard deviation.

(*ii*) Tabulation of data and its graphical representation.

6. Write brief notes on the following : 4×5=20

(*i*) Structural databases

(*ii*) Mass spectrometry

(*iii*) Metagenomics

(*iv*) Mean and Mode.