This question paper contains **3** printed pages]

NEPSST—1—2025

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2025

(NEP 2020)

RESEARCH METHODOLOGY

Paper NEPRN-1001

(Wednesday, 16-4-2025) **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 solve any *three* questions.

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

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

(*a*) Qualities of good research.

(*b*) Features of good design.

(*c*) ANOVA

(*d*) Types of data.

2. (*a*) What is research ? Explain steps involved in research process. 8

(*b*) Discuss interview as a technique of data collection. 7

P.T.O.

3. (*a*) Calculate the Mean, Median and Mode of the following data : 8

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

(*b*) What is hypothesis ? Give the characteristics of good research hypothesis. 7

4. (*a*) Describe non-probability and probability sampling. 8

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

Excellent	Average	Poor	Total
58	32	30	120

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

(*b*) Explain extraneous variable. 7

6. Write short notes on : 15

(*a*) Descriptive types of research

(*b*) Non-parametric test

(*c*) Primary data sources.

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

NEPSST—82—2025

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2025

MICROBIOLOGY

Paper SMICC-401

(Microbial Diversity and Evolution)

(Saturday, 19-4-2025) **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 labelled diagram wherever required.

1. Write brief notes on the following : 20

(*a*) Chemotaxonomy

(*b*) Thermoproteales

(*c*) Purple phototrophic bacteria

(*d*) Defferibacter.

2. (*a*) Take a detailed account of Endosymbiosis theory and its role in origin of Eukaryotes. 10

(*b*) Describe in detail methods for determining evolutionary relationship. 10

P.T.O.

3. (*a*) Take a detailed account of energy and metabolism in crenarchaeota. 10

(*b*) Discuss in detail phylum Euryarchaeota. 10

4. (*a*) Discuss in detail phylum Proteobacteria. 10

(*b*) Describe in brief phylum Cyanobacteria and Prochlorophytes. 10

5. (*a*) Describe in detail phylum Cytophoga. 10

(*b*) Discuss deep branching of hyperthermophiles with examples. 10

6. Write brief notes on the following : 20

(*a*) Ribosomal RNA sequencing

(*b*) Heat stable biomolecules

(*c*) Iron and sulphur oxidizing bacteria

(*d*) Green sulfur bacteria.

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

NEPSST—178—2025

FACULTY OF SCIENCE & TECHNOLOGY

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

APRIL/MAY, 2025

(Old Pattern)

MICROBIOLOGY

Paper SMICC 402

(Advance Techniques in Microbiology)

(Tuesday, 22-4-2025) **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 diagrams wherever necessary.

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

   (*a*) CD

   (*b*) Western blotting

   (*c*) Oscimium tetraoxide

   (*d*) Classification matching.

2. (*a*) Describe in detail the principle and procedure of Gas Chromatography. 10

   (*b*) Discuss in detail density gradient centrifuge. 10

P.T.O.

3. (*a*) Write down a process of Southern blotting technique. 10

(*b*) Describe in detail principle and technique of Agarose gel electrophoresis. 10

4. (*a*) Describe in detail working, principle and application of TEM. 10

(*b*) Take a detailed account of fluorescent microscopy. 10

5. (*a*) Explain in detail technique used in Mass Spectroscopy. 10

(*b*) Describe in detail application of AI (Artificial intelligence). 10

6. Write brief notes on the following (covering all modules) : 20

(*a*) Rate zonal centrifuge

(*b*) 2D-gel electrophoresis

(*c*) Negative staining

(*d*) Microbial characterization.

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

NEPSST—300—2025

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2025

MICROBIOLOGY

Paper SMICC-403

(Microbial Physiology & Metabolism)

(Thursday, 24-4-2025) **Time : 10.00 a.m. to 1.00 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 well labelled diagram wherever necessary.

1. Write brief notes on the following : 20

   (*a*) Oxidative phosphorylation

   (*b*) Kelvin cycle

   (*c*) Biosynthesis of purines

   (*d*) Nitrification

2. (*a*) Describe in detail ATP synthesis. 10

   (*b*) Explain the major steps involved in glycolysis and the pentose phosphate pathway. 10

P.T.O.

3. (*a*) Explain the process of electron transport and proton pumping in thylakoids. 10

(*b*) Explain the synthesis of cholesterol and its regulation. 10

4. Write notes on :

(*a*) Synthesis of Adenine through salvage pathway. 10

(*b*) Biosynthesis of amino acids of pyruvate family. 10

5. (*a*) Describe the regulation of nitrogen metabolism, including hormonal control. 10

(*b*) Discuss the clinical significance of disorders related to nitrogen metabolism. 10

6. Write down the brief notes on the following : 20

(*a*) Bioenergetics and their types

(*b*) Chemolithotrophs

(*c*) Degradation of pyrimidines

(*d*) Ammonia Assimilation.

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

NEPSST—484—2025

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2025

MICROBIOLOGY

SMICE-401

(Commercial Microbiology)

(Saturday, 26-4-2025) **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 attempt any *three* questions.

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

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

(*a*) Microbial treatment of Petroleum waste.

(*b*) Application of microbial nano-technology in industry.

(*c*) Microbial Solar Cell.

(*d*) Antimicrobial textile.

P.T.O.

2. (*a*) Explain in detail microbial techniques for hydrocarbon exploration. 8

(*b*) Write on microbial process for Petroleum recovery. 7

3. (*a*) Give an account on microbial mediated synthesis of metallic nano-particles (MPs) 8

(*b*) Explain in detail role of intracellular and extracellular enzymes in biosynthesis of nano-particles. 7

4. (*a*) Explain in detail microbial fuel cells. 8

(*b*) Define Electromicrobiology. Write on grand challenges and goals in electromicrobiology. 7

5. (*a*) Write on generation of value added product from agro-industry waste by microbial valorization. 8

(*b*) Take a detailed account on production, degradation and application of PHB. 7

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

(*a*) Microbial enhanced oil recovery

(*b*) Nano-bacteria and Nano-structures

(*c*) Electroactive microorganisms

(*d*) Role of microbial product in cosmetic industry.

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

NEPSST—41—2025

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2025

(NEP-2020)

MICROBIOLOGY

SMICC-1451

(Microbial Methods for Environment Management)

(Thursday, 17-4-2025) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three 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 required.

1. Write brief notes on the following : 20

   (*a*) Biodeterioration

   (*b*) Bioleaching

   (*c*) Trickeling filter

   (*d*) Formation of ozone.

2. (*a*) Describe in detail biodeterioration of wood. 10

   (*b*) Explain the biomagnification of pesticides. 10

P.T.O.

3. (*a*) Write in detail biotransformation of mercury. 10

(*b*) Describe in detail microbes involved in plastic degradation. 10

4. (*a*) Discuss the process of phytoremediation. 10

(*b*) Write in detail tertiary treatment of waste water. 10

5. (*a*) Take a detailed account of causes of global warming. 10

(*b*) Explain the adverse effects of acid rain. 10

6. Write brief notes on the following : 20

(*a*) Eutrophication

(*b*) Metalloides

(*c*) Activated sludge

(*d*) Acid mine drainage.

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

NEPSST—130—2025

FACULTY OF SCIENCE

M.Sc. (Second Semester) EXAMINATION

APRIL/MAY, 2025

MICROBIOLOGY

Paper SMICC-1452

(Biostatistics and Bioinformatics)

(Monday, 21-4-2025) **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 diagrams wherever necessory.

1. Write brief notes on the following : 20

   (*a*) Histogram

   (*b*) Types of errors

   (*c*) HTTP

   (*d*) Swiss Prot.

2. (*a*) Describe in detail about the sampling methods. 10

   (*b*) From the following find out the mean : 10

Marks (X)	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of Students (F)	10	18	20	26	30	28	18

P.T.O.

3.	(*a*)	Explain hypothesis testing in detail.	10
	(*b*)	Describe ANOVA in detail.	10
4.	(*a*)	Give a brief note on biological databases.	10
	(*b*)	Describe information networks in detail.	10
5.	(*a*)	Describe multiple sequence alignment in detail.	10
	(*b*)	Describe sequence queries analysis by BLAST	10
6.		Write brief notes on the following :	20
	(*a*)	Skewness	
	(*b*)	CRD	
	(*c*)	EMB-Net	
	(*d*)	PDB.	

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

NEPSST—227—2025

FACULTY OF SCIENCE AND TECHNOLOGY

M.Sc. (Second Semester) EXAMINATION

APRIL/MAY, 2025

MICROBIOLOGY

Paper–SMICC-1453

(Food Microbiology and Food Safety)

(Wednesday, 23-4-2025) **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*) Spoilage of meat

   (*b*) PFA

   (*c*) Naturally occurring antimicrobials

   (*d*) Probiotic foods.

2. (*a*) Define food spoilage. Explain in detail general factors affecting food spoilage. 10

   (*b*) Take a detailed account on spoilage of vegetables and fruits. 10

P.T.O.

3. (*a*) Describe in brief microbiological quality and standards of food. 10

(*b*) Define food intoxication. Explain in detail *clostridium intoxication*. 10

4. (*a*) Describe in detail thermal processing. 10

(*b*) Take a detailed account on drying techniques. 10

5. (*a*) Describe in detail fermented meat. 10

(*b*) Discuss in brief GM foods. 10

6. Write brief notes on the following : 20

(*a*) Spoilage of poultry product

(*b*) Health status of food handlers

(*c*) Biosensors in food industry

(*d*) Curd and shrikhand.

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

NEPSST—407—2025

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2025

MICROBIOLOGY

Paper–SMICE-1451

(Bioprocess Technology)

(Friday, 25-4-2025) **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 labelled diagram wherever required.

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

(*a*) Continuous stirred tank reactor

(*b*) Scale-up of fermentation process

(*c*) Biopolymer and its application

(*d*) Application of Glucose oxidase.

P.T.O.

2. (*a*) What is bioreactor ? Explain design and working of batch reactor. 8

(*b*) Explain Monod model of growth kinetics. 7

3. (*a*) Explain steps involved in primary separation of fermented liquor. 8

(*b*) Write on chromatographic methods used for purification of product. 7

4. (*a*) Describe microbiology and biochemistry of streptomycin product. 8

(*b*) Write a note on biotransformation of steroids. 7

5. (*a*) Explain fermentative production of amylase using solid state fermentation. 8

(*b*) Write an production of Lactic acid from whey. 7

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

(*a*) Application of citric acid

(*b*) Counter-current solvent extraction

(*c*) Immobilized reactors

(*d*) Biogas and its application.

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

NEPSST—16—2025

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2025

MICROBIOLOGY

Paper SMICC-1501

(Environmental and Agricultural Microbiology)

(Wednesday, 16-4-2025) **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three 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 (any *four*) : 20

   (*a*) Biotic environment

   (*b*) Thermophiles

   (*c*) Sulfur cycle

   (*d*) Biopesticides

   (*e*) Oil pollution

   (*f*) Xenobiotic compounds.

2. (*a*) Define ecosystem. Write a note on environmental segments. 10

   (*b*) Explain in detail eutrophication process. 10

P.T.O.

3. (*a*) Explain occurrence, diversity and adaptations of halophiles in their ecosystem. 10

(*b*) Write a note on assessment and ethical issues of Genetically modified organisms in environment. 10

4. (*a*) Explain oxidation and reduction process of iron carried out by microorganisms. 10

(*b*) Write a note on beneficial and pathogenic roles of microbes in agriculture. 10

5. (*a*) Define Compost. Explain types of compost. 10

(*b*) Explain in detail genetically modified foods. 10

6. Write brief notes on the following (any *four*) : 20

(*a*) Biomagnification

(*b*) Global warming

(*c*) Nitrogen cycle

(*d*) Biofertilizer

(*e*) Climate change

(*f*) Oligotrophs.

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

NEPSST—83—2025

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2025

MICROBIOLOGY

Paper–SMICC-1502

(Molecular Immunology and Human Microbiomes)

(Saturday, 19-4-2025) **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 diagrams wherever necessary.

1. Write brief notes on the following : 20

   (*a*) B-lymphocytes

   (*b*) Immunogens

   (*c*) Mast cell

   (*d*) Microbiot of oral cavity.

2. (*a*) Explain in detail maturation, activation and differentiation of B-lymphocytes. 10

   (*b*) What are lymphoid organs ? Explain in detail secondary lymphoid organs. 10

P.T.O.

3. (*a*) What are immunoglubulins ? Discuss classes and their functions. 10

(*b*) What is the genetic model of Ig structure ? 10

4. (*a*) Describe the structure, gene organization and function of MHC class I. 10

(*b*) Explain Autoimmune diseases. 10

5. (*a*) Explain the Microbiota of respiratory system. 10

(*b*) Explain in detail gut Brain axis. 10

6. Write brief notes on the following : 20

(*a*) Dendritic cells

(*b*) Gut brain axis

(*c*) Hypersensitivity

(*d*) Isotypic Antibodies.

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

NEPSST—179—2025

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2025

MICROBIOLOGY

Paper SMICC 1503

(Molecular Biology and *r*DNA Technology)

(Tuesday, 22-4-2025) **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*) Of the remaining attempt any *three* questions.

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

1. Write in brief on the following : 20

   (*a*) Klenow fragments

   (*b*) Site specific mutagenesis

   (*c*) Gene transfer by pronuclear microinjection

   (*d*) Stem cell therapy.

2. (*a*) Define gene probes. Explain development and labelling of DNA and RNA probes. 10

   (*b*) Discuss role of cosmids, phasmids and phagemids as vectors. 10

P.T.O.

3. (*a*) Compare and contrast between Southern and Northern blotting. 10

(*b*) Discuss different types of PCR techniques. 10

4. (*a*) Take a detailed account of cloning and expressions in *Saccharomyces*. 10

(*b*) Explain jumping and hopping libraries. 10

5. (*a*) Write on process of engineering microorganisms for the production of antibiotics. 10

(*b*) Explain the ethical, legal and environmental issues associated with *r*DNA Technology. 10

6. Write in brief on : 20

(*a*) Retroviral vectors

(*b*) PCR in molecular diagnostics

(*c*) Ti-plasmids

(*d*) Gene silencing in bacteria.

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

NEPSST—301—2025

FACULTY OF SCIENCE

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

APRIL/MAY, 2025

MICROBIOLOGY

SMICE-1501

(Pharmaceutical Microbiology)

(Thursday, 24-4-2025) **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three 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 diagrams wherever necessary.

1. Write brief notes on the following : 20

   (*a*) QC

   (*b*) D-value

   (*c*) DNA-vaccine

   (*d*) Peptide antibiotics.

2. (*a*) Describe in detail role of quality assurance in Pharmaceutical Industry. 10

   (*b*) Write in brief principles regarding the designing of microbiology laboratory. 10

P.T.O.

3. (*a*) Write down the design and functions of different bioreactors in pharmaceutical lab. 10

(*b*) Describe advances and use of different cell lines in biopharmaceutical products. 10

4. (*a*) Discuss in detail about FDA perspective and legislative perspective. 10

(*b*) Describe in detail production of sterile and non-sterile injectables. 10

5. (*a*) Explain in detail mechanism of action of antibiotics inhibiting protein synthesis. 10

(*b*) Discuss in detail importance of microbiology in pharmaceutical industry. 10

6. Write brief notes on the following : 20

(*a*) WHO

(*b*) CHO

(*c*) Rational drug design

(*d*) Monoclonal Antibodies.

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

NEPSST—43—2025

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2025

(NEP 2020)

RESEARCH AND PUBLICATION ETHICS

NEPPE-1002

(Thursday, 17-4-2025) **Time : 2.00 p.m. to 4.00 p.m.**

Time—2 *Hours* *Maximum Marks*—40

N.B. *:—* (*i*) Question Number **1** is compulsory.

(*ii*) Solve any *three* questions of the remaining.

1. Write notes on : 5×2=10

(*a*) Nature of philosophy

(*b*) Research integrity

(*c*) Importance of publication ethics

(*d*) Characteristics to call a journal open

(*e*) *h*-index.

P.T.O.

2. (*a*) Define philosophy. Explain its branches. 5×2=10

(*b*) What do you mean by fabrication, falsification and plagiarism (FFP).

3. (*a*) Define publication ethics. Write the importance of publication ethics. 5×2=10

(*b*) Describe SHERPA/ROMEO online resource and list three variant of text.

4. (*a*) What is predatory journal ? List the common characteristics of it. 5×2=10

(*b*) What is impact factor ? How does it calculate ? Explain it with a suitable example.

5. (*a*) What is plagiarism ? Give their types. 2×5=10

(*b*) Describe in detail SNIP and SJR.

6. Write short notes on : 4×2.5=10

(*a*) Moral philosophy

(*b*) Duplicate publication

(*c*) Principle of transparency

(*d*) Turnitin.

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

NEPSST—131—2025

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2025

(NEP)

MICROBIOLOGY

Paper SMICC-1551

(Advanced Enzyme Technology)

(Monday, 21-4-2025) **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 required.

1. Write brief notes on the following : 20

(*a*) Intracellular enzymes

(*b*) MWC Model

(*c*) Metalloenzymes

(*d*) Extremozymes.

P.T.O.

2. (*a*) Write a detailed explanation of the principles of affinity chromatography. 10

(*b*) Describe in detail the difference between Extracellular and Intracellular enzymes. 10

3. (*a*) Derive Michaelis-Menten equation assuming steady state kinetics. 10

(*b*) Write a detailed explanation of the concept of allosteric regulation and their significance. 10

4. (*a*) Discuss the advantages and limitations of using enzymes as biocatalysts in industrial applications. 10

(*b*) Explain the concept of enzyme substrate binding and the role of active sites in enzyme catalysis. 10

5. (*a*) Discuss the factors that affect the immobilisation of enzymes, including enzyme properties, support materials and immobilised methods. 10

(*b*) Explain the concept of enzyme-based biosensors and their applications in environmental monitoring and healthcare. 10

6. Write brief notes on the following : 20

(*a*) Enzyme crystallization techniques

(*b*) KNF model

(*c*) Vitamins

(*d*) Microbial enzymes in leather industries.

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

NEPSST—228—2025

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2025

MICROBIOLOGY

(Advances in Virology)

(Wednesday, 23-4-2025) **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 required.

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

   (*a*) ICTV

   (*b*) Viral replication

   (*c*) TMV

   (*d*) Viral evolution.

2. (*a*) Write in detail properties of viruses. 10

   (*b*) Explain in detail methods of cultivation of viruses into embryonated eggs. 10

P.T.O.

3. (*a*) Discuss in detail transcriptional and post-transcriptional synthesis of RNA. 10

(*b*) Define translation. Write in detail translation of viral proteins. 10

4. (*a*) Take a detailed account on pathogenesis of plant virus. 10

(*b*) Describe in brief pathogenesis of Animal Viruses. 10

5. (*a*) Write a note on viral vaccines and their preparation. 10

(*b*) Explain in detail viral evolution and emergence of new viruses. 10

6. Write brief notes on the following : 20

(*a*) Baltimore classification

(*b*) *m*RNA

(*c*) Corona viruses

(*d*) New vaccine technology.

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

NEPSST—408—2025

FACULTY OF SCIENCE AND TECHNOLOGY

M.Sc. (Fourth Semester) EXAMINATION

APRIL/MAY, 2025

MICROBIOLOGY

SMICE-1551

(Medical Laboratory Technology)

(Friday, 25-4-2025) **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*) Of the remaining attempt any *three* questions.

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

1. Write brief notes on the following : 20

   (*a*) Lactate dehydrogenase

   (*b*) Blood transfusion

   (*c*) Stock culture preservation

   (*d*) Serodiagnosis of streptococal infections.

2. (*a*) Explain therapeutic, diagnostic and amalytical uses of creatine kinase and phosphatases. 10

   (*b*) Elaborate in detail lipid profile test and its significance in various disorders. 10

P.T.O.

3. (*a*) Describe clinical laboratory safety and first aid in detail. 10

(*b*) Give a detailed account on blood banking in detail. 10

4. (*a*) Explain in detail different methods of sputum collection and their processing for laboratory analysis. 10

(*b*) Describe in detail laboratory diagnosis of leprosy. 10

5. (*a*) Describe in detail laboratory procedure in serology for c-reactive protein test and Rhumatoid orthritis test. 10

(*b*) Give an account on serodiagnosis of aids. 10

6. Write brief notes on the following : 20

(*a*) Determination of TSH

(*b*) Fibrinolysis

(*c*) Broth dilution

(*d*) Complement.