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

NEPRT—40—2024

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2024

BIOTECHNOLOGY

Paper (SBTCC-403)

(Biochemistry)

(Wednesday, 24-04-2024) **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 necessary.

1. Write brief notes on the following : 20

   (*a*) The pH scale

   (*b*) Collagen triple helix

   (*c*) General characteristics of enzyme

   (*d*) Primary structure of nucleic acids.

2. (*a*) Describe in detail concept of acids and bases. 10

   (*b*) Discuss ionization and properties of water. 10

3. (*a*) Discuss classification, occurrence and structure of polysaccharides. 10

   (*b*) Describe steroids and terpenes. 10

4. (*a*) Explain classification of amino acids on R group. 10

   (*b*) Discuss structural comparison at secondary and tertiary levels of proteins 10

P.T.O.

5. (*a*) Discuss in detail secondary and tertiary structure of DNA. 10

(*b*) Describe *t*-RNA and their biological significance. 10

6. Write brief notes on the following : 20

(*a*) Thermodynamic principles in biology

(*b*) Role of lipids

(*c*) *m*-RNA

(*d*) Secondary structure of protein.

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

NEPRT—04—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

BIOTECHNOLOGY

SBTTC–401

(Cell and Developmental Biology)

(Friday, 19-4-2024) **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 necessary.

1. Write brief notes on the following : 20

   (*a*) Golgi bodies

   (*b*) Signal transduction pathways

   (*c*) Apoptosis

   (*d*) Blastulation.

2. (*a*) Describe in detail various models of plasma membrane. 10

   (*b*) Explain in brief Na^+/K^+ pump. 10

P.T.O.

3. (*a*) Write a note on different cell adhesion molecules. 10

(*b*) Describe in detail signaling through G-protein coupled receptors. 10

4. (*a*) Write a note on Mitosis. 10

(*b*) Describe in detail Meiosis. 10

5. (*a*) Explain in detail Gametogenesis. 10

(*b*) Write in brief gastrulation and formation of germ layers in animals. 10

6. Write brief notes on the following : 20

(*a*) Microtubules

(*b*) Second messengers

(*c*) Cell cycle

(*d*) Fertilization.

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

NEPRT—23—2024

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2024

BOTANY

Paper SBOTC-402

(Diversity of Cryptogams)

(Monday, 22-04-2024) **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 necessary.

1. Write short notes on the following : 20

(*a*) Algal blooms

(*b*) Pleurilocular sporangia

(*c*) Economic importance of bryophytes

(*d*) Fossilization process.

P.T.O.

2. Describe in brief :

(*a*) Algal classification as per F.E. Fritsch (1944). 10

(*b*) Thallus organization in algae. 10

3. Write in brief :

(*a*) General morphology and sexual reproduction in charophyta. 10

(*b*) General morphology and vegetative reproduction in cyanophyta. 10

4. Describe in brief :

(*a*) Internal structure of Anthoceros thallus. 10

(*b*) Sexual reproduction in Marchantiales. 10

5. Describe in brief :

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

(*b*) Heterospory and seed habit. 10

6. Write brief notes on the following : 20

(*a*) SCP

(*b*) Thallus of oedogonium

(*c*) Funaria capsule

(*d*) Economic importance of Pteridophytes.

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

NEPRT—22—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

BIOTECHNOLOGY

Paper SBTTC-402

(Microbiology and Virology)

(Monday, 22-04-2024) **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 necessary.

1. Write brief notes on the following : 20

(*a*) Halophiles

(*b*) FAME

(*c*) Effect of oxygen on microbial growth

(*d*) Cultivation of viruses in animal cells.

P.T.O.

2.	(*a*)	Describe in detail pure culture methods.	10
	(*b*)	Explain mycobacterium and Rickettsias.	10
3.	(*a*)	Describe in detail microbial nutrition.	10
	(*b*)	Explain evolution of earth and earliest life forms.	10
4.	(*a*)	Describe in detail growth curve.	10
	(*b*)	Describe effect of pH and temperature on microbial growth.	10
5.	(*a*)	Describe in detail classification of viruses.	10
	(*b*)	Describe life cycle of lambda phage.	10
6.	Write brief notes on the following :		20
	(*a*)	Methanogens	
	(*b*)	Physical methods of sterilization	
	(*c*)	Continuous culture	
	(*d*)	Retrovirus.	

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

NEPRT—41—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

BOTANY

Paper (SBOTC-403)

(Taxonomy and Argiosperms and Gymnosperms)

(Wednesday, 24-04-2024) **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 necessary.

1. Write brief notes on the following : 20

   (*a*) Economic importances of gymnosperms.

   (*b*) Taxonomic structure.

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

   (*d*) Applications of molecular systematics.

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

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

3. (*a*) Describe in detail concept and types of plant speciation. 10

   (*b*) Describe in detail theories of origin of Angiosperms. 10

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

   (*b*) Give a detailed account of general characters of family annonaceae with its floral formula and floral diagram. 10

P.T.O.

5. (*a*) Describe in detail Numeral Taxonomy. 10

(*b*) Give a detailed account on Biosystematics. 10

6. Write brief notes on the following : 20

(*a*) Classification of gymnosperm proposed by Bhatnagar and Moitra (1996).

(*b*) Typological species concept.

(*c*) Diagnostic characters of family Orchidaceae.

(*d*) Chemotaxonomy.

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

RT—116—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(CBCS/New Pattern)

BIOTECHNOLOGY

Paper BT-VI

(Immunotechnology)

(Saturday, 20-4-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—75

N.B. :— (*i*) Attempt *All* questions.

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

(*iii*) Represent your answers with well labelled diagrams.

1. Define Antibody. Describe in detail different classes of immunoglobulins. 15

Or

Describe in detail cells of immune system.

2. Describe in detail mechanism of degranulation of mast cells. 15

Or

Define Complement. Describe in detail complement activation pathways.

P.T.O.

3. Define Autoimmunity ? Describe in detail systemic autoimmune diseases with its treatment. 15

Or

Define graft types. Describe mechanism of graft rejection.

4. Describe secondary immunodeficiency diseases with respect to HIV. 15

Or

Explain the following :

(*a*) Flow cytometry

(*b*) Vaccines.

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

(*a*) Antigens

(*b*) MHC

(*c*) Agglutination

(*d*) ELISA

(*e*) Spleen.

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

RT—37—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(CBCS/New Pattern)

BIOTECHNOLOGY

Paper BT-V

(Molecular Genetics)

(Thursday, 18-4-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—75

Note :— (*i*) *All* questions are compulsory.

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

(*iii*) Draw neat diagram wherever necessary.

1. Describe in detail gene transfer in prokaryotes. 15

Or

Write a note on complimentary genes and duplicate genes.

2. Explain is detail structure and types of chromosomes in eukaryotes. 15

Or

Write in brief variation in chromosome number.

P.T.O.

3. Describe in detail DNA replication in prokaryotes. 15

Or

Explain in brief DNA repair mechanism.

4. Write in brief post transcriptional RNA processing. 15

Or

Describe in detail Lac operon.

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

(*a*) Incomplete dominance

(*b*) Cot curve

(*c*) Transposition

(*d*) *t*-RNA

(*e*) Tryptophan operon.

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

RT—305—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(CBCS/New Pattern)

BIOTECHNOLOGY

Paper (BT-VIII)

(Nanobiotechnology)

(Monday, 29-04-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—75

N.B. :— (*i*) Attempt *all* questions.

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

(*iii*) Represent your answers with well labelled diagrams.

1. Describe in detail classification of nanoparticles based on carbon. 15

Or

Describe physical properties of nanoparticles.

2. Explain nanoparticles in cell interaction. 15

Or

Explain MEMS.

3. Describe in detail nanoparticles for drug delivery. 15

Or

Describe in detail antibacterial nanoparticles.

4. Describe in detail applications of nanobiotechnology in environment. 15

P.T.O.

Or

Define patent. Describe in detail steps involved in patent filing.

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

(*a*) Inorganic nanoparticle

(*b*) NEMS

(*c*) Lipid nanoparticle.

(*d*) Trademarks

(*e*) Copyrights.

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

RT—202—2024

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2024

(CBCS/New Pattern)

BIOTECHNOLOGY

BT-VII

(Process Biotechnology)

(Tuesday, 23-04-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—75

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Each question carries equal marks.

(*iii*) Draw labelled diagrams wherever necessary.

1. (*a*) Write down different preservation and maintenance methods of microorganism. 15

Or

(*b*) Explain genetic engineering for stain improvement.

2. (*a*) Explain body construction of Bioreactor and its application. 15

Or

(*b*) Describe ideal characteristics of bioreactor and add a note on packed bedreactor.

3. (*b*) Explain use of computer in fermentation process. 15

Or

(*b*) Explain immobilization techniques for cell in fermentation process.

4. (*a*) Describe microbial growth kinetics for continuous culture. 15

Or

(*b*) What is fermentation ? Explain types of fermentation process.

P.T.O.

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

(*a*) Mutagenesis

(*b*) Airlift & ilter

(*c*) Reynolds' number

(*d*) Z value

(*e*) Solid state fermentation.

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

RT—01—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(New/CBCS Pattern)

BIOTECHNOLOGY

Paper–I

(Cell and Development Biology)

(Tuesday, 16-04-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

N.B. :— (*i*) *All* questions are compulsory.

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

(*iii*) Draw neat diagram wherever necessary.

1. Describe in detail structure and functions of Mitochondria. 15

Or

Write a note on chloroplast.

2. Explain in detail cell adhesion molecules. 15

Or

Describe in brief gap junction.

P.T.O.

3. Explain in brief meiosis. 15

Or

Describe in detail mitosis.

4. Describe in detail Gametogenesis. 15

Or

Write in brief fertilization.

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

(*a*) Lysosomes

(*b*) Integrins

(*c*) Cell cycle regulation

(*d*) Blastulation

(*e*) Stem cells.

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

RT—76—2024

FACULTY OF SCIENCE

M.Sc. (First Semester) EXAMINATION

APRIL/MAY, 2024

(CBCS/New Pattern)

BIOTECHNOLOGY

Paper BT-II

(Microbiology and Virology)

(Friday, 19-04-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—75

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

(*ii*) Draw well labelled diagrams if necessary.

1. Describe in detail methods used for pure culture development. 15

Or

(*a*) Explain archaea as earliest life forms. 8

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

2. Define bacterial taxonomy. Explain classification of bacterial taxonomy. 15

P.T.O.

Or

(*a*) Explain methods of sterilization. 8

(*b*) Explain principle of microbial nutrition. 7

3. Describe in detail effect of environment pattern on microbial growth. 15

Or

(*a*) Discuss discovery of viruses. 8

(*b*) Explain structure of morphology of virus. 7

4. Describe in detail methods used for cultivation of viruses. 15

Or

(*a*) Describe life cycle of lambda phage. 8

(*b*) Discuss nomenclature of viruses. 7

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

(*a*) Taxonomy and nomenclature of microbes

(*b*) Ribotyping

(*c*) Life cycle of M13 phage

(*d*) Growth curve of microbes

(*e*) Retroviruses.

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

RT—244—2024

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2024

BIOTECHNOLOGY

Paper-BT-IV

(Plant Metabolism and Development)

(Wednesday, 24-04-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—75

N.B. :— (*i*) Attempt *All* questions.

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

(*iii*) Illustrate your answers with well labelled diagrams, scheme etc.

1. Describe the mechanism of active absorption.

Or

Describe the theories of absorption of minerals salts and ions.

2. Describe in detail dark reactions in photosynthesis.

Or

Give a detailed account of Glycolysis.

3. Describe in detail Auxin as Growth Hormone in plants.

Or

Describe in detail Gibberellins as Plant Growth regulator.

4. Describe in detail structure and functions of carpel.

Or

Describe in detail Pollen Development.

P.T.O.

5. Write short notes on (any *three*) :

(*a*) Osmosis

(*b*) CAM pathway

(*c*) Guard Cell Osmoregulation

(*d*) Androecium

(*e*) Abscisic Acid.

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

RT—243—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

BIOTECHNOLOGY

Paper-BT-4

(Techniques in Biotechnology)

(Wednesday, 24-04-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—75

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Draw a well labelled diagrams wherever necessary.

1. What is Microscope ? Describe phase contrast microscope. 15

Or

Write a note on ion-sensitive and gas sensitive electrodes.

2. What is chromatography ? Write a detailed note on HPLC. 15

Or

Describe 2-D gel electrophoresis with advantages and disadvantages.

3. Write a detailed note on UV-visible spectroscopy with application. 15

Or

Describe NMR with application.

4. Write principle of Liquid Scintillation counter with example. 15

Or

Write a detailed note on Biosensor.

P.T.O.

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

(*a*) Flowcytometry

(*b*) Nephelometry

(*c*) Light microscope

(*d*) Paper chromatography

(*e*) ELISA.

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

RT—304—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(CBCS/New Pattern)

BIOTECHNOLOGY

Paper (BT-VIII) (A)

(Enzymology)

(Monday, 29-04-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—75

N.B. :— (*i*) *All* questions are compulsory.

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

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

1. Explain effect of temperature, pH and substrate concentration on reaction rate. 15

Or

Describe IUB classification of enzymes.

2. Describe in detail Michaelis-Menten equation. 15

Or

Explain allosteric reactions and regulations.

3. Describe in detail competitive and non-competitive and their mode of action. 15

Or

Explain enzyme activity, turnover number and end point kinetic assay.

P.T.O.

4. Describe in detail covalent binding, microencapsulation and gel entrapment methods of immobilization. 15

Or

Explain mechanism of action and regulation of PDH complex.

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

(*a*) Activation energy

(*b*) Hill and scatchard plots.

(*c*) Uncompetitive inhibition

(*d*) Functions of enzymes.

(*e*) Lactate dehydrogenase.

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

RT—116—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(CBCS/New Pattern)

BIOTECHNOLOGY

Paper BT-VI

(Immunotechnology)

(Saturday, 20-4-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—75

N.B. :— (*i*) Attempt *All* questions.

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

(*iii*) Represent your answers with well labelled diagrams.

1. Define Antibody. Describe in detail different classes of immunoglobulins. 15

Or

Describe in detail cells of immune system.

2. Describe in detail mechanism of degranulation of mast cells. 15

Or

Define Complement. Describe in detail complement activation pathways.

P.T.O.

3. Define Autoimmunity ? Describe in detail systemic autoimmune diseases with its treatment. 15

Or

Define graft types. Describe mechanism of graft rejection.

4. Describe secondary immunodeficiency diseases with respect to HIV. 15

Or

Explain the following :

(*a*) Flow cytometry

(*b*) Vaccines.

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

(*a*) Antigens

(*b*) MHC

(*c*) Agglutination

(*d*) ELISA

(*e*) Spleen.

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

RT—37—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(CBCS/New Pattern)

BIOTECHNOLOGY

Paper BT-V

(Molecular Genetics)

(Thursday, 18-4-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—75

Note :— (*i*) *All* questions are compulsory.

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

(*iii*) Draw neat diagram wherever necessary.

1. Describe in detail gene transfer in prokaryotes. 15

Or

Write a note on complimentary genes and duplicate genes.

2. Explain is detail structure and types of chromosomes in eukaryotes. 15

Or

Write in brief variation in chromosome number.

P.T.O.

3. Describe in detail DNA replication in prokaryotes. 15

Or

Explain in brief DNA repair mechanism.

4. Write in brief post transcriptional RNA processing. 15

Or

Describe in detail Lac operon.

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

(*a*) Incomplete dominance

(*b*) Cot curve

(*c*) Transposition

(*d*) *t*-RNA

(*e*) Tryptophan operon.

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

RT—305—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(CBCS/New Pattern)

BIOTECHNOLOGY

Paper (BT-VIII)

(Nanobiotechnology)

(Monday, 29-04-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—75

N.B. :— (*i*) Attempt *all* questions.

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

(*iii*) Represent your answers with well labelled diagrams.

1. Describe in detail classification of nanoparticles based on carbon. 15

Or

Describe physical properties of nanoparticles.

2. Explain nanoparticles in cell interaction. 15

Or

Explain MEMS.

3. Describe in detail nanoparticles for drug delivery. 15

Or

Describe in detail antibacterial nanoparticles.

4. Describe in detail applications of nanobiotechnology in environment. 15

P.T.O.

Or

Define patent. Describe in detail steps involved in patent filing.

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

(*a*) Inorganic nanoparticle

(*b*) NEMS

(*c*) Lipid nanoparticle.

(*d*) Trademarks

(*e*) Copyrights.

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

RT—202—2024

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2024

(CBCS/New Pattern)

BIOTECHNOLOGY

BT-VII

(Process Biotechnology)

(Tuesday, 23-04-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—Three Hours *Maximum Marks*—75

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Each question carries equal marks.

(*iii*) Draw labelled diagrams wherever necessary.

1. (*a*) Write down different preservation and maintenance methods of microorganism. 15

Or

(*b*) Explain genetic engineering for stain improvement.

2. (*a*) Explain body construction of Bioreactor and its application. 15

Or

(*b*) Describe ideal characteristics of bioreactor and add a note on packed bedreactor.

3. (*b*) Explain use of computer in fermentation process. 15

Or

(*b*) Explain immobilization techniques for cell in fermentation process.

4. (*a*) Describe microbial growth kinetics for continuous culture. 15

Or

(*b*) What is fermentation ? Explain types of fermentation process.

P.T.O.

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

(*a*) Mutagenesis

(*b*) Airlift & ilter

(*c*) Reynolds' number

(*d*) Z value

(*e*) Solid state fermentation.

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

RT—245—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(New/CBCS Pattern)

BIOTECHNOLOGY

Paper (BT-XII)

(English and Science Communication Skills)

(Wednesday, 24-04-2024) **Time : 2.00 p.m. to 4.00 p.m.**

Time—Two Hours *Maximum Marks*—40

N.B. :— (*i*) *All* main questions are compulsory.

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

1. Differentiate between Formal and Informal Communication. 8

Or

(*a*) Importance of Communication Corporate World. 4

(*b*) Differentiate between Formal and Informal Communication. 4

2. Discuss types and characteristics of verbal communication. 8

Or

(*a*) Does our 'Dress and Appearance' affect our communication ? 4

(*b*) Role of Gestures in Communication. 4

3. How does time management contribute to overall productivity and success ? 8

Or

(*a*) Stages of negotiation. 4

(*b*) How to cultivate stress in productive energy ? 4

4. What are Formal and Informal Reports ? Discuss steps involved in writing formal reports. 8

P.T.O.

Or

(*a*) What information needs to be conveyed in the notice and agenda ? 4

(*b*) Draft a memo addressing clerk's consistent lateness issue in the work-place, emphasizing the importance of punctuality. 4

5. Write short notes on (any *two*) : 8

(*a*) Vertical Communication

(*b*) Chronemics in communication

(*c*) Interpersonal skills

(*d*) Characteristics of e-mail.

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

RT—02—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(New/CBCS Pattern)

BIOTECHNOLOGY

Paper–IX

(Genetic Engineering)

(Tuesday, 16-04-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

N.B. :— (*i*) Attempt *all* questions.

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

(*iii*) Represent your answers with well labelled diagrams.

1. Define vectors. Describe in detail plasmid vectors and phage vectors in gene cloning. 15

Or

Describe in detail restriction enzymes in gene cloning.

2. Describe in detail methods of cDNA library preparation. 15

Or

Explain DNA Fingerprinting and DNA Footprinting.

P.T.O.

3. Describe methods of protein engineering and its applications. 15

Or

Describe in detail methods of DNA sequencing.

4. Explain production of human growth hormone and vaccine. 15

Or

Describe microinjection and electroporation method of gene transfer.

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

(*a*) YAC

(*b*) Cosmids

(*c*) Southern blotting

(*d*) PCR

(*e*) Gene thearpy.

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

RT—77—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(CBCS/New Pattern)

BIOTECHNOLOGY

Paper BT-X

(Industrial Biotechnology)

(Friday, 19-04-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three Hours *Maximum Marks*—75

Note :— (*i*) *All* questions are compulsory.

(*ii*) Figures to the right indicate full marks.

1. Discuss in detail chemical methods of cell disruption. 15

Or

(*a*) Discuss in detail membrane processes with an example. 8

(*b*) Describe in detail principle and working of GC-MS. 7

P.T.O.

2. Describe in detail production and recovery of citric acid. 15

Or

(*a*) Explain in detail chemistry and properties of polyhydroxyalkanoates. 8

(*b*) Discuss production, recovery and applications of L-Tryptophan. 7

3. Discuss in detail production and applications of enzyme with example. 15

Or

(*a*) Discuss microbial transformation with example. 8

(*b*) Explain concept of microbial recovery of petroleum. 7

4. Discuss in detail transformation of non-steroid compounds. 15

Or

(*a*) Describe in detail operating cost estimates. 8

(*b*) Discuss concept of QC and QA. 7

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

(*a*) Glycerol

(*b*) Drying and crystallization

(*c*) Silica Gel

(*d*) Hydrolytic reactions

(*e*) Alginate.

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

RT—380—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

BIOTECHNOLOGY

(BT-XIII)

(Intellectual Property Right)

(Tueday, 30-04-2024) **Time : 2.00 p.m. to 4.30 p.m.**

Time—2½ Hours *Maximum Marks*—50

N.B. :— (*i*) Attempt *All* questions.

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

1. Define Research. Discuss in detail importance and steps in research. 10

Or

Describe types of sampling and steps in sampling.

2. Discuss in detail preparation of manuscript. 10

Or

Discuss presentation of scientific paper.

3. Discuss in detail criteria and procedure of patenting. 10

Or

Explain patent infringement its meaning, scope, litigation and examples.

4. Discuss plant variety protection in India . 10

Or

Discuss technology transfer its types and Indian scenario.

P.T.O.

5. Write short notes on (any *two*) : 2×5=10

(*i*) Characteristics of research

(*ii*) Role of Hypothesis

(*iii*) Copyright

(*iv*) Farmer's right

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

RT—306—2024

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2024

BIOTECHNOLOGY

Paper (BT-XVII)

(Animal Biotechnology)

(Monday, 29-04-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three Hours *Maximum Marks*—75

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Draw neat labelled diagram if necessary.

1. Describe in detail Laminar air flow along with its type. 15

Or

Describe in detail equipments and materials for animal cell culture.

2. Describe in detail nutritional requirements of cells. 15

Or

Define primary cell culture. Explain isolation and separation of cell from tissue.

3. Describe in detail cell synchronization of animal cell culture. 15

Or

Explain cell-cell interaction with an example.

4. Describe in detail hubridoma technology and its application. 15

P.T.O.

Or

Define transgene. Explain transgenic animal as model for human diseases.

5. Write short notes on any *three* of the following : 15

(*a*) Transgenics in industry

(*b*) Gene therapy

(*c*) Cytotoxicity assays

(*d*) Natural media for animal cell culture

(*e*) Serum dependent media for animal cell culture.

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

RT—38—2024

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2024

(New/CBCS)

BIOTECHNOLOGY

Paper XIV

(Computational Biology)

(Thursday, 18-4-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three Hours *Maximum Marks*—75

Note :— (*i*) Attempt *all* questions.

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

(*iii*) Illustrate your answers with suitable diagram scheme etc.

1. Give a detailed historical account of bioinformatics.

Or

Describe in detail structural databases.

2. Describe a detailed classification of proteins.

Or

Describe prediction of protein structure using computational methods.

P.T.O.

3. Describe identification and characterization of novel proteins.

Or

Describe databases and search engines in proteomics.

4. Describe functional genomics and toxicogenomics in detail.

Or

Describe sequencing strategies for whole genome analysis.

5. Write short notes on (any *three*) :

(*a*) Graphical representation of data

(*b*) Mode

(*c*) Mean deviation

(*d*) Variance

(*e*) Mean.

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

RT—203—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

BIOTECHNOLOGY

BT-XVI

(Environmental Biotechnology)

(Tuesday, 23-04-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three Hours *Maximum Marks*—75

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Draw a well labelled diagrams wherever necessary.

1. Describe global environmental problems. 15

Or

Describe nitrogen cycle and microorganisms involved in it.

2. Describe production of bioplastics and production of biosurfactants. 15

Or

What is Biofuels ? Describe biogas with its advantages and disadvantages.

3. What is pollution ? Describe air pollution and its control through Biotechnology. 15

Or

Write a note on mineral cycles.

4. Explain physical, chemical and biological treatment processes for waste water. 15

Or

Describe treatment schemes for waste water of dairy and distillary.

P.T.O.

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

(*a*) Vermi culture

(*b*) Bioremediation of contaminated soil.

(*c*) Food Chain and food web

(*d*) Bioemulsifiers

(*e*) Oxidation ponds.

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

RT—307—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

BIOTECHNOLOGY

Paper-XVII-B

(Food Biotechnology)

(Monday, 29-04-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three Hours *Maximum Marks*—75

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Draw a well labelled diagrams wherever necessary.

1. Describe HACCP system in detail. 15

Or

Write a note on microbial polysaccharides.

2. What is sweetners ? Describe types of sweetners and its applications and advantages. 15

Or

What is natural colour ? Write its types and application & advantages over artificial sweetners.

3. Write a note on genetic mechanisms involved in regulation of mycotoxin biosynthesis. 15

Or

Write a note on SCP, Spirulina and Chlorella as food source.

4. Write a note on Biotechnological approaches to improve nutritional quality and self life of fruits and vegetables. 15

P.T.O.

Or

Write a note on food quality and analysis.

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

(*a*) Food additives

(*b*) Causes of food spoilage

(*c*) Functional foods

(*d*) Production of Baker's yeast

(*e*) Food laws.

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

RT—117—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

BIOTECHNOLOGY

BT-XV

(Pharmaceutical Biotechnology)

(Saturday, 20-4-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three Hours *Maximum Marks*—75

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Attempt *all* questions.

1. What are antimicrobial drugs ? Explain mechanism of action of various antibacterial drugs. 15

Or

What are secondary metabolites ? Explain various plant secondary metabolites with suitable example. 15

2. Describe in detail structure and mechanisms of action of Amantadine and Azidothymidine. 15

Or

Explain in detail mechanism of action of drugs acting on central nervous system. 15

P.T.O.

3. Explain in detail site directed mutagenesis and gene shuffling and add angle on directed evolution. 15

Or

Describe in detail Edman's degradation method of protein sequencing and add a note on its limitations. 15

4. Describe in detail various steps involved in drug discovery. 15

Or

Explain the concept of Quantitative Structure Activity Relationship (QSAR) and add a note on different parameters of QSAR. 15

5. Write short notes on any *three* of the following : 3×5=15

(*a*) Corona virus

(*b*) Anticancer drugs

(*c*) Phases of clinical trials

(*d*) Mass spectrometry

(*e*) International pharmacopoeia.