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

NEPRT—33—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

MICROBIOLOGY

(Advance Techniques in Microbiology)

(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 : 20

(*a*) Scattering of light

(*b*) SDS page

(*c*) Negative staining in electron microscopy

(*d*) Applications of AI.

P.T.O.

2. (*a*) Discuss the method for separation of macromolecules using gel permeation chromatography. 10

(*b*) Take an account on spectroscopic analysis of macromolecules using ORD. 10

3. (*a*) Take a detailed account of principle and working of agarose gel electrophoresis. 10

(*b*) Write on principle, working and applications of radioimmunoassay. 10

4. Write on the following :

(*a*) TEM 10

(*b*) Working and applications of confocal microscopy. 10

5. Write notes on :

(*a*) Mapping of transcriptional start site 10

(*b*) Clever culture technique. 10

6. Write short notes on : 20

(*a*) Isopycnic centrifugation

(*b*) Immunoelectrophoresis

(*c*) Fluorescent dyes

(*d*) Microbial image analysis.

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

NEPRT—85—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

MICROBIOLOGY

(Commercial Microbiology)

(Tuesday, 30-04-2024) **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*) Out of the remaining attempt any *three* questions.

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

1. Write brief notes on the following (any *three*) : 15
   - (*a*) Microbial treatment of petroleum waste.
   - (*b*) Nanostructures
   - (*c*) Electroactive microorganisms.
   - (*d*) Role of microbes in textile industry.

2. (*a*) Describe in detail origin of petroleum : 8
   - (*i*) Biogenesis
   - (*ii*) Abiogenesis.

   (*b*) Give a detailed account on microbial techniques for exploration of hydrocarbon. 7

3. (*a*) Give brief account on microbial mediated synthesis of metalic nanoparticles (MNPs). 8

   (*b*) Explain in detail role of intracellular and extracellular microbial enzymes in synthesis of nanoparticels. 7

4. (*a*) Define microbial fuel cells. Explain its construction and working. 8

   (*b*) Explain mechanism of extracellular electron transfer (EET). 7

P.T.O.

5. (*a*) Explain in detail microbial valorization of agro-industry waste for generation of value-added product. 8

(*b*) What is the antimicrobial textile ? Explain the role of microbes in textile industry. 7

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

(*a*) Microbial Enhanced Oil Recovery [MEO]

(*b*) Applications of microbial nanotechnology in industry.

(*c*) Microbial Solar Cells.

(*d*) Use of microbial products in cosmetic industry.

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

NEPRT—15—2024

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2024

MICROBIOLOGY

(Microbial Diversity and Evolution)

(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 diagrams wherever necessary.

1. Write brief notes on the following : 20

   (*a*) RNA world

   (*b*) Autotrophy in archaea

   (*c*) Sulphur oxidizing bacteria

   (*d*) Phylum Thermotoga.

2. (*a*) Write briefly on systematic evolution of earth and early life forms. 10

   (*b*) Take a detailed account of evolutionary chromometers and ribosomal RNA sequencing. 10

P.T.O.

3. (*a*) Describe in detail phylum Euryarchaeota. 10

(*b*) Take a detailed account of Phylum Nano-archaeota. 10

4. (*a*) Take a detailed account on bacterial Phylum Cyanobacteria. 10

(*b*) Describe in detail Phylum Verrucomicrobia. 10

5. (*a*) Write an bacterial phylum nitrospira and deferribacter. 10

(*b*) Explain in detail morphological and physiological characteristics of bacterial phylum Deinococci. 10

6. Write brief notes on the following : 20

(*a*) Eukarya

(*b*) Deinococci

(*c*) Deferribacter

(*d*) Free living nitrogen fixing bacteria.

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

NEPRT—51—2024

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2024

MICROBIOLOGY

Paper (SMICC-403)

(Microbial Physiology and Metabolism)

(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 required.

1. Write short notes on the following : 20

   (*a*) Glyoxylate pathway

   (*b*) Phycobilins

   (*c*) Purine nucleotides

   (*d*) 'nif' genes

2. (*a*) Take a detailed account of feeder pathway of glycolysis. 10

   (*b*) Describe in detail electron carriers in mitochondrion. 10

3. Write notes on :

   (*a*) β-oxidation of fatty acids. 10

   (*b*) Photophosphorylation in cyanobacteria. 10

4. (*a*) Write down the denovo synthesis of pyrimidine nucleotides. 10

   (*b*) Describe in detail L-histidine biosynthesis. 10

P.T.O.

5. (*a*) Discuss the mechanism of nitrogen assimilation. 10

(*b*) What is meant by nitrogen fixation ? Add a note on nitrogenase enzyme. 10

6. Write brief notes on the following : 20

(*a*) Heterolactate fermentation

(*b*) Chemolithotrophs

(*c*) Biosynthetic family of amino acid

(*d*) Denitrification.

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

NEPRT—157—2024

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2024

MICROBIOLOGY

Paper (SMICE-451)

(Bioprocess Technology)

(Monday, 29-04-2024) **Time : 10.00 a.m. to 12.30 p.m.**

Time—2½ *Hours* *Maximum Marks*—60

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

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

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

1. Write notes on any *three* : 15

(*a*) Aerator and agitator

(*b*) Fractional distillation

(*c*) Biopolymers

(*d*) Application of Glucose oxidase.

P.T.O.

2. (*a*) Take a detailed account on design and parts of batch fermenter along with its function. 8

(*b*) Write on growth yield and kinetics of product formation. 7

3. (*a*) Explain scale-up of fermentation process from lab to industrial level. 8

(*b*) Write on principle and application of affinity chromatography with example. 7

4. (*a*) What is biofuel ? Explain steps involved in ethanol production from cellulosic material. 8

(*b*) Explain microbiology and biochemistry of methane production. 7

5. (*a*) Explain in detail microbial production of citric acid. 8

(*b*) Write on amylase production using solid state fermentation. 7

6. Write notes on any *three* : 15

(*a*) Fluidized bed reactor

(*b*) Solvent extraction

(*c*) Xanthan

(*d*) Vitamin B_{12} biosynthesis.

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

NEPRT—136—2024

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2024

MICROBIOLOGY

(Food Microbiology and Food Safety)

(Tuesday, 23-04-2024) **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 required.

1. Write brief notes on the following : 20

   (*a*) Spoilage of milk products

   (*b*) Mycotoxins in food

   (*c*) Vacuum drying

   (*d*) Sauerkraut

2. (*a*) Write in detail spoilage of poultry products. 10

   (*b*) Explain in detail intrinsic and extrinsic factors affecting on food spoilage. 10

P.T.O.

3. (*a*) Discuss in detail sources of food pathogens and their pathological effects. 10

(*b*) Define food infection. Write in detail food infection caused by salmonella and shigella. 10

4. (*a*) Take a detailed account on principles and applications of biosensors in food industry. 10

(*b*) Describe in brief blanching and commercial sterilization techniques used in food preservation. 10

5. (*a*) Write a note on genetically modified foods. 10

(*b*) Explain in detail fermented fish and meat. 10

6. Write brief notes on the following : 20

(*a*) Vegetables and fruit spoilage

(*b*) HACCP

(*c*) Naturally occurring antimicrobials

(*d*) Probiotic foods.

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

NEPRT—94—2024

FACULTY OF SCIENCE & TECHNOLOGY

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

APRIL/MAY, 2024

MICROBIOLOGY

Paper SMICC1451

(Microbial Methods of Environment Management)

(Thursday, 18-04-2024) **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 well labelled diagrams wherever necessary.

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

(*a*) Biodeterioration

(*b*) Hexachlorobenzene

(*c*) Phytoremediation

(*d*) Greenhouse gases.

P.T.O.

2. (*a*) Take a brief account of biomagnification process. 10

(*b*) Discuss the different effects of eutrophication. 10

3. (*a*) Write down the process of bioleaching of metallic ores. 10

(*b*) Describe in detail biotransformation of mercury. 10

4. (*a*) Write down the anaerobic methods for waste water treatment. 10

(*b*) Explain the utilization of fluidized bed reactors in waste water treatment. 10

5. Write on the following : 20

(*a*) Causes of ozone depletion.

(*b*) Climatic change.

6. Write down brief notes on the following : 20

(*a*) Biodeterioration of wood

(*b*) Recalcitrant compounds

(*c*) COD

(*d*) Nitrous oxide.

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

RT—204—2024

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2024

MICROBIOLOGY

Paper-MB-203

(Bioprocess Engineering)

(Tuesday, 23-04-2024) **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*) Draw well labelled diagrams wherever necessary.

1. What is mixed culture ? Describe in detail industrial utilization of mixed culture and add a note on mixed culture in nature. 15

Or

Define continuous culture. Explain in detail construction, working and applications of chemostat and turbidostat.

2. Define bioreactor. Explain with well labelled diagram ideal design of bioreactor with construction and working of all the accessories attached with bioreactor. 15

Or

Write in detail probes used for online monitoring and control of fermentation process.

3. Explain Gas Liquid mass transfer in cellular system. Add a note on influence of aeration and agitation on gas liquid mass transfer. 15

Or

Write on different methods for determination of oxygen transfer rates. Add a note on determination of kLa.

P.T.O.

4. Explain in detail steps involved in formulation of production media and write on sterilization of media. 15

Or

What is down stream processing ? Write in detail recovery of fermentatively produced product at industrial level.

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

(*a*) Approach of bioprocess engineer.

(*b*) Trickle bed reactor.

(*c*) Basic mass transfer concept.

(*d*) Commercial enzymes.

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

RT—308—2024

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2024

(New/CBCS Pattern)

MICROBIOLOGY

Paper (MB-204)

(Enzyme Technology)

(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*) Each question carries equal marks.

(*iii*) Represent your answer with well labelled diagram wherever necessary.

1. What are different sources of enzymes ? Explain physical and chemical methods used for cell disintegration for isolation of intracellular enzyme. 15

Or

Explain purification of enzyme by using liquid-liquid extraction, ion exchange and gel electrophoresis.

2. What are inhibitors ? Give a detailed account of inhibitors and discuss kinetics of reversible inhibitors. 15

Or

What are allosteric enzymes ? Explain in detail allosteric regulation. Add a note on its role and significance in metabolic regulation.

P.T.O.

3. Define Active site. Explain the structure of active site. Add a note on role of ionizable group in catalysis. 15

Or

Explain in detail chemical modification and site directed mutagenesis with special reference to studying structure and function of enzymes.

4. Write an essay on "Role of microbial enzymes in wood and detergent industry. 15

Or

What are biosensors ? Give a detailed account of enzymes used in clinical diagnosis and enzyme sensors.

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

(*a*) Pitfalls in working with pure enzymes

(*b*) Uncompetitive inhibitors

(*c*) Enzyme activators

(*d*) Extremozymes.

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

RT—39—2024

FACULTY OF SCIENCE

M.Sc. (Second Semester) EXAMINATION

APRIL/MAY, 2024

(CBCS/New Pattern)

MICROBIOLOGY

Paper MB-201

(Microbial Metabolism)

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

Time—Three Hours *Maximum Marks*—75

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

(*ii*) Represent your answers with suitable diagram, if necessary.

1. Write in detail photophosphorylation. 15

Or

Write down the basic aspects of bioenergetics.

2. Describe the pathway generating reducing power for biosynthesis and precursors for nucleic acid synthesis. 15

P.T.O.

Or

What is amphibolic pathway ? Add a note on oxidation of acetyl CoA.

3. Discuss the process for biosynthesis of amino acid of phosphoglycerate family. 15

Or

Write down biosynthesis of purine nucleotides by de-novo pathways.

4. Describe the microbial degradation of aromatic hydrocarbons. 15

Or

Explain the growth of microorganism on C_1 compound.

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

(*a*) Chemoautotrophs

(*b*) Heterolactate fermentation

(*c*) Pyruvate family of amino acid

(*d*) PHB.

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

RT—118—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

MICROBIOLOGY

MB-202

(Modern Microbial Genetics)

(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*) Represent your answers with suitable diagrams if necessary.

1. What is a mutagenic agent ? Write on base analogs and nitrous oxide as mutagenic agent. 15

Or

Write on different enzymes and proteins involved in DNA replication along with their functions and role.

2. Discuss the structure of promotor. Add a note on structure and functions of RNA. 15

Or

What is genetic code ? Discuss in detail properties of Genetic code.

P.T.O.

3. Discuss in detail regulation in tryptophan operon. 15

Or

Take a detailed account of regulation in Arabinose Operon.

4. Explain in detail genetic mapping using cotransformation. 15

Or

What is Hfr ? Explain in detail formation of Hfr.

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

(*a*) Okazaki fragments

(*b*) Aminoacylation of *t*RNA

(*c*) λ repressor

(*d*) Insertion sequences.

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

RT—247—2024

FACULTY OF SCIENCE

M.Sc. (Third Semester) EXAMINATION

APRIL/MAY, 2024

(New/CBCS Pattern)

MICROBIOLOGY

Paper-XIV (MB-304)

(Biostatistics, Computer Applications and Research Methodology)

(Wednesday, 24-04-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three Hours *Maximum Marks*—75

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

(*ii*) Give neat diagrams and suitable examples wherever it is required.

(*iii*) Use of simple, non-programmable calculator is allowed.

1. Define data. Elaborate types of data and method of data collection. 15

Or

The below table gives a data on heights (in cm) of SI plants :

Height (in cm)	**No. of Plants**
140—150	6
150—160	16
160—170	21
170—180	8

Compute median and mode of given data.

P.T.O.

2. In an orchard of 100 trees, a record was taken for the no. of shaded and inshaded trees and in each of these classes. The frequency of high and low yielding trees were noted below : 15

	Shaded	**Unshaded**
Low yielding	35	20
High yielding	40	05

Calculate χ^2 and test your null hypothesis.

(5% value of χ^2 for one degree of freedom is 3.84)

Or

Define Probability. Illustrate and elaborate the types and rules of probability and add a note on probability distributions.

3. Write in detail about MS-Word with suitable diagram and describe function and limitation of MS-Word. 15

Or

Take a detailed account on organisation and classification of computers.

4. What is meant by "Research Methodology ?" Explain in detail steps involved in biological research. 15

Or

Illustrate and elaborate legal aspects of scientific authorship with reference to copyright and plagiarism.

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

(*i*) Graphical representation of data

(*ii*) ANOVA

(*iii*) Operating System

(*iv*) Harvard and Vancouver reference style.

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

RT—157—2024

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2024

(CBCS/New Pattern)

MICROBIOLOGY

Paper XIII (MB-303)

(Microbial Diversity and Extremophiles)

(Monday, 22-04-2024) **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*) Draw neat and well labelled diagrams wherever necessary.

1. Describe in detail phylogenetic tree of bacteria based on 16S *r*RNA sequencing. 15

Or

Describe in detail thermophiles. Explain commercial aspects of thermophiles.

2. Describe in detail Mutants, antiporters and alkaliphily of alkalophiles. 15

Or

Describe classification, acido-tolerance and applications of acidophiles.

P.T.O.

3. Take a detailed account of limits for life at subzero temperature for psychrophilic microorganisms. 15

Or

Explain in detail life at low temperature. Add a note on ice binding proteins.

4. Describe in detail applications of halophiles and their extremozymes. 15

Or

Classify barophiles. Discuss death under pressure.

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

(*a*) Microbial diversity

(*b*) Intracellular enzymes

(*c*) Cyanobacteria in cold ecosystem

(*d*) Microalgae in polar regions

(*e*) Compatible solutes.

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

RT—04—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(New/CBCS Pattern)

MICROBIOLOGY

Paper–XI (MB–301)

(Molecular Immunology)

(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*) Represent your answer with suitable diagrams if necessary.

1. Illustrate in detail structure and functions of lymph node. 15

Or

Write on structure and functions of granulocytes.

2. Discuss in detail properties of antigens. 15

Or

Discuss basic structure of immunoglobulin. Add a note on its functions.

3. Write on the mechanism of variable region gene arrangement. 15

P.T.O.

Or

Explain the mechanism of class switching in constant region genes.

4. Take a detailed account of structure and functions of MHC Class-I and Class-II. 15

Or

Discuss in detail mechanism of organ specific autoimmune diseases.

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

(*a*) Natural killer cells

(*b*) Superantigens

(*c*) Somatic hypermutation

(*d*) Contact dermatitis

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

RT—79—2024

FACULTY OF SCIENCE

M.Sc. (Third Semester) EXAMINATION

APRIL/MAY, 2024

(CBCS/New Pattern)

MICROBIOLOGY

Paper XII-MB-302

(Recombinant DNA Technology)

(Friday, 19-04-2024) **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 properly labelled figures and structures, wherever necessary.

1. Write in detail about different enzymes used in recombinant DNA technology along with their mode of action and examples. 15

Or

Explain in detail development and labelling of DNA and RNA probes.

P.T.O.

2. Explain in detail different DNA sequencing methods. 15

Or

Take a detailed account of blotting methods used for DNA and RNA hybridization.

3. Explain various techniques involved in physical and chemical methods of insertion of foreign DNA into the host cells. 15

Or

Explain in detail functional organization of Ti-plasmid.

4. Describe in detail various types and applications of molecular markers. 15

Or

Discuss the ethical, legal and environmental issues associated with *r*-DNA technology.

5. Write on any *three* : 15

(*i*) PUC 18 vector

(*ii*) Designing of primers for PCR

(*iii*) Plaque hybridization

(*iv*) Application of *r*-DNA technology in forensic sciences.

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

RT—205—2024

FACULTY OF SCIENCE

M.Sc. (Fourth Semester) EXAMINATION

APRIL/MAY, 2024

MICROBIOLOGY

Paper XVIII

(Environmental Microbiology)

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

Time—Three Hours *Maximum Marks*—75

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

(*ii*) Represent your answer wherever necessary.

1. Describe in detail structure and function of Ecosystem. 15

Or

Write in detail on Layers of atmosphere.

2. Describe in detail Aerobic treatment of municipal sewage. 15

Or

Take a detailed account of sources of water pollution, Add a note on BOD.

3. Describe in detail Microbial transformation of Mercury and Arsenic. 15

Or

Define GMO. Add a note on their applications.

4. What is 'Acid Mine" drainage ? Take a detailed account of its cause and effects. 15

Or

What is Eutrophication ? Explain in detail process of Eutrophication.

P.T.O.

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

(*a*) Food Web

(*b*) UASB

(*c*) Poly chlorinated biphenyls.

(*d*) UVB.

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

RT—40—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(New/CBCS)

MICROBIOLOGY

Paper XVI MB-401

(Fermentation Technology)

(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*) Represent your answer with suitable diagrams, schemes and examples wherever necessary.

1. Describe in detail production of undistilled alcoholic beverage with respect to beer. 15

Or

Explain in brief :

(*a*) Anaplerotic sequence in citric acid cycle. 8

(*b*) Application of alpha amylase. 7

P.T.O.

2. What are secondary metabolites ? Explain in detail production of penicillin. 15

Or

Write short notes on :

(*a*) Rifamycin production. 8

(*b*) Riboflavin fermentation. 7

3. Compare and contrast between hydrogen and methane production by microorganism. 15

Or

Explain in brief :

(*a*) Production and recovery of bioplastic. 8

(*b*) Fermentative production of thuricide. 7

4. Define immobilization. Explain in detail industrial technique used for immobilization of whole cell and enzymes. Comment on its advantages and its counterpart. 15

Or

Write notes on :

(*a*) Copyright 8

(*b*) Plant breeder's right and farmer's right. 7

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

(*a*) Wine production

(*b*) Strain development in *penicillium chrysogenum*.

(*c*) SCP

(*d*) Biomethanation

(*e*) Entrapment and microencapsulation of enzymes.

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

RT—119—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

MICROBIOLOGY

Paper-XVII (MB-402)

(Medical and Pharmaceutical Microbiology)

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

Time—Three Hours *Maximum Marks*—75

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

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

(*iii*) Illustrate your answer with proper figures and structure, wherever necessary.

1. Describe in detail mechanism of action of penicillin and streptomycin antibiotics. 15

Or

Write notes on :

(*a*) β-Lactum antibiotics 8

(*b*) Drug diffusion. 7

2. Describe in detail Microbial contamination and spoilage of ophthalmic preparation and implants. Add a note on their sterilization. 15

P.T.O.

Or

(*a*) DNA vaccines 8

(*b*) Vaccine clinical trials. 7

3. Explain in detail government regulatory practices and policies for pharmaceutical products. 15

Or

Write notes on :

(*a*) Application of biosensor in pharmaceuticals 8

(*b*) Application of microbial enzymes in pharmaceuticals. 7

4. Discuss design and layout of sterile product manufacturing unit. 15

Or

Write notes on :

(*a*) GMP 8

(*b*) D-value. 7

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

(*a*) Preservatives and antiseptics

(*b*) MIC value of drug

(*c*) Liposomes

(*d*) WHO certification

(*e*) Gaseous and filter sterilization.

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

RT—309—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

MICROBIOLOGY

Paper-XIX (MB-404)

(Microbial Bioinformatics, Genomics and Proteomics)

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

Time—Three Hours *Maximum Marks*—75

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

(*ii*) Represent your answers with suitable diagram if necessary.

1. Describe in detail account of Database Management System (DBMS). 15

Or

Give a detailed account of pairwise sequence alignment using dynamic programming.

2. Describe in detail the protein database with types. 15

Or

Give a detailed account of molecular visualizing tools.

3. Describe in detail methods of gene sequencing analysis. 15

Or

Give a detailed account of DNA analyses for repeats.

4. Give a detailed account of separation & isolation of proteins of proteomics. 15

P.T.O.

Or

Give a detailed account of protein struture predication.

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

(*a*) Biological database

(*b*) ATCC

(*c*) Significance of genome sequencing

(*d*) Classification of protein.