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

PB—12—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(New Course)

BIOTECHNOLOGY

(Basic of Bioscience)

(Saturday, 06-04-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

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

(*ii*) Draw a neat and well labelled diagram wherever necessary.

1. Explain Whittaker's fire kingdom system with merits and demerits. 15

Or

(*a*) Prokaryotic cell 8

(*b*) Eukaryotic cell. 7

2. Describe seed, seed development structure, germination and control of seed germination. 15

Or

(*a*) Write a note on T.S. monocot root. 8

(*b*) What is fruit ? Describe types of fruit. 7

3. Write a note on nuclear and embryo transplantation with example. 15

Or

Write on the following :

(*a*) Vermiculture 8

(*b*) Male reproductive system. 7

4. Explain effect of environment on growth and prevention of fungal growth in detail. 15

Or

Write on the following :

(*a*) Nutrition 8

(*b*) Reproduction. 7

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

(*i*) Ultra structure of typical fungal cell

(*ii*) Poultry farming

(*iii*) Gestation

(*iv*) Diversity of living world

(*v*) Flower.

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

PB—06—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(New Course)

BIOTECHNOLOGY

(Introduction to Biotechnology)

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

Time—3 *Hours* *Maximum Marks*—75

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

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

(*iii*) Draw neat diagram wherever necessary.

1. What are transgenic plants ? Describe in detail transgenic plants. 15

Or

(*a*) Describe in detail Biopesticides. 8

(*b*) Explain in brief plant tissue culture. 7

2. Describe in detail transgenic animal and their applications. 15

Or

(*a*) What is monoclonal antibodies ? Explain Monoclonal antibodies in detail. 8

(*b*) Explain in brief stem cells. 7

3. Define enzyme. Describe in detail classification of enzymes. 15

Or

(*a*) Ethanol production 8

(*b*) Cheese making 7

4. What is Biogas ? Describe in detail Biogas production. 15

Or

(*a*) Biodiesel 8

(*b*) Ethical and social impact of Biotechnology 7

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

(*a*) Rhizobium as a Biofertilizer

(*b*) Ag-Ab interactions

(*c*) Biodegradation

(*d*) Winery

(*e*) Solid waste management.

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

PB—18—2024

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2024

(New Pattern)

BIOTECHNOLOGY

(Microbiology–I)

(Wednesday, 10-04-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

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

(*ii*) Draw neat diagram wherever necessary.

1. Describe in detail controversy abiogenesis. 15

Or

(*a*) Explain the Koch's postulates. 8

(*b*) Write a short note on Physiological significance of fermentation. 7

2. Describe in detail soil and agricultural microbiology. 15

Or

(*a*) Write a short note on medical microbiology. 8

(*b*) Write a short note on dairy microbiology. 7

3. Describe in detail ultra-structure and bacteria. 15

Or

(*a*) Write a short note on cell membrane of bacteria. 8

(*b*) Write a short note on ribosome of bacteria. 7

4. Describe in detail germination and sporulation of endospore. 15

Or

(*a*) Write a short note on Eukaryotic cell structure. 8

(*b*) Write a short note on exospores of bacteria. 7

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

(*i*) Louis Pasteur

(*ii*) Space Microbiology

(*iii*) Magnetosome

(*iv*) Endoplasmic Reticulum

(*v*) PHB Granules.

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

PB—15—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(New Course)

BIOTECHNOLOGY

(Biomolecules)

(Monday, 08-04-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

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

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

(*iii*) Draw diagram wherever necessary.

1. Define carbohydrate. Describe in detail classification of carbohydrate. 15

Or

(*a*) Discuss chemical properties of monosaccharides. 8

(*b*) Explain structural aspects of monosaccharides. 7

2. Describe in detail nomenclature and classification of enzymes. 15

Or

(*a*) Explain physical and chemical properties of amino acid. 8

(*b*) Describe in detail tertiary and quaternary structures of proteins. 7

P.T.O.

3. Define nucleic acid. Discuss in detail types of RNA. 15

Or

(*a*) Explain nucleotides and nucleosides. 8

(*b*) Explain properties and biological role of nucleic acid. 7

4. Define lipid. Discuss classification of lipid with examples. 15

Or

(*a*) Explain water soluble vitamins with its structure, disorder and clinical significance. 8

(*b*) Discuss disorder and clinical significance of fat soluble vitamins. 7

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

(*i*) Glycogen

(*ii*) Peptides

(*iii*) Forms of DNA

(*iv*) α-helix

(*v*) Cholesterol.

This question paper contains **4** printed pages]

PB—04—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(New Course)

BIOTECHNOLOGY

(Business Communication–AECBT–2A)

(Wednesday, 03-04-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

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

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

1. What aspects do we consider while describing an object or a thing ? 15

Or

(*a*) Narrate your first visit to your Junior College. 7

(*b*) Describe your favourite Cricketer or Social Worker. 8

2. Solve any *three* sub-questions among the following : 15

(A) Rewrite sentences with correct form of the word : 5

(*i*) I don't want to lose/loose your keys.

(*ii*) Clothes that are lose/loose are comfortable but often not flattering.

(*iii*) We want an intelligent, capable and principaled/principled leader.

(*iv*) Please do not lie/lay on that sofa.

(*v*) Karen said that her chocolate desert/dessert was delicious.

P.T.O.

(B) Give meaning of the following Idioms and phrases : 5

(*i*) To hit the nail on the head

(*ii*) No pain no gain

(*iii*) The last straw

(*iv*) A couch potato

(*v*) Let the cat out of bag.

(C) Give antonyms of each word : 5

(*i*) Timid

(*ii*) Enlarge

(*iii*) Eccentric

(*iv*) Narrow

(*v*) Worsen

(D) Give one word substitution for the following : 5

(*i*) One who believes in fate

(*ii*) Life history of a person written by that person

(*iii*) A speech delivered without any previous preparation

(*iv*) One who studies the evolution of mankind

(*v*) A state of disorder due to absence of authority.

3. What are the basic approaches for understanding English ? 15

Or

(A) Choose the option that represents the most logical order : 8

(*i*) When they gathered together, the Buddha was completely silent and some speculated that perhaps the Buddha was tired or ill.

(*ii*) It is said that Gautam Buddha gathered his disciples one day for a Dharma talk.

(*iii*) One of the Buddha's disciples, Mahakashyapa, silently gazed at the flower and broke into a broad smile.

(*iv*) The origin of Zen Buddhism is ascribed to the Flower Sermon, the earliest source which comes from the 14th century.

(*v*) The Buddha silently help up and twirled a flower and twinkled his eyes, several of his disciples tried to interpret what this meant though none of them was correct.

(B) Fill in the blanks with the appropriate word from the given options : 7

Every day for a whole year, all kind of holy men, hermits, scholars and nobles came, and related to the priests their deeds of __(1)__, and the priests in solemn council heard their calms. At last, they decided that the one who seemed to the three greatest lover of ___(2)___ was a rich man who had that very year given all his __(3)__ to the poor. So they gave him the plate of gold, but when he took it in his hand, it turned into __(4)__ lead; thought, when he dropped it on the floor, to his __(5)__, it become gold again.

(*i*) Charity/kindness/happiness/sympathy

(*ii*) Destitute/Money/less/Mankind/Women

(*iii*) Wealth/Energy/time/Life

(*iv*) Gold/Worthy/Worthless/Valuable

(*v*) Confusion/Happiness/admiration/Amazement

4. Discuss the steps to write an effective Research Paper. 15

Or

(*a*) Write an email to you frined to invite him/her for your parents' marriage anniversary. 8

(*b*) What are the Meeting Minutes ? What is should contain ? 7

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

(*a*) Freedom of opinions and Expressions

(*b*) Three types of Narration

(*c*) Importance of Vocabulary

(*d*) Job Application

(*e*) Steps to write Moral Stories.

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

PB—23—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(New Course)

BIOTECHNOLOGY

Paper–AD-35

(Microbiology–II)

(Friday, 12-4-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

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

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

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

1. Describe nutritional requirements of Microorganisms. 15

Or

(*i*) Describe streak plate method. 8

(*ii*) Describe active transport. 7

2. Describe bacterial growth curve. 15

Or

(*i*) Describe continuous culture. 8

(*ii*) Describe diauxic growth. 7

P.T.O.

3. Describe heat sterilization. 15

Or

(*i*) Describe radiation sterilization. 8

(*ii*) Describe Pasteurization. 7

4. Describe chemotherapeutic agents. 15

Or

(*i*) Describe halogens as disinfectant. 8

(*ii*) Describe sterilizing gases. 7

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

(*i*) Synchronous culture

(*ii*) Tyndallization

(*iii*) Chemostat

(*iv*) Phenols as disinfectant

(*v*) Spread plate method.

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

PB—09—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(New Pattern)

BIOTECHNOLOGY

(Principle of Genetics)

(Friday, 05-04-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

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

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

1. Write in brief about complementary gene and supplementary gene. 15

Or

(*a*) Explain in detail multiple allele. 8

(*b*) Describe in detail Mendel's laws of segregation. 7

2. Describe in brief crossing over. 15

Or

(*a*) Structural changes in chromosomes. 8

(*b*) Numerical changes in chromosomes. 7

3. What is Mutation ? Describe in detail spontaneous mutation. 15

Or

(*a*) Base analogue and Acridine dyes. 8

(*b*) UV light and Alkylating agents. 7

4. Describe in detail transduction. 15

Or

(*a*) Plasmid 8

(*b*) Conjugation. 7

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

(*a*) Duplicate gene

(*b*) Linkage

(*c*) Classical and modern gene concept

(*d*) Transposable element

(*e*) Transformation.

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

PB—08—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(New Course)

BIOTECHNOLOGY

(Advanced Cell Biology)

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

Time—3 *Hours* *Maximum Marks*—75

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

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

(*iii*) Draw neat diagrams wherever necessary.

1. Explain in brief structural organization of prokaryotes. 15

Or

(*a*) Describe in detail cell theory. 8

(*b*) Write a note on plant cell. 7

2. Describe in detail structure and function of mitochondria. 15

Or

(*a*) Write a note on microtubules. 8

(*b*) Explain structure and functions of Golgi apparatus. 7

3. Explain in detail phagocytosis. Add a note on pinocytosis. 15

Or

(*a*) Write a note on simple diffusion. 8

(*b*) Describe in detail osmosis. 7

4. Describe in detail meiosis. 15

Or

(*a*) Explain in brief gap junction. 8

(*b*) Write a note on G-protein coupled receptor. 7

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

(*a*) Prokaryotes

(*b*) Chloroplast

(*c*) Endocytosis

(*d*) Plasmodesmata

(*e*) Introduction of Cancer Biology.

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

PB—21—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(New Course)

BIOTECHNOLOGY

(Bioinstrumentation Techniques)

(Wednesday, 10-04-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

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

(*ii*) Each question carries equal marks.

(*iii*) Draw a well labelled diagram wherever necessary.

1. Describe in detail compound microscope with advantages and disadvantages. 15

Or

(*a*) SEM 8

(*b*) Basic law of absorption. 7

2. Write a detailed note on ion exchange chromatography. 15

Or

(*a*) Write a note on TLC. 8

(*b*) Write a note on paper chromatography. 7

3. Describe in detail types of rotor with its advantages. 15

Or

(*a*) Basic principle of centrifugation. 8

(*b*) Centrifugal force. 7

4. What is electrophoresis ? Describe pulse field gel electrophoresis. 15

Or

(*a*) Agarose gel electrophoresis. 8

(*b*) Factors affecting on electrophoresis mobility. 7

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

(*i*) Phase contrast microscope

(*ii*) Column chromatography

(*iii*) Types of centrifuges

(*iv*) PAGE.

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

PB—03—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(New Pattern)

BIOTECHNOLOGY

(Metabolism)

(Tuesday, 02-04-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

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

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

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

1. Describe in detail dark reactions of photosynthesis. 15

Or

Write notes on :

(*a*) C_2 Pathway 8

(*b*) Components of photosynthesis. 7

2. Describe in detail TCA cycle. 15

Or

(*a*) Explain glycolysis pathway. 8

(*b*) Explain ETC. 7

3. Describe in detail β-oxidation of polyunsaturated fatty acid with example. 15

Or

(*a*) Explain β-oxidation of saturated fatty acid. 8

(*b*) Write a note on urea cycle. 7

4. Describe in detail synthesis of saturated fatty acid. 15

Or

(*a*) Explain regulation of fatty acid synthesis. 8

(*b*) Explain mitochondrial chain elongation. 7

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

(*a*) C_4 pathway

(*b*) Anaerobic respiration

(*c*) Inhibitors of ETC

(*d*) Carnitine Shuttle

(*e*) Transamination of amino acids.

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

PB—14—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(New Pattern)

BIOTECHNOLOGY

(Molecular Biology)

(Saturday, 06-04-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

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

(*ii*) Each question carries equal marks.

1. Describe in detail steps involved in prokaryotic DNA replication. 15

Or

(*a*) Describe in detail Watson and Crick's model of DNA. 8

(*b*) Explain in detail Direct DNA repair. 7

2. Explain in detail prokaryotic transcription. 15

Or

(*a*) Describe in detail Eukaryotic initiation mechanism in transcription. 8

(*b*) Explain the process of intensplicity and poly-adenylation. 7

3. Explain in detail mechanism of Eukaryotic translation. 15

Or

(*a*) Explain in brief role of *m*RNA, *t*RNA and *r*RNA. 8

(*b*) Explain in brief process of protein folding and add a note on glycosylation. 7

4. Explain in detail tryprophan operon. 15

Or

(*a*) Describe in detail positive regulation of lactose operon. 8

(*b*) Explain various properties of genetic code. 7

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

(*i*) DNA Polymerase

(*ii*) SOS Repair

(*iii*) 5$^{\perp}$ Capping

(*iv*) Proteolytic processing in proteins

(*v*) Negative regulation of lac operon.

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

PB—22—2024

FACULTY OF SCIENCE AND TECHNOLOGY

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

APRIL/MAY, 2024

(New Pattern)

BIOTECHNOLOGY

Paper–DSEBT–4CII

(Plant Physiology)

(Wednesday, 10-04-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

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

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

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

1. Give an account of the importance and significance of water in plant physiology. 15

Or

(*a*) Describe pressure flow theory. 8

(*b*) Give the composition of phloem sap. 7

2. Describe ultra-structure of Chloroplast and functions. 15

Or

(*a*) Describe photosynthetic pigments. 8

(*b*) Give salient features of C4 plants. 7

3. Describe ultra-structure of mitochondria and functions. 15

Or

(*a*) Describe glycolysis 8

(*b*) Describe ETC 7

4. Give an account of different types of stresses in plants. 15

Or

(*a*) Describe Auxin and Cytokinin 8

(*b*) Describe xenobiotic 7

5. Write notes on any *three* : 15

(*i*) Ethylene

(*ii*) Fermentation

(*iii*) ATP Synthesis

(*iv*) Path of carbon in photosynthesis

(*v*) Transpiration.

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

PB—19—2024

FACULTY OF SCIENCE

B.Sc. (Third Year) (Sixth Semester) EXAMINATION

APRIL/MAY, 2024

(New Course)

BIOTECHNOLOGY

(Agriculture Biotechnology)

(Wednesday, 10-04-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

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

(*ii*) *All* questions are compulsory.

(*iii*) Draw neat diagram wherever necessary.

1. Describe in detail Symbiotic Nitrogen Fixation. 15

Or

(*a*) Write a note on Diazotrophy. 8

(*b*) Explain in brief Phytoharmones. 7

2. Explain in detail Rhizobium inoculant. 15

Or

(*a*) Describe in detail Sulphur and Phosphate solubilizing Biofertilizer. 8

(*b*) Write a note on application of Biofertilizer. 7

3. Describe in brief citrus canker of lemon. 15

Or

(*a*) Powdery mildew of wheat. 8

(*b*) Host-Pathogen Relationship. 7

4. What are Biopesticides ? Explain in detail types of Biopesticides. 15

Or

(*a*) Mushroom Production 8

(*b*) SCP 7

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

(*i*) Assimilation of Sulphur

(*ii*) Blue Green Algae as a Biofertilizer

(*iii*) Whip smut of sugarcane

(*iv*) Biomass as a energy source

(*v*) Nitrogenase complex.

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

PB—11—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(New Pattern)

BIOTECHNOLOGY

(Applied and Medical Microbiology)

(Friday, 05-04-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

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

(*ii*) Draw neat and well labelled diagrams wherever necessary.

1. Describe in detail enumeration and significance of microorganisms in air. 15

Or

(*a*) Explain symbiotic and non-symbiotic type of nitrogen fixation. 8

(*b*) What are the main parts and functions of phosphorus cycle ? 7

2. Describe in detail presumptive, confirmative and complete test for coliforms. 15

Or

(*a*) Explain IMViC test and comment on its significance. 8

(*b*) Describe standard plate count technique. 7

3. What is epidemiology ? Describe in detail sporadic, endemic and pandemic diseases. 15

Or

(*a*) Describe types and symptoms of nosocomial infections. 8

(*b*) Explain types, symptoms and causes of waterborne infections. 7

4. Describe in detail morphology, symptoms, diagnosis, preventive measures and chemotherapy for swine flu. 15

Or

(*a*) Write about symptoms and preventive measures of malaria. 8

(*b*) Write about symptoms and preventive measures of AIDS. 7

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

(*i*) Typhoid

(*ii*) Carbon cycle

(*iii*) Microbial spoilage of food

(*iv*) Types of water

(*v*) Membrane filter technique.

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

PB—05—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(New Course)

BIOTECHNOLOGY

(Basics of Enzymology)

(Wednesday, 03-04-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

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

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

1. Describe in detail nomenclature and classification of enzyme. 15

Or

(*a*) Explain ribozymes and metal activated enzymes. 8

(*b*) Discuss general characteristics of enzyme. 7

2. Define enzyme inhibition. Discuss reversible and irreversible inhibition. 15

Or

(*a*) Describe mechanism of acid-base enzyme catalysis. 8

(*b*) Discuss enzyme active site and types of specificity. 7

3. Describe in detail immobilization of enzyme and its applications. 15

Or

(*a*) Discuss molecular weight determination of enzyme using SDS-PAGE 8

(*b*) Explain purification of enzyme using salt precipitation method. 7

4. Describe in detail Michealis-Menten equation. 15

Or

(*a*) Define Allosteric enzymes. Discuss Kinetics of Allosteric enzymes 8

(*b*) Discuss the significance of K_m and V_{max} 7

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

(*a*) Dialysis

(*b*) LB plot

(*c*) Lock and key model of enzyme

(*d*) Coenzymes and cofactor

(*e*) Enzyme activity.

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

PB—17—2024

FACULTY OF SCIENCE

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

APRIL/MAY, 2024

(New Course)

BIOTECHNOLOGY

(CBCS/New Pattern)

(Immunology and Virology) (CCBT–3D)

(Monday, 08-04-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

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

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

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

1. Define immunity. Describe in detail factors affecting on Innate immunity. 15

Or

(*a*) Explain structure and function of lymph node. 8

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

2. Define antigen. Describe factors affecting on antigen. 15

Or

(*a*) Describe structure of Antibody. 8

(*b*) Explain Agglutination reactions. 7

P.T.O.

3. Define Virus ? Describe in detail ICTV (ICNV) classification of viruses. 15

Or

(*a*) Describe symmetry of virus. 8

(*b*) Write a note on Lysogeny cycle. 7

4. Describe structure, pathogenesis and treatment of HIV. 15

Or

(*a*) Describe TMV. 8

(*b*) Describe λ phage. 7

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

(*i*) Adaptive immunity

(*ii*) IgA

(*iii*) LHT Classification

(*iv*) Ebola virus

(*v*) Vaccines.

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

PB—26—2024

FACULTY OF SCIENCE

B.Sc. (Fourth Semester) EXAMINATION

APRIL/MAY, 2024

(New Pattern)

BIOTECHNOLOGY

(Plant Tissue Culture)

(Friday, 12-4-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

N.B. :— All questions are compulsory.

1. Explain the concept of Plant tissue culture. Describe in detail organization of a plant tissue culture Laboratory. 15

Or

(*a*) Describe in detail various components of a plant tissue culture media. 8

(*b*) Explain various techniques of Sterilization used in P.T.C. 7

2. Describe in detail technique of Haploid production. 15

P.T.O.

Or

(*a*) Describe in detail various types of cultures. 8

(*b*) Explain in detail the technique of Micropropagation. 7

3. Explain in detail techniques of cell suspension culture for production of secondary metabolites. 15

Or

(*a*) Explain the technique of gametoclonal variation. 8

(*b*) Explain the technique of Embryo culture. 7

4. Explain the concept of Germplasm conservation. Explain in detail Cryopreservation. 15

Or

(*a*) Explain the technique of Somatic hybridization. 8

(*b*) Explain the technique of Endosperm culture. 7

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

(*a*) Somatic embryogenesis

(*b*) Somaclonal variation

(*c*) Synthetic Seed

(*d*) Cybrids.

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

PB—24—2024

FACULTY OF SCIENCE

B.Sc. (Third Year) (Fifth Semester) EXAMINATION

APRIL/MAY, 2024

(New Pattern)

BIOTECHNOLOGY

(Paper–CCBT-3E)

(Bioprocess Technology)

(Friday, 12-4-2024) **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 a well labelled diagrams wherever necessary.

1. Define Bioreactor. Explain in detail construction, design and operation of Bioreactor. 15

Or

(*a*) Explain welding, surface treatment components and specification of the fermenters. 8

(*b*) Explain in detail materials of construction of fermenter. 7

P.T.O.

2. Define sterilization. Explain in detail media sterilization with principle and mechanism. 15

Or

(*a*) Define media. Explain in detail constituents of design of media. 8

(*b*) Describe design of sterilization cycle using kinetics of thermal death of microbes. 7

3. Define Growth. Explain in detail batch and continuous culture kinetics. 15

Or

(*a*) Explain in detail effect of temperature on cell growth. 8

(*b*) Give an account on strategies of fermentation control. 7

4. Explain in detail quality control and quality assurance. 15

Or

(*a*) Describe scale up in Bioprocesses fermentation. 8

(*b*) Give an account on foam and its control. 7

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

(*a*) Fermenter

(*b*) Decimal reduction

(*c*) Fed batch culture

(*d*) SOP

(*e*) Costing of media.

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

PB—16—2024

FACULTY OF SCIENCE AND TECHNOLOGY

B.Sc. (Third Year) (Fifth Semester) EXAMINATION

APRIL/MAY, 2024

(New Course)

BIOTECHNOLOGY

(Developmental Biology)

(Monday, 08-04-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

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

(*ii*) Each question carries equal marks.

1. Describe in detail competence, determination and commitment. Explain each with an example. 15

Or

(*a*) Explain in brief about fertilization. 8

(*b*) Describe in detail organogenesis in frog. 7

2. Describe in detail developmental stages of Drosophila. 15

Or

(*a*) What is stem cell ? Describe in detail different types of stem cells. 8

(*b*) What is progenitor cells ? Explain in detail cell lineages in animal.

P.T.O.

7

3. What is seedling development ? Explain floral patterning in Arabidopsis.

15

Or

(*a*) Write a note on meristem structure. 8

(*b*) Describe in detail photomorphogenesis. 7

4. What is transgenic technology ? Explain its application in plant and animal.

15

Or

(*a*) Write a note on concept of test tube baby. 8

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

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

(*i*) Types of Cleavage

(*ii*) Apoptosis

(*iii*) Hybrid

(*iv*) Embryoculture

(*v*) Patterns of Cleavage.

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

1001—2024

FACULTY OF ALL

B.A./B.Com./B.Sc. (Fifth Semester) EXAMINATION

APRIL/MAY, 2024

ENVIRONMENTAL STUDIES (Compulsory)

पर्यावरण अभ्यास (अनिवार्य)

(Wednesday, 03-04-2024) **Time : 10.00 a.m. to 12.00 noon**

Time—2 *Hours* *Maximum Marks*—40

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

(*ii*) Illustrate your answer with suitable labelled diagram wherever necessary.

(*i*) **सर्व** प्रश्न सोडवा.

(*ii*) आवश्यकता असेल तेथे आकृती काढून नावे घ्या.

1. Write in detail non-renewable resources. 15

क्षयक्षम साधन संपत्ती बद्दल सविस्तर माहिती लिहा.

P.T.O.

Or

(किंवा)

(A) Define ecosystem and explain grassland ecosystem. 8

परिसंस्था म्हणजे काय ? गवताळ परिसंस्थे बद्दल माहिती द्या.

(B) Describe conservating of biodiversity. 7

जैवविविधतेचे संवर्धन बद्दल वर्णन करा.

2. Define air pollution. Describe its sources, effects and control measures. 15

'हवा प्रदूषण म्हणजे काय ? हवा प्रदूषणाची कारणे, परिणाम व नियंत्रण ह्या बद्दल माहिती विशद करा.

Or

(किंवा)

(A) What is ecological successing ? 8

परिस्थितीक अनुक्रम म्हणजे काय ?

(B) Values of biodiversity. 7

जैवविविधतेचे मूल्य.

3. Write short notes on (any *two*) : 10

(*a*) Draught

(*b*) Soil erosion

(*c*) Pond

(*d*) Food Web.

थोडक्यात टिपा लिहा (कोणतेही **दोन**) :

(अ) दुष्काळ

(ब) जमीनीची धुप

(क) तळे

(ड) अन्न जाळे.

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

PB—13—2024

FACULTY OF SCIENCE

B.Sc. (Third Year) (Sixth Semester) EXAMINATION

APRIL/MAY, 2024

(New Pattern)

BIOTECHNOLOGY

(Environmental Biotechnology)

(Saturday, 06-04-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

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

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

1. Describe industrial waste water treatment in detail. 15

Or

(*a*) Activated sludge process 8

(*b*) Rotating Biological contactors 7

2. Describe solid waste management with advantages. 15

Or

(*a*) Aerobic degradation pathway 8

(*b*) Anaerobic degradation pathway 7

P.T.O.

3. What is bioremediation ? Describe methods of bioremediation with advantages and disadvantages. 15

Or

(*a*) Phytoremediation 8

(*b*) Bioremediation of Soil 7

4. Describe pesticide degradation principle with suitable example. 15

Or

(*a*) Cytochrome-P450 system 8

(*b*) Herbicide degradation 7

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

(*i*) Packed bed reactor

(*ii*) Biodegradation of Hydrocarbon

(*iii*) Concept of Bioremediation

(*iv*) Xenobiotics

(*v*) Plasmid borne metabolic activities.

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

PB—07—2024

FACULTY OF SCIENCE

B.Sc. (Third Year) (Sixth Semester) EXAMINATION

APRIL/MAY, 2024

(New Pattern)

BIOTECHNOLOGY

(Industrial Biotechnology)

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

Time—3 *Hours* *Maximum Marks*—75

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

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

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

1. What is strain improvement ? Describe isolation of mutants which do not recognize presence of inhibitors. 15

Or

(*a*) Describe isolation of mutants which do not produce feedback inhibitors. 8

(*b*) Describe modification of permeability. 7

2. Describe centrifugation. 15

Or

(*a*) Describe drying 8

(*b*) Describe ultrafiltration. 7

3. Describe penicillin production. 15

Or

(*a*) Describe pectinase production. 8

(*b*) Describe vitamin B_2 production. 7

4. Describe GMP 15

Or

(*a*) Describe GLP. 8

(*b*) Describe pyrogen testing 7

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

(*a*) QA

(*b*) Sterility testing

(*c*) Reverse Osmosis

(*d*) Ion-exchange chromatography

(*e*) Erythromycin production.

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

PB—02—2024

FACULTY OF SCIENCE

B.Sc. (Third Year) (Sixth Semester) EXAMINATION

APRIL/MAY, 2024

(New Course)

BIOTECHNOLOGY

(Pharmaceutical Biotechnology)

(Tuesday, 02-04-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

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

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

1. What are secondary metabolites ? Explain their types and add a note on the factors that affect production of secondary metabolites. 15

Or

(*a*) Explain production of secondary metabolites by hair root culture. 8

(*b*) Explain various medicinal applications of plant secondary metabolites. 7

2. What are antibiotics ? Explain classification of antibiotic based on mode of action and chemical groups attached to them. 15

Or

(*a*) Explain principle and methods of microbial assay. 8

(*b*) Explain various types of microbial resistance to antibiotics. 7

3. Describe in detail mechanism of action of antihypertensive drugs. 15

Or

(*a*) Explain structure and mechanism of action of Quinolones and Sulfonamides. 8

(*b*) Explain in detail structure and mode of action of Nystatin and Griseofulvin. 7

4. What is drug development ? Explain in brief various stages involved in drug development process. 15

Or

(*a*) Explain various drug delivery systems. 8

(*b*) Explain the concept of pharmacokinetics. 7

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

(*a*) International Pharmacopoeia

(*b*) Antidiabetic drugs

(*c*) Azidothymidine

(*d*) Chemoinformatics

(*e*) Pharmacodynamics.