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

# VB—03—2024

**FACULTY OF SCIENCE**

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

**NOVEMBER/DECEMBER, 2024**

**(New Pattern)**

BIOTECHNOLOGY

Paper–CCBT-1C

(Metabolism)

**(Tuesday, 26-11-2024)** **Time : 2.00 p.m. to 5.00 p.m.**

*Time*—3 *Hours* *Maximum Marks*—75

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

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

(*iii*) Draw well labelled diagram if necessary.

1. Define photosynthesis. Describe in detail light reaction. 15

*Or*

Write notes on :

(*a*) Calvin Cycle 8

(*b*) Photorespiration. 7

2. Describe Kreb cycle. Add a note on its energetics. 15

P.T.O.

*Or*

(*a*) Explain irreversible reactions of Glycolysis. 8

(*b*) Write a note on components of Electron Transport Chain. 7

3. Describe β-oxidation of Fatty acid. Add a note on its energetics. 15

*Or*

(*a*) Explain mechanism of Transamination. 8

(*b*) Describe Urea Cycle. 7

4. Describe Fatty Acid synthesis. 15

*Or*

Write notes on :

(*a*) Structure of FAS complex. 8

(*b*) Regulation of Fatty Acid synthesis. 7

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

(*a*) CAM plants

(*b*) Oxidative deamination

(*c*) Ethanol Fermentation

(*d*) Oxidation of odd chain Fatty Acid

(*e*) Carnitine Shuttle.

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# VB—08—2024

**FACULTY OF SCIENCE**

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

**NOVEMBER/DECEMBER, 2024**

**(New Pattern)**

BIOTECHNOLOGY

Paper–CCBT–2C

(Advanced Cell Biology)

**(Thursday, 28-11-2024)** **Time : 2.00 p.m. to 5.00 p.m.**

*Time*—3 *Hours* *Maximum Marks*—75

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

(*ii*) Each question carries equal marks.

(*iii*) Draw neat diagram wherever necessary.

1. Describe in detail structural organization of Prokaryotes. 15

*Or*

(*a*) Write in brief about cell theory. 8

(*b*) Explain in detail Diversity of cell size and shape. 7

2. Explain in detail structure and function of Mitochondria. 15

*Or*

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

(*b*) Describe in detail lysosomes. 7

P.T.O.

3. Explain in detail passive transport. 15

*Or*

(*a*) Write a note on Na/K ion channel. 8

(*b*) Describe in brief active transport. 7

4. What is mitosis ? Explain in detail various phases of mitosis. 15

*Or*

(*a*) Explain in detail Gap junction. 8

(*b*) Describe in brief cell cycle. 7

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

(*a*) Plant cells

(*b*) Endoplasmic reticulum

(*c*) Phagocytosis

(*d*) Plasmodesmata

(*e*) Peroxisomes.

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

# VB—14—2024

**FACULTY OF SCIENCE**

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

**NOVEMBER/DECEMBER, 2024**

**(New Pattern)**

BIOTECHNOLOGY

(Molecular Biology)

**(Saturday, 30-11-2024)** **Time : 2.00 p.m. to 5.00 p.m.**

*Time*—3 *Hours* *Maximum Marks*—75

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

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

(*iii*) Draw labelled diagrams wherever necessary.

1. Describe in detail prokaryotic DNA replication. 15

*Or*

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

(*b*) Describe in detail mismatch repair mechanism of DNA. 7

2. Explain in detail various steps involved in Eukaryotic RNA synthesis. 15

*Or*

(*a*) Describe structure of RNA polymerase II. 8

(*b*) Explain in detail co-transcriptional modification of *m*-RNA. 7

P.T.O.

3. Explain in detail prokaryotic translation. 15

*Or*

(*a*) Explain in detail Eukaryotic Initiation step of translation. 8

(*b*) Explain structure and role of *t*-RNA. 7

4. Explain in detail tryptophan operon. 15

*Or*

(*a*) Explain negative regulation of lactose in bacteria. 8

(*b*) Describe positive regulation of lactose sugar in bacteria. 7

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

(*a*) SOS Repair

(*b*) Removal Introns from *m*-RNA

(*c*) Heat shock proteins

(*d*) Regulatory genes.

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

# VB—18—2024

**FACULTY OF SCIENCE AND TECHNOLOGY**

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

**NOVEMBER/DECEMBER, 2024**

**(New Pattern)**

BIOTECHNOLOGY

Paper–I

(Microbiology)

**(Tuesday, 3-12-2024)** **Time : 10.00 a.m. to 1.00 p.m.**

*Time*—3 *Hours* *Maximum Marks*—75

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

(*ii*) Draw neat diagram wherever necessary.

1. Describe in detail discovery of anaerobic life and physiological significance of fermentation. 15

*Or*

(*a*) Write a short note on micrographia of Anton Von Leeuwenhoek. 8

(*b*) Write a short note on Aristotle's notion about spontaneous generation. 7

2. Describe in detail soil and agricultural microbiology. 15

P.T.O.

*Or*

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

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

3. Describe in detail Gram positive and Gram negative cell wall of bacteria. 15

*Or*

(*a*) Write a short note on flagella and pili of bacteria. 8

(*b*) Write a short note on PHB granules. 7

4. Describe in detail structure and function of eukaryotic cell. 15

*Or*

(*a*) Differentiate between Endospore and Exospore. 8

(*b*) Write a short note on Sporulation of endospore. 7

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

(*a*) Koch's Postulates

(*b*) Medical microbiology

(*c*) Gas vesicles

(*d*) Golgi complex

(*e*) Geomicrobiology.

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

# VB—22—2024

**FACULTY OF SCIENCE AND TECHNOLOGY**

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

**NOVEMBER/DECEMBER, 2024**

**(New Pattern)**

BIOTECHNOLOGY

Paper–DSEBT-4CII

(Plant Physiology)

**(Tuesday, 3-12-2024)** **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. Describe the mechanism of translocation of organic solutes. 15

*Or*

(*i*) Describe diffusion and guttation. 8

(*ii*) Describe pressure flow theory. 7

2. Describe cyclic and non-cyclic Photophosphorylation. 15

*Or*

(*i*) Describe photosynthetic pigments. 8

(*ii*) Describe Photorespiration. 7

P.T.O.

3. Describe TCA cycle. 15

*Or*

(*i*) Describe ETC. 8

(*ii*) Describe types of respiration. 7

4. Give an account of salinity stress and drought stresses in plants. 15

*Or*

(*i*) Describe Phytohormone. 8

(*ii*) Describe biotic stress. 7

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

(*a*) Abscisic acid

(*b*) Glycolysis

(*c*) CAM pathway

(*d*) Transpiration

(*e*) Importance of respiration.

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

# VB—05—2024

**FACULTY OF SCIENCE**

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

**NOVEMBER/DECEMBER, 2024**

**(New Pattern)**

BIOTECHNOLOGY

Paper–CCBT–1D

(Basic Enzymology)

**(Wednesday, 27-11-2024)** **Time : 2.00 p.m. to 5.00 p.m.**

*Time*—3 *Hours* *Maximum Marks*—75

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

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

(*iii*) Draw neat and well diagrams if necessary.

1. Describe in detail classification of enzymes. 15

*Or*

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

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

2. Describe in detail acid-base catalysis. 15

*Or*

(*a*) Discuss active site of enzymes. 8

(*b*) Write in detail reversible inhibition. 7

P.T.O.

3. Describe in detail SDS-PAGE. 15

*Or*

(*a*) Discuss ion exchange chromatography. 8

(*b*) Give an account on PAGE. 7

4. Describe in detail kinetics of enzyme inhibition. 15

*Or*

(*a*) Discuss factors affecting enzyme activity. 8

(*b*) Give an account on Km and Vmax. 7

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

(*a*) Metalloenzymes

(*b*) Induced fit model

(*c*) Ultrafiltration

(*d*) Allosteric enzymes

(*e*) Enzyme activity.

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

# VB—11—2024

## FACULTY OF SCIENCE

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

**NOVEMBER/DECEMBER, 2024**

**(New Pattern)**

BIOTECHNOLOGY

CCBT–2D

(Applied and Medical Microbiology)

**(Friday, 29-11-2024)** **Time : 2.00 p.m. to 5.00 p.m.**

*Time*—3 *Hours* *Maximum Marks*—75

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

(*ii*) Each question carries equal marks.

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

1. What is nitrogen fixation ? Describe symbiotic nitrogen fixation in brief. 15

*Or*

(*a*) Sulphur cycle. 8

(*b*) Enumeration of microorganisms from air. 7

P.T.O.

2. Describe in brief MPN and SPC. 15

*Or*

(*a*) Microbial spoilage of food. 8

(*b*) Food preservation by high temperature. 7

3. Describe in detail normal flora of human body. 15

*Or*

(*a*) Reservoirs of infections 8

(*b*) Nosocomial infections 7

4. Explain in brief morphology, pathogenesis, symptoms, diagnosis and preventive measure for AIDS. 15

*Or*

(*a*) Typhoid 8

(*b*) Malaria 7

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

(*a*) Carbon cycle

(*b*) IMVIC

(*c*) Septicemia

(*d*) Cholera

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

# VB—17—2024

**FACULTY OF SCIENCE**

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

**NOVEMBER/DECEMBER, 2024**

**(New Pattern)**

BIOTECHNOLOGY

Paper–CCBT-3D

(Immunology and Virology)

**(Monday, 2-12-2024)** **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 wherever necessary.

1. Describe in detail cells of immune system. 15

*Or*

(*a*) Explain structure and function of spleen. 8

(*b*) Describe Adaptive immunity. 7

2. Define Antibody. Describe in detail biological properties and functions of Immunoglobulins. 15

P.T.O.

*Or*

(*a*) Explain Agglutination reactions. 8

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

3. Define virus. Describe in detail LHT classification of virus. 15

*Or*

(*a*) Describe lytic and lysogeny cycle of Bacteriophage. 8

(*b*) Explain ultrastructure of virus. 7

4. Describe in detail structure and life cycle of TMV. 15

*Or*

(*a*) Describe HIV structure. 8

(*b*) Write a note on Corona Virus. 7

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

(*a*) Innate immunity

(*b*) Precipitation

(*c*) Symmetry of virus

(*d*) Adenovirus

(*e*) Ebolavirus.

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

# VB—26—2024

**FACULTY OF SCIENCE**

**B.Sc. (Fourth Semester) EXAMINATION**

**NOVEMBER/DECEMBER, 2024**

**(New Pattern)**

BIOTECHNOLOGY

Paper–DSEBT–4D II

(Plant Tissue Culture)

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

*Time*—3 *Hours* *Maximum Marks*—75

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

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

(*iii*) Draw neat and well labelled diagram if necessary.

1. Describe in detail organization of plant tissue culture Laboratory. 15

*Or*

Write notes on :

(*a*) De-differentiation and Re-differentiation. 8

(*b*) Components of plant tissue culture media. 7

P.T.O.

2. Define types of plant tissue culture. Add a note on cell suspension culture. 15

*Or*

(*a*) Micropropagation. 8

(*b*) Anther culture. 7

3. Describe in detail commercial production of secondary metabolites. 15

*Or*

Write notes on :

(*a*) Cryopreservation. 8

(*b*) Somatic Hybridization. 7

4. Describe preservation methods of plant genetic resources briefly. Add a note on Germplasm conservation. 15

*Or*

Write notes on :

(*a*) Horticulture. 8

(*b*) Ovule culture. 7

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

(*a*) Gametoclonal variation

(*b*) Endosperm culture

(*c*) Embryo rescue

(*d*) Pollen culture

(*e*) Protoplast culture.