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

VA—1001—2024

FACULTY OF ALL FACULTIES

All (Third Year) (Fifth Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

(CBCS/New Pattern)

ENVIRONMENTAL STUDIES (Compulsory)

पर्यावरण अभ्यास (अनिवार्य)

Paper–V

(Wednesday, 27-11-2024) **Time : 10.00 a.m. to 12.00 noon**

Time—2 *Hours* *Maximum Marks*—40

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

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

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

(*i*) **सर्व** प्रश्न सोडवा.

(*ii*) **सर्व** प्रश्नांना समान गुण आहेत.

(*iii*) आवश्यक तेथे सुबक आकृती काढून नावे द्या.

1. Write in detail the effects of modern agriculture. 15

आधुनिक शेतीमुळे होणारे दुष्परिणाम सविस्तर माहिती लिहा.

Or

(किंवा)

(*a*) Describe the importance of Environmental Study. 8

पर्यावरण अभ्यासाचे महत्त्व विशद करा.

(*b*) Describe grassland ecosystem. 7

'गवताळ परिसंस्था' विशद करा.

P.T.O.

2. Write biogeographical classification of India. 15

भारतातील सजीवांचे भौगोलिक परिस्थितीनुसार वर्गीकरण करा.

Or

(किंवा)

(*a*) Describe alternative energy source. 8

पर्यायी ऊर्जा स्रोत वर्णन करा.

(*b*) Discuss the role of an individual in pollution and abatement. 7

प्रदूषण व त्याच्या नियंत्रणात मानवाचा वैयक्तिक वाटा.

3. Write short notes any *two* : 10

(*i*) Desertification

(*ii*) Food web

(*iii*) Noise pollution

(*iv*) Environmental awareness.

खालीलपैकी कोणत्याही **दोन**वर थोडक्यात टिपा लिहा :

(*i*) वाळवंटीकरण

(*ii*) अन्न जाळे

(*iii*) ध्वनी प्रदूषण

(*iv*) पर्यावरण जागृती.

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

VB—10—2024

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2024

(New Course)

BIOTECHNOLOGY

(*r*-DNA Technology)

(Friday, 29-11-2024) **Time : 10.00 p.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 labelled diagrams wherever necessary.

1. What is gene cloning ? Explain in brief various gene cloning strategies used in *r*-DNA technology. 15

Or

(*a*) Explain various reporter genes used in gene cloning. 8

(*b*) Explain construction of M13 vector and add a note on its applications. 7

2. Describe in detail the technique of DNA micro array and explain its applications. 15

Or

(*a*) Explain in detail Maxam and Gilbert's technique of DNA sequencing. 8

(*b*) Explain in detail Northern blotting. 7

P.T.O.

3. Describe in detail the steps involved in construction of *c*-DNA library. 15

Or

(*a*) Explain in detail chemical synthesis of DNA. 8

(*b*) Describe the technique of Autoradiography of DNA. 7

4. What is protein Engineering ? Explain various strategies to improve properties of proteins and enzymes. 15

Or

(*a*) Explain the concept of Gene therapy. 8

(*b*) Describe in detail production of recombinant insulin. 7

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

(*a*) Restriction enzymes

(*b*) Agarose gel electrophoresis

(*c*) Nucleic acid probe

(*d*) Bt cotton.

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

VB—16—2024

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2024

(New Pattern)

BIOTECHNOLOGY

Paper–CCBT-2E

(Developmental Biology)

(Monday, 2-12-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

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

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

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

1. Explain types and patterns of cleavage in detail. 15

Or

(*a*) Describe developmental stages in chick in detail. 8

(*b*) Give an account on Gametogenesis and Fertilization. 7

2. Explain in detail concept of stem cells and stem cell technology with applications. 15

P.T.O.

Or

(*a*) Give an account on ageing and apoptosis. 8

(*b*) Explain in detail abnormal development. 7

3. Describe in detail development in Arabidopsis. 15

Or

(*a*) Describe in detail photomorphogenesis. 8

(*b*) Explain meristem structure and its activity. 7

4. Explain in detail transgenic technology and its applications in plants and animals. 15

Or

(*a*) Describe cloning of mammals in detail. 8

(*b*) Describe embryo culture and preservation. 7

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

(*a*) Commitment

(*b*) Concept of test tube baby

(*c*) GMOs

(*d*) Differentiations

(*e*) Competence.

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

VB—27—2024

FACULTY OF SCIENCE AND TECHNOLOGY

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

NOVEMBER/DECEMBER, 2024

(New Pattern)

BIOTECHNOLOGY

Paper–DSEBT–4E I

(Advanced Bioinformatics)

(Thursday, 5-12-2024) **Time : 10.00 a.m. to 1.00 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. What is bioinformatics ? Describe in detail the applications in bioinformatics. 15

Or

Write notes on :

(*a*) HTML. 8

(*b*) URLs. 7

P.T.O.

2. Describe in detail the Local alignment and Global alignment. 15

Or

Write notes on :

(*a*) Cn3D. 8

(*b*) PyMol. 7

3. Describe in brief Primary databases. 15

Or

Write notes on :

(*a*) PDB. 8

(*b*) PubChem. 7

4. Describe Protein secondary structure prediction methods. 15

Or

Write notes on :

(*a*) Homology modeling. 8

(*b*) Domain. 7

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

(*i*) Role of internet

(*ii*) Rasmol

(*iii*) Pubmed

(*iv*) Motif.

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

VB—28—2024

FACULTY OF SCIENCE & TECHNOLOGY

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

NOVEMBER/DECEMBER, 2024

(New Course))

BIOTECHNOLOGY

(Medical Biotechnology)

(Thursday, 05-12-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

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

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

1. Describe in detail protein based vaccines. 15

Or

(*a*) Write a brief note on plant based vaccines. 8

(*b*) Prepare a draft on stem cell therapy. 7

2. Explain in detail the production of monoclonal antibodies. 15

Or

(*a*) Give the role of ELISA in the diagnosis of bacterial disease. 8

(*b*) Write a note on western blot technique. 7

P.T.O.

3. Define stem cell. Explain in detail properties and potency of stem cells. 15

Or

(*a*) Elaborate the concept of tissue engineering. 8

(*b*) Give the clinical applications of embryonic stem cells. 7

4. What are oncogenes ? Describe in detail the cell cycle with respect to cancer. 15

Or

(*a*) Describe the defects in complement system. 8

(*b*) Write a brief not on secondary immunodeficiency with an example. 7

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

(*a*) Role of scaffolds

(*b*) Cell based vaccine

(*c*) Tumor supressor genes

(*d*) SCID

(*e*) Conjugate vaccine

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

VB—07—2024

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2024

(New Pattern)

BIOTECHNOLOGY

Paper–CCBT–2F

(Industrial Biotechnology)

(Thursday, 28-11-2024) **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 a well labelled diagram wherever necessary.

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

1. Explain in detail isolation and selection of mutants producing improved level of primary metabolites with suitable example. 15

Or

(*a*) Describe in detail isolation of mutants which do not produce feedback inhibitors or repressor ? 8

(*b*) Explain isolation of mutants which do not recognize presence of inhibitors or repressors. 7

2. Explain in detail physical and chemical method of cell disruption. 15

P.T.O.

Or

(*a*) Explain in detail filtration for removal of cell mass. 8

(*b*) Give an account on ultrafiltration and reverse osmosis. 7

3. Explain in detail production of citric acid with their applications. 15

Or

(*a*) Explain in detail production of penicillin. 8

(*b*) Explain in detail production of protease. 7

4. Explain in detail sterility, pyrogen, toxicity and carcinogenicity testing. 15

Or

(*a*) Describe concept of QC and QA. 8

(*b*) Give an account on fermentation economics. 7

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

(*a*) Modification of permeability

(*b*) HPLC

(*c*) Vitamin B_{12}

(*d*) GMP

(*e*) Solvent recovery.

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

VB—24—2024

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2024

(New Pattern)

BIOTECHNOLOGY

Paper–CCBT-3E

(Bioprocess Technology)

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

Time—3 *Hours* *Maximum Marks*—75

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

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

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

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

Or

(*a*) Define Bioprocess Engineering. Explain in detail materials of construction of fermenter. 8

(*b*) Explain in detail specification of the fermenter. 7

2. Define media. Explain in detail Design of media and their optimization. 15

P.T.O.

Or

(*a*) Explain in detail principles, mechanism of capture of particles in air. 8

(*b*) Give difference between Depth and Screen filters. 7

3. Explain in detail effect of pH and temperature on cell growth. 15

Or

(*a*) Explain in detail fed-batch culture kinetics with application. 8

(*b*) Define Bioproduct. Describe in detail classification of bioproducts. 7

4. Describe in detail scale up in bioprocess fermentations and factors used in scale up. 15

Or

(*a*) Give an account on standard operating procedures and GMP. 8

(*b*) Explain computer control fermentations in detail. 7

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

(*a*) Aeration and agitation

(*b*) Media sterilization

(*c*) Measurement of O_2/CO_2

(*d*) OUR

(*e*) Viscosity and its control.

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

VB—07—2024

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2024

(New Pattern)

BIOTECHNOLOGY

Paper–CCBT–2F

(Industrial Biotechnology)

(Thursday, 28-11-2024) **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 a well labelled diagram wherever necessary.

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

1. Explain in detail isolation and selection of mutants producing improved level of primary metabolites with suitable example. 15

Or

(*a*) Describe in detail isolation of mutants which do not produce feedback inhibitors or repressor ? 8

(*b*) Explain isolation of mutants which do not recognize presence of inhibitors or repressors. 7

2. Explain in detail physical and chemical method of cell disruption. 15

P.T.O.

Or

(*a*) Explain in detail filtration for removal of cell mass. 8

(*b*) Give an account on ultrafiltration and reverse osmosis. 7

3. Explain in detail production of citric acid with their applications. 15

Or

(*a*) Explain in detail production of penicillin. 8

(*b*) Explain in detail production of protease. 7

4. Explain in detail sterility, pyrogen, toxicity and carcinogenicity testing. 15

Or

(*a*) Describe concept of QC and QA. 8

(*b*) Give an account on fermentation economics. 7

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

(*a*) Modification of permeability

(*b*) HPLC

(*c*) Vitamin B_{12}

(*d*) GMP

(*e*) Solvent recovery.

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

VB—13—2024

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2024

(New Pattern)

BIOTECHNOLOGY

(Environmental Biotechnology)

(Saturday, 30-11-2024) **Time : 10.00 a.m. to 1.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

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

(*ii*) Each question carries equal marks.

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

1. Describe Anaerobic Biological treatments in detail. 15

Or

(*a*) Write a note on waste water treatment. 8

(*b*) Write a note on packed bed reactors. 7

2. Describe anaerobic degradation pathways. 15

Or

(*a*) Write a note on biodegradation of Hydrocarbon. 8

(*b*) Write a note on concept of Municipal solid waste management. 7

P.T.O.

3. What is Bioremediation ? Describe methods of Bioremediation. 15

Or

(*a*) Write a note on Bioremediation of soil. 8

(*b*) Describe phytoremediation with its advantages and disadvantages. 7

4. What is xenobiotics ? Describe pesticide degradation with example. 15

Or

(*a*) Herbicide degradation pathway. 8

(*b*) Cytochrome P450 system. 7

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

(*a*) Rotating biological contactors

(*b*) Aerobic degradation pathway

(*c*) Biodegradation

(*d*) Phase-II

(*e*) Important microorganisms in waste water treatment.