VH—16—2024

FACULTY OF SCIENCE

B.Sc. (Fifth Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

(New Course)

BIOINFORMATICS

Paper-CCBI-1E

(Genetic Engineering)

(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.

1.   Describe in detail pBR322 and pUC18/19 Plasmids.   15

Or

(a)   Explain in detail methods of Gene Transfer.   8

(b)   Write a note on markers and reporter genes in gene cloning.   7

2.   Describe in detail Southern Blotting.   15

Or

(a)   Describe in detail Maxam Gilbert's method of DNA sequencing.   8

(b)   Write a note on PCR : Mechanism, types and applications.   7

P.T.O.

3. Describe in detail cDNA library construction and applications. 15

Or

(*a*) Write a note on Screening of library. 8

(*b*) Explain in detail Autoradiography of DNA. 7

4. Explain in detail Protein engineering : Improvement in properties of proteins and enzymes. 15

Or

(*a*) Write a note on BT-Cotton and Transgenic maize. 8

(*b*) Describe in detail Pharmaceutical applications in r-DNA technology. 7

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

(*a*) DNA Ligases

(*b*) Ti plasmid

(*c*) Agarose Gel Electrophoresis

(*d*) DNA Microarray

(*e*) Nucleic Acid Probe.

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

VH—24—2024

FACULTY OF SCIENCE

B.Sc. (Fifth Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

(New Course)

BIOINFORMATICS

Paper-CCBI-3E

(Chemoinformatics)

(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.

1.   What is chemoinformatics ? Explain in detail its applications.   15

Or

(a)   Describe in detail about scope of chemoinformatics with its examples.   8

(b)   Why to use informatics methods in chemoinformatics ?   7

2.   Describe in detail about 2D structure databases with its examples.   15

Or

(a)   What is patent ? Explain patent databases with examples.   8

(b)   Explain Graph representation of Aspirin molecule.   7

P.T.O.

3. What is molecular descriptor ? Explain in detail. 15

Or

(*a*) Describe in detail screening methods. 8

(*b*) How to calculate molecular descriptor using 2D structure ? 7

4. What is meant by drug ? Describe the relationship between drug and drug targets. 15

Or

(*a*) Describe the concept of rule of five. 8

(*b*) Explain in detail about drug-likeness. 7

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

(*a*) PubChem database

(*b*) Drug

(*c*) ChEBI Database

(*d*) Toxicity prediction

(*e*) Protein ligand docking.

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

VH—10—2024

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2024

(New Pattern)

BIOINFORMATICS

Paper CCBI-3E

(Computational Structural Biology)

(Friday, 29-11-2024) **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. Enlist and describe the structural databases. Elaborate their importance in structural biology. 15

Or

(*a*) Discuss about history of structural biology. 8

(*b*) Describe X-ray crystallography technique. 7

2. What is structure visualization ? State the role of bioinformatics tool for the same with examples. 15

Or

(*a*) How does JMOL facilitate interpretation of protein structures. 8

(*b*) Describe the features and advantages of PyMOL. 7

P.T.O.

3. Can you elaborate on different types of methods utilized in secondary structure prediction. 15

Or

(*a*) Describe the role of consensus methods in combining predictions from multiple algorithms for enhanced accuracy in secondary structure prediction. 8

(*b*) Explain the significance of secondary structure prediction in context of function. 7

4. Elaborate on homology modeling method for tertiary structure prediction. 15

Or

(*a*) Discuss the role of MSA in protein structure prediction. 8

(*b*) Discuss about neural network based methods for protein structure prediction. 7

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

(*a*) GOR IV

(*b*) Ramchandran maps

(*c*) Tortion angles

(*d*) Secondary structure elements

(*e*) Peptide formation.

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.

<div align="center">

Or

(किंवा)

</div>

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

　　पर्यावरण अभ्यासाचे महत्त्व विशद करा.

(*b*)　Describe grassland ecosystem.　　　　　　　　　　　7

　　'गवताळ परिसंस्था' विशद करा.

<div align="right">

P.T.O.

</div>

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.