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NH—05—2023

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2023

(New Course)

BIOINFORMATICS

(Basics of Immunology)

(Thursday, 30-11-2023) **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three Hours *Maximum Marks*—75

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

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

1. Write a note on structure and functions of Antibodies. 15

Or

(*a*) Discuss innate immunity. 8

(*b*) Explain infection. 7

2. Write a note on organs of immune system. 15

Or

(*a*) Explain in detail Hematopoiesis. 8

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

3. Explain in detail concept of graft rejection. 15

P.T.O.

Or

(*a*) Discuss Humoral immune response. 8

(*b*) Write a note on MHC complex. 7

4. Write a note on primary immunodeficiency. 15

Or

(*a*) Discuss autoimmunity. 8

(*b*) Explain secondary immunodeficiency with AIDS. 7

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

(*a*) B-cells

(*b*) Antigen

(*c*) Complement fixation

(*d*) Agglutination reaction

(*e*) ELISA.

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NH—10—2023

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2023

(New Pattern)

BIOINFORMATICS

Paper-CCBI-2E

(Computational Structural Biology)

(Saturday, 2-12-2023) **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. What is database ? Explain in detail molecular structure databases with example. 15

Or

(*a*) What is PDB ? Describe how to retrieve the structure of macromolecule with steps. 8

(*b*) Describe in detail structural data and explain any database. 7

P.T.O.

2. Explain in detail protein structure levels with example and add a note on topology of protein. 15

Or

(*a*) What is visualization ? Explain any two protein visualization tool with example. 8

(*b*) Enlist molecular visualization tool and write about any *three* visualization tool with steps. 7

3. Describe in detail secondary structure of protein and write about how to predict this structure. 15

Or

(*a*) Explain in detail any *three* methods to analyze tertiary structure of protein. 8

(*b*) Write down different methods of analyze classes of proteins. 7

4. Describe in detail prediction of tertiary structure of protein with suitable database. 15

Or

(*a*) Explain in detail fold recognition methods with example. 8

(*b*) What is homology modeling ? Describe in detail SWISS-MODEL with example. 7

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

(*a*) Chime

(*b*) PDB

(*c*) Visualization tool

(*d*) WHATIF

(*e*) Genthreader.

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NH—16—2023

FACULTY OF SCIENCE

B.Sc. (Fifth Semester) EXAMINATION

NOVEMBER/DECEMBER, 2023

(New Course)

BIOINFORMATICS

Paper-CCBI-IE

(Genetic Engineering)

(Tuesday, 5-12-2023) **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 neat and well labelled diagrams if necessary.

1. Write a note on methods of gene transfer. 15

Or

(*a*) Describe λ phage as cloning tool. 8

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

2. Describe in detail Sangers DNA sequencing. 15

Or

(*a*) Discuss PCR mechanism and applications. 8

(*b*) Write a note on Northern blotting. 7

P.T.O.

3. Describe in detail genomic library and its applications. 15

Or

(*a*) Write a note on probe based method of screening of library. 8

(*b*) Discuss autoradiography of DNA. 7

4. Discuss various applications of *r*-DNA technology in pharmaceuticals. 15

Or

(*a*) Write a note on BT-cotton. 8

(*b*) Discuss protein engineering. 7

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

(*a*) Chemical synthesis of DNA

(*b*) Markers

(*c*) pBR-322

(*d*) Automated DNA sequencing.

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NH—27—2023

FACULTY OF SCIENCE

B.Sc. (Fifth Semester) EXAMINATION

NOVEMBER/DECEMBER, 2023

(New Pattern)

BIOINFORMATICS

(Programming in Java)

(Friday, 8-12-2023) **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*) Write programs wherever necessary.

1. Write in detail about control statements in Java. 15

Or

(*a*) Describe in detail features of Java. 8

(*b*) Write about memory allocation using new operator in Java. 7

2. Write in detail about inheritance and its types. 15

Or

(*a*) Write about constructor overloading in Java. 8

(*b*) What is use of finalize( ) method in Java ? 7

P.T.O.

3. Write about stream classes and byte stream classes in Java. 15

Or

(*a*) Describe exceptional handling using throws keyword. 8

(*b*) Describe about abstract class in Java. 7

4. Describe about graphical user interface using applet. 15

Or

(*a*) Describe about repaint( ) method in detail. 8

(*b*) Write about passing parameters to applet. 7

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

(*a*) Creation of files

(*b*) Subclass

(*c*) Datatypes in Java

(*d*) Finally block

(*e*) Garbage collection.