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PH—05—2024

FACULTY OF SCIENCE

B.Sc. (Fourth Semester) EXAMINATION

MARCH/APRIL, 2024

(New Course)

BIOINFORMATICS

(Basics of Immunology)

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

Time—Three Hours *Maximum Marks*—75

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

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

1. Describe in detail innate and acquired immunity. 15

Or

(*a*) Explain in detail complement fixation. 8

(*b*) Write a note on Antibodies : Antibody – structure and function. 7

2. Describe in detail structure and function of Bone marrow and the Thymus. 15

Or

(*a*) Describe in detail lymph nodes. 8

(*b*) Write a note on structure and functions of microphage and nature killer cell. 7

P.T.O.

3. Describe in detail concept of Graft rejection. 15

Or

(*a*) Write a note on Cellular Immune Response. 8

(*b*) Explain in detail MHC complex. 7

4. Explain in detail autoimmunity with examples. 15

Or

(*a*) Write a note on secondary immunodeficiency. 8

(*b*) Describe in detail primary immunodeficiency. 7

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

(*a*) B-cell

(*b*) Stem cell

(*c*) History of immune system

(*d*) Infection

(*e*) Antigen.

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

PH—25—2024

FACULTY OF SCIENCE

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

MARCH/APRIL, 2024

(New Pattern)

BIOINFORMATICS

(Biochemical Techniques)

(Friday, 12-04-2024) **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three Hours *Maximum Marks*—75

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

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

1. Write in detail about principle, theory, image formation of electron microscope. 15

Or

(*a*) What is spectra ? Describe in detail its types. 8

(*b*) Describe in detail law of absorption and ultraviolet spectroscopy. 7

P.T.O.

2. Write in detail about Thin layer chromatography. 15

Or

(*a*) Describe adsorption chromatography. 8

(*b*) Write in detail about paper chromatography. 7

3. Explain basic principle, type of centrifugation. 15

Or

(*a*) Write in detail about centripetal force and centrifugal force. 8

(*b*) Describe application of centrifuge. 7

4. How to separate a biomolecule ? Describe with any *one* method. 15

Or

(*a*) Write in detail about isoelectric focusing technique. 8

(*b*) Describe field gel electrophoresis. 7

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

(*a*) Types of rotor

(*b*) Light microscopy

(*c*) PAGE

(*d*) Nature of density gradient

(*e*) Column chromatography.

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PH—11—2024

FACULTY OF SCIENCE

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

MARCH/APRIL, 2024

(New Course)

BIOINFORMATICS

Paper CCBI-2D

(Database Management System)

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

Time—Three Hours *Maximum Marks*—75

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

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

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

1. Explain oracle function in detail. 15

Or

(*a*) Explain group by query. 8

(*b*) Explain advantages of store function. 7

2. Explain table computation in detail. 15

Or

(*a*) Explain concept of domain types. 8

(*b*) Create table and injecting value in the table and make it one column default. 7

P.T.O.

3. Explain PL/SQL in detail. 15

Or

(*a*) Explain primary key with example. 8

(*b*) Compare and differentiate between store procedure and store function. 7

4. Explain Codd's rule in detail. 15

Or

(*a*) Write a note on unique data constraints with example. 8

(*b*) What is cursor ? Describe in brief. 7

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

(*a*) Alter the table name (write query)

(*b*) Write a query for (letter) in upper case

(*c*) Current table

(*d*) Dual table

(*e*) PL/SQL block.

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PH—26—2024

FACULTY OF SCIENCE

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

MARCH/APRIL, 2024

(New Pattern)

BIOINFORMATICS

(Immunoinformatics)

(Friday, 12-04-2024) **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 wherever necessary.

1. Write in detail about antibody mediated immunity. 15

Or

(*a*) Describe about MHC-MHC database. 8

(*b*) Give an account on T-cell. 7

2. Describe in detail about Peptide-MHC binding. 15

Or

(*a*) Write in detail about IEDB analysis resource. 8

(*b*) What are epitopes ? Describe about epitope production using bioinformatics. 7

P.T.O.

3. Describe in detail about reverse vaccinology. 15

Or

(*a*) Give an account on generations of vaccines. 8

(*b*) Compare reverse vaccinology with traditional vaccinology. 7

4. Describe in detail about tools for vaccine design. 15

Or

(*c*) Write in detail about B-cells. 8

(*d*) Give an account on prediction of proteosome processing. 7

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

(*a*) Immunology and Bioinformatics

(*b*) Computational vaccinology

(*c*) CTL Pred

(*d*) Prediction of MHCII epitopes

(*e*) Servers for vaccine design.

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PH—17—2024

FACULTY OF SCIENCE

B.Sc. (Fourth Semester) EXAMINATION

MARCH/APRIL, 2024

(New Pattern)

BIOINFORMATICS

(Programming in Perl)

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

Time—Three Hours *Maximum Marks*—75

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

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

(*iii*) Write programs wherever necessary.

1. Write about programming language concept and programming process. 15

Or

(*a*) Write in detail about text editors used in Perl. 8

(*b*) Write about string in Perl with proper example. 7

2. Write in detail about list and arrays in Perl. 15

Or

(*a*) Describe in detail about file handling in Perl. 8

(*b*) Describe in detail about installation of Perl. 7

P.T.O.

3. Write in detail about looping statements with proper examples. 15

Or

(*a*) What are hashes ? Describe with the help of program. 8

(*b*) Write about passing data to subroutines. 7

4. Describe in detail about standard amino acid codes. 15

Or

(*a*) Give an account on transcription. 8

(*b*) Describe in brief about BioPerl. 7

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

(*a*) Python

(*b*) Next statement

(*c*) Variables in Perl

(*d*) Running Perl program

(*e*) FASTA format.