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VH—05—2024

FACULTY OF SCIENCE

B.Sc. (Fourth Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

(New Course)

BIOINFORMATICS

Paper-CCBI-1D

(Basics of Immunology)

(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.

1.　Describe in detail innate and acquired immunity.　　　　15

Or

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

(*b*)　Write a note on antigen-antibody reaction.　　　　7

2.　Describe in detail Organs of immune system.　　　　15

Or

(*a*)　Describe in detail Hematopoiesis process.　　　　8

(*b*)　Write a note on structure and functions of T-cell.　　　　7

P.T.O.

3. Describe in detail MHC I & II complex. 15

Or

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

(*b*) Explain in detail Concept of Graft Rejection. 7

4. Explain in detail secondary immunodeficiency with examples. 15

Or

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

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

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

(*a*) B-cell

(*b*) Microphage

(*c*) Antibodies

(*d*) Infection

(*e*) Antigen.

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VH—25—2024

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2024

(New Pattern)

BIOINFORMATICS

Paper DSEBI-40

(Biochemical Techniques)

(Wednesday, 4-12-2024)   **Time : 2.00 p.m. to 5.00 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. Describe in detail principle, working and application of compound microscope.   15

Or

(a) Write a short note on electromagnetic spectrum.   8

(b) Explain in detail SEM.   7

2. Explain in detail principle, working and application of Ion exchange chromatography.   15

Or

(a) Write a note on paper chromatography.   8

(b) Explain in detail partition chromatography.   7

P.T.O.

3. Describe in detail density gradient centrifugation. 15

Or

(*a*) Write a note on types of Rotor. 8

(*b*) Explain centriperal and centrifugal force. 7

4. Describe in detail principle, working and application of polyacrylamide gel electrophoresis. 15

Or

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

(*b*) Pulse field gel electrophoresis. 7

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

(*a*) Visible spectroscopy

(*b*) Adsorption chromatography

(*c*) Sedimentation

(*d*) Principle of electrophoresis

(*e*) Types of centrifuge.

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VH—11—2024

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2024

(New Course)

BIOINFORMATICS

CCBI-2D

(Database Management System)

(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) *All* questions carry equal marks.

(iii) Draw well labelled diagrams wherever necessary.

1. What is database ? Explain Codd's 12 rule with example.   15

Or

(a) Write the query of create, insert, view and rename the table.   8

(b) Explain DDL and DML commands with example.   7

2. What is data constraints ? Explain different constraints with example. 15

Or

(a) Describe in detail oracle functions.   8

(b) Write the query of alter command on table with examples.   7

P.T.O.

3. Explain in detail PL/SQL block with example. 15

Or

(*a*) Write the query of joining two table with example. 8

(*b*) What is cursor ? Explain its types with examples. 7

4. Explain in detail how oracle engine execute procedure and function. 15

Or

(*a*) Describe in detail syntax and example of creating procedure and function.

8

(*b*) Describe in detail oracle datatype with example. 7

5. Write short notes on : 15

(*a*) Create table and insert 10 values in table

(*b*) Viewing table

(*c*) Tuple

(*d*) Procedure and functions

(*e*) DDL command

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VH—26—2024

FACULTY OF SCIENCE

B.Sc. (Fourth Semester) EXAMINATION

NOVEMBER/DECEMBER, 2024

(New Pattern)

BIOINFORMATICS

(Immunoinformatics)

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

Time—Three Hours   *Maximum Marks—75*

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

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

1.   Define immunoinformatics. Explain the connection between Immunology and Bioinformatics.   15

Or

(a)   Explain antibody mediated immunity.   8

(b)   Define epitope. Explain its types.   7

2.   Describe in detail description of peptide MHC-binding.   15

Or

(a)   Define MHC-complex. Explain MHC-I–MCH-II epitopes.   8

(b)   Explain CTLPred database.   7

P.T.O.

3. Explain in detail IEDB analysis resource. 15

Or

(*a*) How is the proteasome processing done ? 8

(*b*) How to select the epitope ? Explain criterias. 7

4. Explain in detail computational vaccinology concept. 15

Or

(*a*) What is Traditional Vaccinology ? 8

(*b*) What is Reverse Vaccinology ? 7

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

(*a*) AntiBP database

(*b*) Humoral immunity

(*c*) Vaccine construct

(*d*) Meningococcus vaccine

(*e*) T-cell epitope.

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VH—17—2024

FACULTY OF SCIENCE

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

NOVEMBER/DECEMBER, 2024

(New Pattern)

BIOINFORMATICS

Paper CCBI-3D

(Programming in Perl)

(Monday, 2-12-2024)   **Time : 2.00 p.m. to 5.00 p.m.**

Time—Three Hours   *Maximum Marks—75*

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

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

   (*iii*)   Solve questions with examples.

1.   What is Perl ? How to install Perl programming language ? Explain its benefits.   15

Or

(*a*)   Write in detail about benefits of Perl.   8

(*b*)   Write a program for concatenating DNA fragments.   7

2.   What is Pattern Matching ? Explain pattern matching operator and anchoring the pattern.   15

Or

(*a*)   Write a program to calculate reverse complement.   8

(*b*)   What is array ? Explain in detail array library function with example.   7

P.T.O.

3. Explain in detail subroutine and write a program for passing parameter to subroutine. 15

Or

(*a*) Write a program for passing data to subroutines. 8

(*b*) Write a program for 'for each' statement. 7

4. What is sequence file format ? Explain in detail any 10 file formats with example. 15

Or

(*a*) Write a program for translating DNA into proteins. 8

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

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

(*a*) Array

(*b*) Genetic code

(*c*) If statement

(*d*) Operator

(*e*) Pattern matching.