





- 6) The PAM matrices were introduced by \_\_\_\_\_
- a) Margaret Dayhoff                      b) Feng and Doolittle  
c) Henikoff and Henikoff              d) None of these
- 7) Each amino acid corresponds to a \_\_\_\_\_ turn in an alpha helix.
- a) 120°                      b) 100°                      c) 85°                      d) None of these
- B) Definitions : 7
- 1) Synteny  
2) Phylip  
3) BankIt  
4) Taxonomy  
5) HMM  
6) SAM  
7) Comparative genomics.

## PART – II

Answer **any four** of the following :

2. Explain in detail sequence pattern and profile analysis and add a note on Gribskov method. 14
3. What are scoring matrices and give a detailed derivation of PAM and BLOSSUM matrices ? 14
4. Describe in detail identification of secondary structure elements from the knowledge structure. 14
5. Explain protein arrays, its basic principles and applications. 14
6. Answer **any two** from the following : 14
- a) Identification of SNPs from SNP database.  
b) Explain the Mega blast algorithm and add a note of BLAST2.  
c) Use of HMM based algorithm for MSA.
7. Write short notes on **(any two)** : 14
- a) MEGA  
b) EXPASY  
c) MUMmer.
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**M.Sc. (Part – I) (Semester – II) Examination, 2014  
(CGPA Pattern)  
BIOINFORMATICS  
Paper – II : Microbiology and Biotechnology (New)**

Day and Date : Thursday, 24-4-2014  
Time : 11.00 a.m. to 2.00 p.m.

Total Marks : 70

- Instructions:** 1) *Part – I, question 1 is compulsory.*  
2) *Attempt **any four** questions from Part – II.*  
3) *Figures to the **right** indicate **full** marks.*  
4) *Answers to the Part – I and Part – II are to be written in **same** answer booklet only.*

PART – I

1. A) Rewrite the sentence after choosing the correct answer from the given alternatives :

7

- 1) \_\_\_\_\_ belongs to three domains of life.
  - a) Archaea
  - b) Bacteria
  - c) Eukarya
  - d) All of these
- 2) A \_\_\_\_\_ bacterium is devoid of cell wall.
  - a) *E. coli*
  - b) Mycoplasma
  - c) Mycobacterium
  - d) None of these
- 3) Molecular taxonomy is based on \_\_\_\_\_.
  - a) 28S rRNA
  - b) 16S rRNA
  - c) 30S rRNA
  - d) None of these
- 4) In \_\_\_\_\_ process the genetic material is transferred from donor to recipient cell by virus.
  - a) Transformation
  - b) Transduction
  - c) Conjugation
  - d) None of these
- 5) The concept of totipotency was proposed by \_\_\_\_\_.
  - a) Haberlandt
  - b) Skoog
  - c) Cocking
  - d) Miller

P.T.O.





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**M.Sc. (Part – I) (Semester – II) Examination, 2014  
BIOINFORMATICS**

**Paper – III : Basic Biochemistry and Immunology (New) (CGPA Pattern)**

Day and Date : Saturday, 26-4-2014

Total Marks : 70

Time : 11.00 a.m. to 2.00 p.m.

- Instructions :** 1) *Part I, Question 1 is compulsory.*  
2) *Attempt **any four** questions from Part II.*  
3) *Figures to the **right** indicate **full** marks.*  
4) *Answers to the Part I and Part II are to be written in **same answer booklet only.***

PART – I

1. A) Rewrite the sentence after choosing the correct answer from the given alternatives.

7

- 1) The major source of energy for a living cell is  
A) Carbon      B) Nitrogen      C) Oxygen      D) Hydrogen
- 2) Enzymes belong to the class of \_\_\_\_\_ proteins.  
A) Regulatory      B) Signal      C) Structural      D) All
- 3) The basic components of lipids are  
A) amino acids      B) vitamins  
C) fatty acids      D) glucose
- 4) Agarose is an example of  
A) Polysaccharide      B) Monosaccharide  
C) Oligosaccharide      D) None
- 5) B cells are derived from \_\_\_\_\_ lineage.  
A) Erythroid      B) Myeloid      C) Osteoid      D) Leucoid





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**M.Sc. (Part – I) (Semester – II) Examination, 2014  
BIOINFORMATICS (New)  
Paper – IV : Programming in Object Oriented Languages  
(CGPA Pattern)**

Day and Date : Tuesday, 29-4-2014  
Time : 11.00 a.m. to 2.00 p.m.

Total. Marks : 70

- Instructions :** 1) Part – I, Question 1 is **compulsory**.  
2) Attempt **any four** questions from Part – II.  
3) Figures to the **right** indicate **full** marks.  
4) Answers to the Part – I and Part – II are to be written in **same answer Booklet only**.

PART – I

1. A) Rewrite the sentence after choosing the correct answer from the given alternatives.

7

- 1) The highest priority of a method can be  
a) 10                      b) 100                      c) 5                      d) 1
- 2) The exception class is in \_\_\_\_\_ package.  
a) java.file              b) java.io              c) java.lang              d) java.util
- 3) Which keyword is used to monitor statement for exception ?  
a) try                      b) catch                      c) throws                      d) none of these
- 4) The priority of a thread can be got by \_\_\_\_\_ method.  
a) prority()                      b) getPriority()  
c) setPriority()                      d) threadPriority()
- 5) A package is a collection of  
a) Classes                      b) Interfaces  
c) Editing tools                      d) None of these













- 5) IUCN publishes \_\_\_\_\_ of organisms.
- a) Genetic names                      b) Generic names  
c) Gene class                              d) None of these
- 6) Coca-cola is a well known example of \_\_\_\_\_
- a) trade secret                              b) trade mark  
c) patent                                      d) copyright
- 7) WIPO stands for
- a) Wide Intellectual Provisional Office  
b) World Intelligence Protection Organization  
c) World Internal Property Organization  
d) World Intellectual Property Organization
- 8) The farmers act was formulated in the year \_\_\_\_\_
- a) 1951                                      b) 1999  
c) 2001                                      d) 2005
- 9) \_\_\_\_\_ can be protected for unlimited period of time.
- a) Trade secret                              b) Patents  
c) Trade mark                              d) None of the above
- 10) Hibbred patent is associated with \_\_\_\_\_ patent.
- a) Micro-organism                              b) Animal  
c) Plant                                      d) Molecule

B) Answer the following :

10

- 1) Product patent
- 2) Phylogeny
- 3) TRIPS
- 4) BGBM
- 5) Patent ethics.



PART – II

Answer **any four** of the following :

2. Write an essay on 'Biological patents'. 20
  3. Give a detail account on molecular systematics. 20
  4. Explain in brief principles of taxonomy. Write a separate note on phylogeny in biodiversity informatics. 20
  5. Write short answers of **any two** from the following : 20
    - 1) GBIF
    - 2) Patent procedure
    - 3) Copyrights.
  6. Write short notes on **any four** of the following : 20
    - 1) Diamond Vs Chakraborty case
    - 2) Geographical indications
    - 3) Gene patent
    - 4) Types of phylogenetic trees
    - 5) Biodiversity data availability
    - 6) Biodiversity informatics projects of the world.
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**M.Sc. (Part – II) (Semester – IV) Examination, 2014**  
**BIOINFORMATICS**  
**Advanced Molecular Biology (Paper – III)**

Day and Date : Saturday, 26-4-2014  
Time : 3.00 p.m. to 6.00 p.m.

Total Marks : 100

- Instructions :** 1) Part – I, question 1 is **compulsory**.  
2) Attempt **any four** questions from Part – II.  
3) Figures to the **right** indicate **full** marks.  
4) Answers to the Part – I and Part – II are to be written in **same answer book only**.

PART – I

1. A) Choose the correct answer from given alternatives : **10**
- I) The thermostable form of DNA polymerase used in PCR cycles is \_\_\_\_\_  
a) Paq                      b) Baq                      c) Taq                      d) Maq
- II) \_\_\_\_\_ blotting technique involves transfer of RNA molecules onto membranes for the detection of specific sequences by hybridization.  
a) Northern blotting                      b) Southern blotting  
c) Western blotting                      d) South Western blotting
- III) Relative expression levels of thousands of genes can be visualized using \_\_\_\_\_ technology.  
a) Autoradiography                      b) DNA fingerprinting  
c) RFLP                      d) Microarray
- IV) \_\_\_\_\_ technology uses radioactive probes to identify bands derived from hyper variable regions of DNA.  
a) DNA finger printing                      b) DNA foot printing  
c) Colony hybridization                      d) In-situ hybridization
- V) One of the application of site-directed mutagenesis is \_\_\_\_\_  
a) Microarray                      b) Microinjection  
c) Protein engineering                      d) Gel matching



- VI) \_\_\_\_\_ method is used as a chemical method for protein sequencing.
- a) Immunohistochemical
  - b) Edman degradation
  - c) Di-deoxysangers
  - d) Maxam and Gilbert
- VII) Two-dimensional polyacrylamide gel electrophoresis (2-D -PAGE) is a method used to separate proteins according to \_\_\_\_\_
- a) Centrifugal force
  - b) Mass
  - c) Charge
  - d) Charge and mass
- VIII) The most commonly used general protein stain for detecting proteins on gels is \_\_\_\_\_
- a) Ethidium Bromide
  - b) Methylene Blue
  - c) Coomassie Brilliant Blue
  - d) Alcian Blue
- IX) \_\_\_\_\_ chromatography method is used to separate a protein that binds strongly to its substrate.
- a) Gel filtration
  - b) Cation exchange
  - c) Anion exchange
  - d) Affinity
- X) A commonly employed first separation step in protein isolation is \_\_\_\_\_
- a) Ammonium sulfate precipitation
  - b) Gel filtration chromatography
  - c) Ion-exchange chromatography
  - d) Electrophoresis
- B) Answer the following :
- a) Taq polymerase
  - b) Probes
  - c) Expasy
  - d) Ampholytes
  - e) Dialysis.



PART – II

Answer **any four** of the following :

2. Discuss the principles, methodology and applications of PCR. **20**
  3. Discuss the isolation and purification of proteins using chromatographic methods. **20**
  4. What are probes ? Elaborate principle, methodology and applications of Southern blotting. **20**
  5. Write short answer (**any two**) : **20**
    - a) Compare SDS-PAGE and Native-PAGE.
    - b) Colony hybridization and its application in screening of recombinants
    - c) Write note on DNA fingerprinting.
  6. Write short notes on (**any four**) : **20**
    - a) Site directed mutagenesis
    - b) RFLP
    - c) 2-D PAGE
    - d) HPLC
    - e) Autoradiography
    - f) Edman degradation.
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**M.Sc. (Part – II) (Semester – IV) Examination, 2014**  
**BIOINFORMATICS (Paper – IV)**  
**Emerging Areas of Bioinformatics**

Day and Date : Tuesday, 29-4-2014  
Time : 3.00 p.m. to 6.00 p.m.

Total Marks : 100

- Instructions :**
- 1) *Part I, Question 1 is compulsory.*
  - 2) *Attempt **any four** from Part II.*
  - 3) *Figures to the **right** indicate marks.*
  - 4) *Answers to the Part I and Part II should be written in the **same** answer book.*

PART – I

1. A) Choose the correct answer from the alternative and rewrite the sentence : **10**
- 1) SMILES refer to
    - a) System Mutation Immune Lineage Entry Specification
    - b) Simplified Molecular Input Line Entry Specification
    - c) Simple Mutation Invivo Line Entry Specification
    - d) System Mutation Immune Line Entry Specification
  - 2) \_\_\_\_\_ protocols include WMS and WFS.
    - a) Open Geographic consortium
    - b) Open Geospatial Consortium
    - c) Both a and b
    - d) Office of Groove City
  - 3) Chloramphenicol is an example of
    - a) Soft drug
    - b) Hard drug
    - c) Prodrug
    - d) Shot drug
  - 4) ADME includes all except
    - a) absorption
    - b) distribution
    - c) metabolism
    - d) circulation
  - 5) \_\_\_\_\_ coined the term nanotechnology.
    - a) Harper
    - b) Bob Holmes
    - c) Richard Feynman
    - d) Willknight



- 6) QSAR stands for
- a) Qualitative Structure Activity Relation
  - b) Quantum Structure Active Relation
  - c) Quantitative Structure Activity Relationship
  - d) Quality Size Active Relation
- 7) HLA/IMGT database is present in
- a) NCBI
  - b) EMBL
  - c) DNAS
  - d) DDBJ
- 8) Methods and tools used in cheminformatics include
- a) Genbank
  - b) QSAR
  - c) CML
  - d) Both b and c
- 9) Cytochrome p450 is involved in
- a) Drug metabolism
  - b) Respiration
  - c) Digestion
  - d) Circulation
- 10) \_\_\_\_\_ is the immenomic database.
- a) IMGT
  - b) IPD
  - c) IRIS
  - d) All of the above

B) Answer the following :

10

- 1) Peptide repertoire
- 2) GOLD database
- 3) Nano filters
- 4) LIDAR
- 5) High throughout sequencing

## PART – II

Answer **any four** of the following :

- 2. Give a detailed explanation on future of computational modeling and prediction systems in clinical immunology. **20**
- 3. What is chemoinformatics ? Explain the use of chemoinformatics. **20**
- 4. Discuss the various genome sequencing projects and their implications. **20**



5. Write short answers of **any two** from the following : **20**
- a) Drug Bank
  - b) GIS
  - c) Nanoparticles
6. Write short notes on **any four** from the following : **20**
- a) Immunome databases
  - b) Bee Base
  - c) Peptide repertoire
  - d) Pharmacogenomics
  - e) Personalized medicine
  - f) Bioinformatics
-

