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**M.Sc. (Part – I) (Semester – II) (New CBCS) Examination, 2016**  
**BIOINFORMATICS**  
**Paper – V : Advanced Bioinformatics**

Day and Date : Wednesday, 30-3-2016  
Time : 10.30 a.m. to 1.00 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) \_\_\_\_\_ is a tool in EMBOSS which gives protein statistics.  
a) Showfeat  
b) Infoseq  
c) Pepstat  
d) None of these
- 2) ORF stands for \_\_\_\_\_  
a) Old Reader Field  
b) Open Reading Frame  
c) Open Reading Flank  
d) None of these
- 3) COG stands for \_\_\_\_\_  
a) Cluster Ontology Groups  
b) Cluster Omics Groups  
c) Cluster Orthologous Groups  
d) Cluster Origin Genome





PART – II

Answer **any four** of the following :

2. What is pairwise sequence alignment ? Give a detailed description of Smith-Waterman algorithm. **14**
  3. Explain molecular taxonomy and phylogeny in details and add note on maximum parsimony and maximum likelihood methods. **14**
  4. Explain different types identification of SNPs methods and add a detailed account on SNP database. **14**
  5. Answer **any two** from the following : **14**
    - a) Explain basic principle of protein arrays and its applications.
    - b) Write a note on KEGG database.
    - c) Explain MUMmer and suffix tree, add a note on comparative genomics.
  6. Write short notes on (**any two**) : **14**
    - a) PAM Matrices.
    - b) MEGA.
    - c) CLUSTAL W.
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**M.Sc. (Part – I) (Semester – II) (New CBCS) Examination, 2016**  
**BIOINFORMATICS**  
**Paper No. – VI : Microbiology and Biotechnology**

Day and Date : Friday, 1-4-2016

Total Marks : 70

Time : 10.30 a.m. to 1.00 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) Choose the correct answer from the given alternatives. 7
- 1) Peptidoglycan layer is absent in
    - a) Bacteria
    - b) Archae bacteria
    - c) Both a and b
    - d) None of these
  - 2) \_\_\_\_\_ classified viruses based on genetic material.
    - a) Robert Koch
    - b) David Baltimore
    - c) Louis Pasteur
    - d) None of these
  - 3) \_\_\_\_\_ is not a cloning vector.
    - a) Cosmid
    - b) pBR322
    - c) pUC18
    - d) TMV
  - 4) Five kingdom classification was given by
    - a) Whittaker
    - b) Carl Woese
    - c) Louis Pasteur
    - d) None
  - 5) \_\_\_\_\_ bacteria having smallest genome.
    - a) *E. coli*
    - b) *Mycoplasma*
    - c) *Rickettsiae*
    - d) *Bacillus subtilis*
  - 6) Electroporation is a \_\_\_\_\_ method of gene transfer.
    - a) Physical
    - b) Biological
    - c) Chemical
    - d) All of these
  - 7) Differentiation of callus is called
    - a) Morphogenesis
    - b) Dedifferentiation
    - c) Shooting
    - d) Rooting

P.T.O.



- B) Definition : 7
- 1) YACs
  - 2) Endospore
  - 3) Competent cell
  - 4) amp<sup>R</sup>
  - 5) SCP
  - 6) Microinjection
  - 7) T4 Bacteriophage.

PART – II

Answer **any four** of the following.

2. Explain Agrobacterium mediated gene transfer in plant. 14
  3. Explain different methods of staining techniques. 14
  4. Explain viral classification. Add a note on plant and animal viruses. 14
  5. Write short answers of **any two** from the following : 14
    - a) Write a note on HIV.
    - b) Write a note on aseptic techniques in plant tissue culture.
    - c) Write a note on pBR322.
  6. Short notes **any two** of the following. 14
    - a) Pure culture techniques
    - b) Eubacteria and Archae bacteria
    - c) Gene therapy.
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**M.Sc. (Part – I) (Semester – II) (New CBCS) Examination, 2016**  
**BIOINFORMATICS**  
**Paper No. – VII : Basic Biochemistry and Immunology**

Day and Date : Monday, 4-4-2016

Total Marks : 70

Time : 10.30 a.m. to 1.00 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 name protein was suggested by  
A) Kuhne                      B) Leninger      C) Watson                      D) Brezelius
- 2) Standard free energy is denoted by  
A)  $\Delta E^\circ$                       B)  $\Delta G^\circ$                       C)  $\Delta H^\circ$                       D)  $\Delta F^\circ$
- 3) Amino acids possessing both the charges are called  
A) divalent ions                      B) zwitter ions  
C) dipole ions                      D) none
- 4) \_\_\_\_\_ is a structural polysaccharide.  
A) Starch                      B) Cellulose  
C) Glycogen                      D) Sucrose
- 5) B cells are derived from \_\_\_\_\_ lineage.  
A) Erythroid                      B) Myeloid  
C) Osteoid                      D) Leucoid



6) \_\_\_\_\_ is a secondary lymphoid organ.

- A) Bursa of Fabricious      B) Lymph node  
C) Thymus                      D) None

7) Antibodies are produced by differentiated

- A) B cells      B) T cells      C) NK cells      D) None

B) Definitions :

7

- 1) Enzyme
- 2) Glycosidic bond
- 3) Vitamin D
- 4) IgM
- 5) Phagocyte
- 6) Cytokine
- 7) CMI.

## PART – II

Answer **any four** of the following :

2. Explain the structural classification of proteins. 14
3. Explain different types of antigen antibody interactions. 14
4. Write a detailed note on innate immunity. 14
5. Answer **any two** from the following : 14
  - a) Write a note on functions of carbohydrates.
  - b) Add a note on secondary metabolites.
  - c) Explain different types of nucleic acids.
6. Write short notes on (**any two**) : 14
  - a) Classification of lipids.
  - b) Hypersensitivity.
  - c) Autoimmunity.

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**M.Sc. (Part – I) (Semester – II) (New CBCS) Examination, 2016**  
**BIOINFORMATICS**  
**Paper – VIII : Programming in Object Oriented Languages**

Day and Date : Wednesday, 6-4-2016

Total Marks : 70

Time : 10.30 a.m. to 1.00 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) What is the range of data type short in Java ?
  - a) – 128 to 127
  - b) – 32768 to 32767
  - c) – 2147483648 to 2147483647
  - d) None of the mentioned
- 2) Which of these cannot be used for a variable name in Java ?
  - a) Identifier
  - b) Keyword
  - c) Identifier and keyword
  - d) None of the mentioned
- 3) Which of the following loops will execute the body of loop even when condition controlling the loop is initially false ?
  - a) do-while
  - b) while
  - c) for
  - d) none of the mentioned
- 4) Which of these keywords is used to make a class ?
  - a) class
  - b) struct
  - c) int
  - d) none of the mentioned
- 5) Which of these functions is called to display the output of an Applet ?
  - a) display()
  - b) print()
  - c) displayApplet()
  - d) printApplet()

P.T.O.





- 6) Which of these classes is used to make a thread ?  
a) String            b) System            c) Thread            d) Runnable
- 7) PERL stands for \_\_\_\_\_  
a) Practical Extraction Report Language  
b) Preparation Extraction Report Language  
c) Practical Extraction Review Language  
d) None of these

## B) Definitions :

7

- 1) Interface
- 2) Vectors
- 3) Exception
- 4) Thread
- 5) Applet
- 6) Class
- 7) Lists in Perl.

## PART – II

Answer **any four** of the following :

2. Explain features of java in details. 14
  3. What is applet in java and explain life cycle of applet with example. 14
  4. Explain array and list data in Perl with example. 14
  5. Answer **any two** from the following : 14
    - a) Design a simple login page using applet in java.
    - b) Write a Perl script to display three letter and one letter amino acid code.
    - c) Explain exception handling in java.
  6. Write short notes on (**any two**) : 14
    - a) Thread methods.
    - b) Data types in Java.
    - c) Perl in bioinformatics.
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**M.Sc. (Part – II) (Semester – IV) (CGPA) Examination, 2016**  
**BIOINFORMATICS**  
**Biological Simulation and Modeling (Paper – I)**

Day and Date : Wednesday, 30-3-2016  
Time : 2.30 p.m. to 5.00 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) \_\_\_\_\_ you create a variable “a” that is equal to 2.  
a) var a = 2      b) int a = 2      c) a = 2      d) variable a = 2
  - 2) In Python, \_\_\_\_\_ is one function to output content to the console.  
a) print()      b) echo()      c) msg()      d) none of these
  - 3) Python is \_\_\_\_\_ types of language.  
a) dynamic      b) semi-dynamic  
c) static      d) none of these
  - 4) What symbol can you use to comment out one line of code ?  
a) #      b) \$      c) //      d) none of these
  - 5) \_\_\_\_\_ is one of the class of simulation.  
a) Energy      b) Clock      c) Both a and b      d) None
  - 6) \_\_\_\_\_ is one of the biological model of simulation.  
a) Epidemic model      b) Population model  
c) Chemical model      d) All
  - 7) AutoDock is an example of \_\_\_\_\_  
a) MD      b) MC      c) Both a and b      d) None



B) Definitions :

7

- 1) Open()
- 2) Module
- 3) Function
- 4) Program
- 5) Simulation
- 6) Action
- 7) REST

## PART – II

Answer **any four** of the following.

2. Define simulation. Add a note on principles and applications. **14**
  3. Explain string functions in Python with example. **14**
  4. Add a note on molecular dynamics with examples. **14**
  5. Explain iterators in Python with example. **14**
  6. Answer **any two** from the following. **14**
    - 1) Write a note on epidemic model.
    - 2) Explain working with file with examples.
    - 3) Add a note on molecular mechanics with reference to biological molecules.
  7. Write short notes on **(any two)** : **14**
    - a) Python editor.
    - b) Functions in Python.
    - c) Molecular modeling.
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**M.Sc. (Part – II) (Semester – IV) (CGPA) Examination, 2016  
BIOINFORMATICS  
Paper No. – II : Biodiversity Informatics and IPR**

Day and Date : Friday, 1-4-2016  
Time : 2.30 p.m. to 5.00 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) \_\_\_\_\_ is a space-based satellite navigation system that provides location and time information in all weather, anywhere on or near the Earth.  
a) GIS                      b) GPS                      c) GBIF                      d) All of these
- 2) GOOS stands for \_\_\_\_\_  
a) Global Observing Ocean System  
b) Geographic Ocean Open System  
c) Global Ocean Observing System  
d) None of these
- 3) A character can be \_\_\_\_\_ when nucleotide changes are shared by two or more taxa.  
a) Phylogenetically informative                      b) Phylogenetically uninformative  
c) Both a) and b)                      d) None of these
- 4) \_\_\_\_\_ was the First National Park established in India.  
a) Jim Corbett National Park                      b) Gir National Park  
c) Kaziranga National Park                      d) None of these
- 5) Patent office present in India \_\_\_\_\_  
a) Mumbai                      b) Chennai                      c) Kolkata                      d) All

P.T.O.



- 6) \_\_\_\_\_ biological material is granted patent in India.
- a) Basumati rice    b) Turmeric  
 c) Both a) and b)     d) None
- 7) \_\_\_\_\_ of the following cannot be protected by copyright.
- a) Musical compositions                                        b) Computer software and hardware  
 c) Graphic works    d) Folklore

## B) Definitions :

7

- 1) TDWG
- 2) BRIT
- 3) Landscape diversity
- 4) GIS
- 5) Genetic diversity
- 6) Copyright
- 7) Trade Mark.

## PART – II

Answer **any four** of the following :

2. Explain the different standards and protocols of biodiversity informatics. Give an account on data management in biodiversity informatics and add a note on GBIF. 14
  3. What is IPR ? Give a detailed account on types of intellectual property right. 14
  4. Give a detailed account on Molecular systematics. 14
  5. What is patent ? Write a note on criteria and procedure for patenting. 14
  6. Answer **any two** of the following : 14
    - 1) Explain the analysis of Gene diversity in subdivided populations.
    - 2) Write a note on copyright.
    - 3) Explain geographical inductions.
  7. Short notes (**any two**) : 14
    - 1) VPLANT database
    - 2) PBR
    - 3) Hotspots of Biodiversity.
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**M.Sc. (Part – II) (Semester – IV) (CGPA) Examination, 2016**  
**BIOINFORMATICS**  
**Paper No. – III : Advanced Molecular Biology**

Day and Date : Monday, 4-4-2016  
Time : 2.30 p.m. to 5.00 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) Southwestern Blotting is used for
  - a) DNA
  - b) DNA binding protein
  - c) RNA
  - d) Both (a) and (b)
- 2) \_\_\_\_\_ tool is used to analyse peptide mass fingerprint.
  - a) Mass spectroscopy
  - b) MASCOT
  - c) ExPassy
  - d) All
- 3) DNA fingerprint is used to detect
  - a) Paternity
  - b) Crime samples
  - c) Genetic test
  - d) All
- 4) cDNA is prepared from
  - a) rRNA
  - b) mRNA
  - c) rRNA
  - d) snRNA
- 5) \_\_\_\_\_ technique is used to separate proteins based on size and charge.
  - a) SDS PAGE
  - b) Native PAGE
  - c) IEF
  - d) 2D PAGE
- 6) \_\_\_\_\_ technique used to identify specific DNA sequence in bacterial colonies.
  - a) In situ hybridization
  - b) Colony hybridization
  - c) Dot blot technique
  - d) None
- 7) \_\_\_\_\_ tool is used to design primers.
  - a) Primer 3
  - b) Oligo 4
  - c) Clustal W
  - d) Both (a) and (b)

P.T.O.



B) Answer the following :

7

- 1) GSP primers
- 2) VNTR
- 3) Radioactive isotope
- 4) Ultra filtration
- 5) Plaque hybridization
- 6) SDM
- 7) MASCOT.

## PART – II

Answer **any four** of the following :

2. Explain the construction and screening gene fragments from cDNA library. **14**
  3. Explain in detail the protein purification techniques. **14**
  4. Explain RFLP and AFLP techniques with their applications. **14**
  5. Analysis of protein sequences using ExPasy Tools. **14**
  6. Answer **any two** of the following : **14**
    - a) Explain random amplification of polymorphic DNA.
    - b) Write a note on HPLC with neat labelled diagram.
    - c) Describe single nucleotide polymorphism.
  7. Short notes (**any two**) : **14**
    - 1) DNA probe
    - 2) Colony hybridization
    - 3) GLC.
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**M.Sc. (Part – II) (Semester – IV) (CGPA) Examination, 2016**  
**BIOINFORMATICS**  
**(Paper – IV) Emerging Areas of Bioinformatics**

Day and Date : Wednesday, 6-4-2016  
Time : 2.30 p.m. to 5.00 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) \_\_\_\_\_ is a discipline of using computational techniques to assist in the discovery and design of drugs.
- a) Molecular modeling                      b) CADD  
c) Computational chemistry              d) None of these
- 2) Methods and tools used in cheminformatics include \_\_\_\_\_
- a) Genbank                                      b) QSAR  
c) CML    d) Both b) and c)
- 3) \_\_\_\_\_ is the immunomic database.
- a) IMGT    b) IPD  
c) IRIS    d) All of these
- 4) GOLD stands for \_\_\_\_\_
- a) Global Initiative for Chronic Obstructive Lung Disease  
b) Genomes Obstructive Database  
c) Genomes Online Database  
d) Genomes Online Library Dictionary





- 5) SMILES refer to \_\_\_\_\_
- a) Systematic mutation immunosuppressive lineage entry specification
  - b) Simplified Molecular input line entry specification
  - c) Simple mutation in vivo line entry specification
  - d) None of these
- 6) VIPR stands for \_\_\_\_\_
- a) Viral Pathogen Resource
  - b) Vega Plant Resource
  - c) Virus Pathogen Resource
  - d) None of these
- 7) Nanoparticles are used in \_\_\_\_\_
- a) Biofuels
  - b) Artificial retina
  - c) Drug delivery
  - d) All of these

B) Definitions :

7

- 1) HTS
- 2) Immunoinformatics
- 3) XYZ file format
- 4) NMR
- 5) Pathology informatics
- 6) Gold nanoparticles
- 7) Ensemble.

PART – II

Answer **any four** of the following :

- 2. Explain in detail human genome project and add a note on shotgun sequencing. **14**
- 3. Give a detailed account on Pathogen genome databases. **14**



4. Enlist the different databases for chemical structure search and chemical structure representation. 14
  5. Give a detailed account on different mechanical process for synthesis of nanoparticles. 14
  6. Answer **any two** of the following : 14
    - 1) MDL Mol file format.
    - 2) Nanoparticles in health care.
    - 3) Describe in detail scanning electron microscope.
  7. Short notes (**Any two**) : 14
    - 1) EuPathDB
    - 2) Openbabel
    - 3) Nanotechnology.
-