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**M.Sc. Bioinformatics (Part – I) (Semester – I) Examination, 2015**  
**Paper – I : BASIC BIOINFORMATICS (New – CBCS)**

Day and Date : Monday, 16-11-2015

Total Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

- Instructions :** 1) *Part – I, Question No. 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 protein secondary database is  
a) MMDB                      b) PROSITE                      c) NRL-3D                      d) All of these
  - 2) The word size in BLAST for the protein is  
a) 5                              b) 6                              c) 3                              d) None of these
  - 3) The DNA Databank of Japan is maintained by  
a) NRL-3D                      b) NIG                              c) EBI                              d) SIB
  - 4) FTP stands for  
a) Form Transferring Page                      b) File Transfer Protocol  
c) File Transfer Practice                      d) Field Transfer Protocol
  - 5) ASN stands for  
a) Abstract Syntax Notation                      b) Able String Notation  
c) Able Syntax Notation                      d) Alignment Syntax Notation
  - 6) \_\_\_\_\_ is the organismal, tissue or cell level measurements of molecular dynamic changes over time.  
a) Interactomics                      b) Fluxomics  
c) Metabolomics                      d) Biomics
  - 7) \_\_\_\_\_ program compares a protein query against the all six reading frames of a nucleotide sequence database.  
a) Blastp                      b) Tblastn                      c) Tblastx                      d) All of these

P.T.O.



- B) Definitions : 7
- 1) SRS
  - 2) PIR
  - 3) Sequin
  - 4) Fingerprints
  - 5) Neural Network
  - 6) Ktup
  - 7) Blastp.

PART – II

Answer **any four** of the following :

2. Give a detailed account on protein databases and add a note on applications of bioinformatics. 14
  3. Explain Neural Networks and add a note on Support Vector Machines. 14
  4. Explain the brief description of various file formats for biomolecular sequences like Genbank, GCG, FASTA, IG and plain format. 14
  5. Answer **any two** from the following : 14
    - a) Explain the algorithm of FASTA tool.
    - b) Explain Clustal W, Rasmol and its analysis methods.
    - c) Write a note on Human Genome Project.
  6. Write short notes on (**any two**) : 14
    - a) Treeview
    - b) BLAST and types of BLAST
    - c) BLOSUM.
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**M.Sc. (Semester – I) (Part-I) Examination, 2015  
Paper – II : Cell Biology and Genetics (New-CBCS)  
BIOINFORMATICS**

Day and Date : Wednesday, 18-11-2015  
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 not the stop codon.
  - a) GUG                                  b) UAG
  - c) UGG                                  d) UAA
- 2) Ribose sugar is found in
  - a) DNA                                  b) RNA
  - c) Protein                              d) None of these
- 3) Introns are found in
  - a) Eukaryotic                          b) Prokaryotic
  - c) Both a & b                          d) None of these
- 4) DNA polymerase requires \_\_\_\_\_ components for replication.
  - a) primer                              b) dNTPs
  - c) Taq DNA polymerase          d) All of these
- 5) \_\_\_\_\_ is involved in cell respiration.
  - a) ribosome                            b) mitochondria
  - c) nucleus                              d) lysosome





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**M.Sc. (Part – I) (Semester – I) (CBCS) Examination, 2015  
BIOINFORMATICS  
Paper – III : Introduction to HTML and Biostatistics (New)**

Day and Date : Friday, 20-11-2015  
Time : 10.30 a.m. to 1.00 p.m.

Max. 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**.*

SECTION – I

1. A) Multiple Choice Questions :

7

- 1) What does HTTP stand for
  - a) HTML Text Transfer Protocol
  - b) Hyper Text Transfer Protocol
  - c) High Transfer Tier Program
  - d) HTML Type Transfer Protocol
- 2) <Marquee> tag has following attribute
  - a) Action
  - b) Start
  - c) Direction
  - d) Size
- 3) First page of website is called
  - a) Webpage
  - b) Homepage
  - c) Front page
  - d) Website
- 4) URL stands for
  - a) Uniform Resource Locator
  - b) Uniform Reset Locator
  - c) Unique Resource Locator
  - d) Uniform Resource Local
- 5) The number of occurrences of data value is called
  - a) Class limits
  - b) Frequency
  - c) Cumulative frequency
  - d) Relative frequency



- 6) The most frequently occurring value in the data set is called  
 a) Spread                      b) Mode                      c) Skewness                      d) Median
- 7) Statistical results are  
 a) Absolutely correct                      b) Not true  
 c) True on average                      d) Universally true
- B) Define the following terms : 7
- 1) Internet
  - 2) LAN
  - 3) Webpage
  - 4) Search engine
  - 5) Class width
  - 6) Negative correlations
  - 7) Range.

## SECTION – II

2. Explain the structure of HTML program. Explain any 12 tags with examples. 14
3. Calculate median and mode for the following data. 14

<b>Class</b>	0-10	10-20	20-30	30-40	40-50	50-60
<b>Frequency</b>	40	25	50	35	30	20

4. Calculate mean deviation and its coefficient for the following data. 14

<b>Class</b>	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
<b>Frequency</b>	30	58	62	85	112	70	57	26

5. Answer **any two** of the following. 14
- a) What is Hyperlink ? How are they created with example ?
  - b) Advantages of HTML.
  - c) Applications of biostatistics.
6. Write short notes on **any two** of the following : 14
- a) Features of HTML.
  - b) Create a web page to demonstrate font variations.
  - c) Cumulative frequency curve (Ogive).



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**M.Sc. (Part – I) (Semester – I) Examination, 2015  
BIOINFORMATICS (CBCS)**

**Paper – IV : Introduction to Programming Languages and Programming  
Through C and C++ (New)**

Day and Date : Monday, 23-11-2015

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.

PART – I

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

7

- 1) C is commonly called as \_\_\_\_\_ language.
  - a) OOP
  - b) POP
  - c) Functional programming
  - d) None of these
- 2) \_\_\_\_\_ pair is used for single character I/O.
  - a) getchar( ) and putchar( )
  - b) input( ) and output( )
  - c) scanf( ) and printf( )
  - d) None of these
- 3) \_\_\_\_\_ is a special type of a variable which stores address of another variable.
  - a) Structure
  - b) Pointer
  - c) Array
  - d) String
- 4) C++ is an object-oriented programming language created by
  - a) Denis Richie
  - b) Bjarne Stroustrup
  - c) Pearson
  - d) Mark Zuckerberg



- 5) By default, all members of a class have \_\_\_\_\_ access for all its members.  
 a) Public                      b) Private                      c) Protected                      d) No access
- 6) Which of the following is NOT a key component of object oriented programming ?  
 a) Inheritance    b) Encapsulation  
 c) Polymorphism    d) Parallelism
- 7) Which of the following operators below allow defining the member functions of a class outside the class ?  
 a) : ?                      b) ?                      c) ::                      d) %
- B) Definitions : **7**
- 1) Global variable
  - 2) Logical operator
  - 3) Syntax error
  - 4) Pointer
  - 5) Class
  - 6) Encapsulation
  - 7) Scope resolution operator.

## PART – II

Answer **any four** of the following :

2. Explain in brief structure of C programming with example. **14**
  3. What is an array ? Explain the types of arrays in C with examples. **14**
  4. Describe inheritance with its types in C++. **14**
  5. Answer **any two** from the following : **14**
    - a) Add a note on pointers in C.
    - b) Write a C program to check whether the given year is Leap Year or Not.
    - c) Write a note on C++ constructors and destructors.
  6. Write short notes on (**any two**) : **14**
    - a) Break, continue and goto statements in C
    - b) Looping in C++
    - c) File handling in C++.
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**M.Sc. Bioinformatics (Part – II) (Semester – III) Examination, 2015  
(CGPA Pattern)**

**Paper – I : BIOLOGICAL DATABASE MANAGEMENT SYSTEM**

Day and Date : Monday, 16-11-2015

Max. Marks : 70

Time : 2.30 p.m. to 5.00 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) Workers behind the scene of DBMS are
  - a) DBMS system designers
  - b) Tool developers
  - c) Operators
  - d) All of these
- 2) UOD stands for
  - a) Universal value of Data
  - b) Universe of Discourse
  - c) Both a) and b)
  - d) All of these
- 3) \_\_\_\_\_ are designed and programmed for naïve users as interfaces to canned transactions.
  - a) Graphical User Interfaces
  - b) Forms-Based Interfaces
  - c) Menu-Based Interfaces
  - d) None of these
- 4) \_\_\_\_\_ is used to combine related tuples from two relations into single tuples.
  - a) Project Operation
  - b) Join Operation
  - c) Union Operation
  - d) None of these
- 5) BCNF stands for
  - a) Broad Code Normal Form
  - b) Boyce-Codd-Normal Form
  - c) Basic Code Normal Form
  - d) All of these

P.T.O.



- 6) DBAs are responsible for \_\_\_\_\_ data resources.
- a) Achieving
  - b) Administering
  - c) Designing
  - d) None of these
- 7) A \_\_\_\_\_ constraint enables a unique identification of each record in a table.
- a) Primary Key
  - b) Foreign Key
  - c) Check Constraints
  - d) None of these

B) Definitions :

7

- 1) Schema
- 2) Database designers
- 3) Standalone end users
- 4) Foreign key
- 5) Tuple
- 6) ERD
- 7) Table.

PART – II

Answer **any four** of the following :

2. Write a note on DBMS languages using high level conceptual data models for database designs and explain in brief the DBMS interfaces. **14**
3. Give an account on Data models, Categories, Schemas, Instances, Database. State and write three schema architecture. **14**
4. Create a Biological database by defining constraints like primary key, foreign key. **14**
5. Explain all DML queries with example. **14**
6. Answer **any two** : **14**
- a) Characteristics of DBMS and workers behind scene.
  - b) Explain the clustering and classification methods of data mining.
  - c) Describe SQL statements in details.
7. Write short notes on (**any two**) : **14**
- a) Attributes and its types
  - b) RDBMS with its characteristics
  - c) Dr. E.F. Codd's rules.
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**M.Sc. Bioinformatics (Part – II) (Semester – III) Examination, 2015**  
**Paper – II : ADVANCED BIOPHYSICAL TECHNIQUES (CGPA Pattern)**

Day and Date : Wednesday, 18-11-2015  
Time : 2.30 p.m. to 5.00 p.m.

Max. 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 sentences after choosing the correct answer from the given alternatives. 7
- 1) The strongest electromagnetic force is found in
    - a) Ionic bond
    - b) Hydrogen bond
    - c) Covalent bond
    - d) None
  - 2) Electromagnetic spectrum is a characteristic feature of
    - a) Wavelength
    - b) Energy
    - c) Frequency
    - d) None
  - 3) CD in biophysical chemistry stands for
    - a) Centre Dichroism
    - b) Central Dipole
    - c) Circular Dichroism
    - d) Compact Disc
  - 4) In X-ray crystallography, molecules are in \_\_\_\_\_ state.
    - a) Solid
    - b) Liquid
    - c) Gaseous
    - d) All
  - 5) \_\_\_\_\_ particles are used in SEM.
    - a) Electrons
    - b) Protons
    - c) Neutrons
    - d) All
  - 6) NMR is used to study
    - a) Molecular structure
    - b) Molecular weight
    - c) Molecular interaction
    - d) None
  - 7) The wavelength of X-rays is
    - a) 200-400 nm
    - b) 10-0.01 nm
    - c) 700-2500 nm
    - d) None



- B) Definitions : 7
- 1) Electron density
  - 2) Polarized light
  - 3) Quartz Cuvette
  - 4) Crystallography
  - 5) TEM
  - 6) NIR
  - 7) Refractive Index.

## PART – II

Answer **any four** of the following :

2. Write a detailed note on electromagnetic spectrum and its mode of molecular interactions. 14
  3. With a neat diagram explain the instrumentation of SEM and mention its applications. 14
  4. Write a note on theory and instrumentation of visible spectroscopy. 14
  5. Add a note on principle and applications of CD and ORD. 14
  6. Answer **any two** : 14
    - a) Explain the principle of NMR.
    - b) Add a note on applications of X-ray crystallography.
    - c) Explain the types of ionization for mass spectroscopy.
  7. Write short notes on **any two** of the following : 14
    - 1) Non-covalent interactions
    - 2) Crystal
    - 3) Confocal microscopy.
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**M.Sc. (Bioinformatics) (Part – II) (Semester – III) Examination, 2015  
COMPUTATIONAL STRUCTURE BIOLOGY AND DRUG DESIGNING  
(CGPA Pattern) (Paper – III)**

Day and Date : Friday, 20-11-2015  
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 loop modeling software.  
a) CODA  
b) PETRA  
c) Both a) and b)  
d) SWCRL
- 2) The pairwise energy method was originally called as \_\_\_\_\_.  
a) Homology modeling  
b) Threading  
c) Fold recognition  
d) None of these
- 3) CSA stands for \_\_\_\_\_.  
a) Critical Sequence Assess  
b) Catalytic Site Atlas  
c) Catalytic Site Assembler  
d) None of these
- 4) The \_\_\_\_\_ program mainly use the profile/HMM method extensively for sequence pattern construction.  
a) CDART  
b) Prodom  
c) Both a) and b)  
d) None of these
- 5) Lectins are \_\_\_\_\_.  
a) Carbohydrate binding domains  
b) Protein binding domains  
c) DNA binding domains  
d) Lipid binding domains

P.T.O.



- 6) Major site of drug metabolism is \_\_\_\_\_  
a) Lung                      b) Liver                      c) Kidney                      d) All of these
- 7) Pharmacokinetics involves \_\_\_\_\_  
a) Absorption              b) Distribution              c) Metabolism              d) All of these
- B) Definitions : 7
- 1) Regular expression
  - 2) FSSP
  - 3) Molecular Chaperons
  - 4) Pharmacodynamics
  - 5) Chemoinformatics
  - 6) High through put docking
  - 7) Mutation in drug target.

## PART – II

Answer **any four** of the following :

2. Explain Threading and Fold recognition. 14
  3. What is secondary structure prediction and explain statistical methods of secondary structure prediction ? 14
  4. What is docking ? Explain docking process using Hex 4.0. 14
  5. What is drug design ? Explain drug designing parameters using ACD Lab. 14
  6. Answer **any two** from the following : 14
    - a) Explain the identification of motifs and domains.
    - b) Give an account on SCOP database.
    - c) Write a note on protein-protein interaction databases.
  7. Write short notes on (**any two**) : 14
    - a) PDBeMotif
    - b) KEGG database
    - c) Drug Bank.
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**M.Sc. (Part – II) (Semester – III) Examination, 2015  
(CGPA Pattern)  
BIOINFORMATICS**

**IV : Research Methodology in Bioinformatics**

Day and Date : Monday, 23-11-2015

Max. Marks : 70

Time : 2.30 p.m. to 5.00 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) A research aims at finding a solution to an immediate problem arising in society is  
a) Fundamental      b) Applied      c) Descriptive      d) Historical
- 2) Characteristics of research is  
a) Inter-disciplinary team approach  
b) Objectivistic approach  
c) Economical in nature  
d) All of these
- 3) Sampling theory helps us to estimate \_\_\_\_\_ population.  
a) Unknown      b) Known      c) Particular      d) Universal
- 4) The abstract of manuscript should be of about \_\_\_\_\_ words.  
a) 50      b) 75      c) 250      d) 450



- 5) \_\_\_\_\_ is not a method of data collection.
- a) Questionnaires
  - b) Interviews
  - c) Experiments
  - d) Observations
- 6) \_\_\_\_\_ is not one of the seven major parts to the research report.
- a) Results
  - b) Abstract
  - c) Method
  - d) Footnotes
- 7) In research, something that does not vary is called
- a) Variables
  - b) Methods
  - c) Constant
  - d) Control group

## B) Definitions :

7

- 1) Pure research.
- 2) Sampling size.
- 3) Research design.
- 4) Exploratory research.
- 5) Hypothesis.
- 6) Correlation
- 7) Chi square test.

## PART – II

Answer **any four** of the following :

- 2. What is research ? Explain in detail the types of research. **14**
- 3. Explain in detail the characteristics of research. **14**
- 4. What is sampling theory ? Explain in detail the types of sampling. **14**
- 5. Give the different guidelines for writing Results and Discussion in the preparation of manuscript. **14**
- 6. Answer **any two** from the following : **14**
  - a) Write a note on criteria for selecting research problem.
  - b) Write a note on importance and meaning of research.
  - c) Explain data collection methods.
- 7. Write short notes on (**any two**) : **14**
  - a) ANOVA.
  - b) Review of literature.
  - c) Research report.

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