

Seat No.	
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Set **P**

**M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2017**  
**Bioinformatics**  
**BASIC BIOINFORMATICS**

Day & Date: Thursday, 16-11-2017  
 Time: 10.30 AM to 01.00 PM

Max. Marks: 70

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

**Section - I**

**Q.1 A) Rewrite the sentence after choosing the correct answer from the given alternatives: 07**

- 1) \_\_\_\_\_ program compares a protein query against the all six reading frames of a nucleotide sequences database.
  - a) Blastp
  - b) tblastx
  - c) tblastn
  - d) all of these
- 2) OMIM stand for \_\_\_\_\_.
  - a) Ontology Mechanism In Man
  - b) Online Machine Interface mapping
  - c) Online Machine inheritance in Man
  - d) Online Mendelian Inheritance in Man
- 3) GUI stands for \_\_\_\_\_.
  - a) Graphical User Interface
  - b) Genic User Interphase
  - c) Genome User Interface
  - d) None of these
- 4) SVM stands for \_\_\_\_\_.
  - a) Species Vector Machine
  - b) Support Vector Machine
  - c) System Vector Machine
  - d) None of these
- 5) The protein secondary database is \_\_\_\_\_.
  - a) NCBI
  - b) GenBank
  - c) NRL-3D
  - d) Pfam
- 6) FTP stands for \_\_\_\_\_.
  - a) Form Transferring Page
  - b) File Transfer Practice
  - c) File Transfer Protocol
  - d) Field Transfer Protocol
- 7) NBRF it stands for \_\_\_\_\_.
  - a) National Biomedical Research Foundation
  - b) Nation Biological Research Fund
  - c) National Biomedical Research Fund
  - d) Nation Biological Research Foundation

**B) Definitions.**

- 1) Sequence similarity
- 2) BLASTn
- 3) Phylip
- 4) Enterz
- 5) PIR
- 6) Neural Network
- 7) SVM

**Section - II**

**Answer any four of the following.**

- Q2** Explain Neural Networks and add a note o Support Vector Machine. **14**
- Q3** Give the detailed account on NCBI and explain the nucleotide sequence database in details. **14**
- Q4** What is String Matching Algorithm and add a note on BLAST and FASTA sequence comparison. **14**
- Q5** **Answer any two of the following.** **14**
- a) Explain the Gene array analysis and its applications.
  - b) Give an account on Entrez and SRS tools.
  - c) Explain ClustalW and TreeView in details.
- Q6** **Write short note any two of the following.** **14**
- a) GenBank File Format
  - b) PIR
  - c) Applications of Bioinformatics.

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**M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2017  
Bioinformatics  
CELL BIOLOGY AND GENETICS**

Day & Date: Saturday, 18-11-2017  
Time: 10.30 AM to 01.00 PM

Max. Marks: 70

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

**Section - I**

**Q.1 A) Rewrite the sentence after choosing the correct answer from the given alternatives: 07**

- 1) The dihybrid test cross ratio is \_\_\_\_\_.
  - a) 9:3:2:1
  - b) 9:3:3:1
  - c) 9:3:2:2
  - d) 9:1:1:1
- 2) Each gametes carry \_\_\_\_\_.
  - a) Only recessive allele
  - b) Only dominant allele
  - c) Only one of the allele
  - d) All of these
- 3) Poly A tail is a characteristics of \_\_\_\_\_ mRNA.
  - a) Prokaryotic
  - b) Eukaryotic
  - c) Both a & b
  - d) None of these
- 4) E site, P site and A site are found on \_\_\_\_\_.
  - a) rRNA
  - b) mRNA
  - c) tRNA
  - d) hnRNA
- 5) \_\_\_\_\_ is involved in cell respiration.
  - a) Ribosome
  - b) Mitochondria
  - c) Nucleus
  - d) lysosome
- 6) Cell growth takes place in \_\_\_\_\_ phase.
  - a) M
  - b) S
  - c) G2
  - d) All of these
- 7) \_\_\_\_\_ is a secondary messenger.
  - a) Hormone
  - b) Acetylcholine
  - c) Cyclic AMP
  - d) None

**B) Definitions 07**

- 1) Point mutation
- 2) Ligase
- 3) Transcriptomics
- 4) Lysosome
- 5) Autotroph
- 6) GPCR
- 7) Monocistronic

**Section - II****Answer any four of the following**

- Q2** Explain the process of DNA replication in prokaryote with diagram. **14**
- Q3** What is operon? Explain the mechanism of lac operon concept **14**
- Q4** Write a note on various cell organelles. **14**
- Q5** **Answer any two of the following** **14**
- a) Explain the process of transcription in eukaryotes.
  - b) Write a note on DNA repair mechanism.
  - c) Add a note on regulation of cell cycle.
- Q6** **Answer any two of the following** **14**
- a) Post translational modifications.
  - b) Receptors and carriers of cell.
  - c) Signal transduction.

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**M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2017  
Bioinformatics**

**INTRODUCTION TO HTML & BIOSTATISTICS**

Day & Date: Tuesday, 21-11-2017  
Time: 10.30 AM to 01.00 PM

Max. Marks: 70

- Instructions:** 1) Section-1 is compulsory.  
2) Attempt any four questions from Section - II.  
3) All Questions carry equal marks.  
3) Figures to the right indicate full marks.  
4) Draw neat and labeled diagram.

**Section - I**

**Q.1 A) Complete the sentences by selecting correct answer from the given alternatives: 07**

- 1) A \_\_\_\_\_ tag is used to display the image.
 

a) picture	b) image
c) img	d) src
- 2) \_\_\_\_\_ tag inserts a line horizontally on your web page.
 

a) <hr>	b) <line>
c) <line direction ="horizontal">	d) <tr>
- 3) Tags and test that are not directly displayed on the page are written in \_\_\_\_\_ section.
 

a) <html>	b) <head>
c) <title>	d) <body>
- 4) \_\_\_\_\_ connects web pages.
 

a) Connector	b) Line
c) Hyperlink	d) None of the above
- 5) The first page of a website is called \_\_\_\_\_.
 

a) Design Page	b) Home page
c) First page	d) Main page
- 6) The number of occurrences of data value is called \_\_\_\_\_.
 

a) Class limits	b) Frequency
c) Cumulative frequency	d) Relative frequency
- 7) The most frequently occurring value in the data set is called \_\_\_\_\_.
 

a) Spread	b) Mode
c) Skewness	d) Median

**B) Definitions**

**07**

- 1) Anchor
- 2) WWW
- 3) Hyperlink
- 4) Head tag
- 5) Sample space
- 6) Cumulative frequency
- 7) Class mark

## Section - II

- Q2** Explain briefly advantages and disadvantages of World Wide Web (WWW). **14**
- Q3** Explain in detail HTML History. **14**
- Q4** Find the correlation co-efficient between X and Y from the following data:- **14**

X	17	18	19	19	20	20	21	21	22	23
Y	12	16	14	11	15	19	22	16	15	20

- Q5** Answer any two of the following **14**
- a) Explain basic tags with attributes and example.
- b) Explain Frame tag attributes with example.
- c) Find the mode from the following data.

<b>Marks</b>	0-10	10-20	20-30	30-40	40-50	50-60
<b>No. of students</b>	3	8	15	20	10	4

- Q6** Answer any two of the following **14**
- a) Write a note on Ordered & Non-Ordered lists
- b) Merits and demerits of mean deviations.
- c) Explain Table tag attributes with example.

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**M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2017  
Bioinformatics**

**INTRODUCTION TO PROGRAMMING LANGUAGES & PROGRAMMING  
THROUGH C & C++**

Day & Date: Thursday, 23-11-2017  
Time: 10.30 AM to 01.00 PM

Max. Marks: 70

- Instructions:** 1) Part-1, Question 1 is compulsory  
2) Attempt any four questions from Part-II  
3) Figures to the right indicate full marks.  
4) All questions carry equal marks.  
5) Draw neat and labeled diagram.

**Section – I**

**Q.1 A) Complete the sentences by using correct answer the given alternatives:- 07**

- 1) To avoid return value in main function \_\_\_\_\_ keyword is used.
  - a) const
  - b) int
  - c) function
  - d) void
- 2) In a C expression, \_\_\_\_\_ is a logical AND represented.
  - a) @@
  - b) ||
  - c) AND
  - d) &&
- 3) String constants should be enclosed between \_\_\_\_\_.
  - a) Single Quotes
  - b) Both A and B
  - c) Double Quotes
  - d) None of these
- 4) To avoid return value in main function \_\_\_\_\_ keyword is used.
  - a) Const
  - b) int
  - c) function
  - d) void
- 5) The friend function in C++ is used to access \_\_\_\_\_ members of that class.
  - a) Public
  - b) Private
  - c) Protected
  - d) Virtual
- 6) OOPs stand for \_\_\_\_\_.
  - a) Oracle Oriented programming
  - b) Object Oriented programming
  - c) Operand Oriented programming
  - d) None of these
- 7) \_\_\_\_\_ is an operator which is used to access global variable inside the block.
  - a) ::
  - b) ++
  - c) +
  - d) >

**B) Definitions**

- 1) Variable
- 2) Algorithm
- 3) Keyword
- 4) Compiler
- 5) Object
- 6) Class
- 7) Pointer

**Section – II****Answer any four of the following**

- Q2** Difference between POP and OOP. **14**
- Q3** Write a C program for sum of 10 numbers along with algorithm & flowchart. **14**
- Q4** Describe concept of inheritance & types of inheritance with its example in C++ **14**
- Q5** **Answer any two of the following** **14**
- a) What is operator? Explain with examples different types of operator in C programming.
  - b) Briefly explain the structure of C Program.
  - c) Difference between entry controlled & exit controlled loops.
- Q6** **Short answer (Any two):-** **14**
- a) File handling in C programming.
  - b) Polymorphism
  - c) Write a C++ program larger of three numbers.



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Set **P**

**M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2017**  
**Bioinformatics**  
**PLANT BREEDING AND TISSUE CULTURE**

Day & Date: Thursday, 23-11-2017  
 Time: 10.30 AM to 01.00 PM

Max. Marks: 70

- Instructions:** 1) Part-1, Question 1 is compulsory  
 2) Attempt any four questions from Part-II  
 3) Figures to the right indicate full marks.  
 4) Draw neat and labeled diagram.  
 5) All questions carry equal marks.

**Section – I**

**Q.1 A) Rewrite the sentence after choosing the correct answer from the given alternatives: 07**

- 1) Synthetic seed is produced by encapsulating somatic embryo with \_\_\_\_\_.  
 a) Sodium alginate  
 b) Sodium nitrate  
 c) Sodium acetate  
 d) Sodium sulphate
- 2) The production of secondary metabolites requires the use of \_\_\_\_\_.  
 a) Protoplas  
 b) Cell suspension  
 c) Sodium acetate  
 d) Auxiliary bud
- 3) Shoot regeneration is promoted by \_\_\_\_\_.  
 a) NAA  
 b) 2, 4-D  
 c) BAP  
 d) IAA
- 4) A plant breeder wants to develop a disease resistant variety, what he should do first \_\_\_\_\_.  
 a) Mutation  
 b) Selection  
 c) Hybridization  
 d) Production of crop
- 5) Hybrids which are superior over parents are called \_\_\_\_\_.  
 a) Inbreeding  
 b) Dominant  
 c) Recessive  
 d) Heterosis
- 6) Major food crops have originated mainly from \_\_\_\_\_.  
 a) Ocean  
 b) Mountain  
 c) Desert  
 d) Plain
- 7) In micropropagation, virus free plants can be obtained through \_\_\_\_\_.  
 a) Shoot tip culture  
 b) Haploid culture  
 c) Protoplast culture  
 d) Embryo culture

**B) Definitions 07**

- 1) Ideotype breeding
- 2) MAS
- 3) Protoplast
- 4) Somaclonal
- 5) Cryopreservation
- 6) Secondary metabolites
- 7) Molecular pharming.

**Section – II****Answer any four of the following**

- Q2** Give a detailed account on breeding methods for self-pollinated, crosspollinated and clonally propagated. **14**
- Q3** Explain about genetic and physiological basis of abiotic stress tolerance. **14**
- Q4** Discuss in details plant regeneration pathways. **14**
- Q5** **Answer any two of the following** **14**
- a) Use of somaclonal and gametoclonal variation in crop improvement.
  - b) What is mutation? Explain in-vitro mutagenesis.
  - c) Principles and types of cryopreservation method.
- Q6** **Answer short notes any two of the following:-** **14**
- a) Biotransformation
  - b) Metabolic engineering for production of secondary metabolites.
  - c) Role of markers in stress resistance breeding.

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Set **P**

**M.Sc. (Semester - III) (New) (CBCS) Examination Oct/Nov-2017  
Bioinformatics**

**BIOLOGICAL DATABASE MANAGEMENT SYSTEM**

Day & Date: Thursday, 16-11-2017  
Time: 02.30 PM to 05.00 PM

Max. Marks: 70

- Instructions:** 1) Part-1, Question 1 is compulsory.  
2) Attempt any four questions from Part-II.  
3) Figures to the right indicate full marks.  
4) Draw neat and labeled diagram.  
5) All questions carry equal marks.

**PART – I**

**Q.1 A) Rewrite the sentence after choosing the correct answer from the given alternatives: 07**

- 1) \_\_\_\_\_ is a collection of recorded data.
  - a) Data
  - b) Software
  - c) Database
  - d) Scheme
- 2) Relational model was invented by \_\_\_\_\_.
  - a) Chris Date
  - b) Hugh Darwen
  - c) E. F. Codd
  - d) Bill Gates
- 3) \_\_\_\_\_ statement makes 'permanent' all changes performed in the current transaction.
  - a) Rollback
  - b) Truncate
  - c) Commit
  - d) None of these
- 4) DML is provided for \_\_\_\_\_.
  - a) Description of logical structure of database.
  - b) Manipulation & processing of database.
  - c) Addition of new structures in the database system.
  - d) Definition of physical structure of database system.
- 5) \_\_\_\_\_ combines the data manipulating power of SQL with the data processing power of Procedural languages.
  - a) PL/SQL
  - b) SQL
  - c) Advanced SQL
  - d) PQL
- 6) A \_\_\_\_\_ is a query that retrieves rows from more than one table or view:
  - a) Start
  - b) End
  - c) Join
  - d) All of the mentioned
- 7) \_\_\_\_\_ product is returned in a join query have no join condition:
  - a) Equijoins
  - b) Cartesian
  - c) Both
  - d) None of the mentioned

**B) Definitions.**

- 1) Table
- 2) Foreign Key.
- 3) Data Independence.
- 4) Cardinality.
- 5) Procedure.
- 6) Rollback
- 7) View.

**PART – II****Answer any four of the following.**

- |           |  |           |
|-----------|--|-----------|
| <b>Q2</b> | Explain Limitations of traditional file processing system & Advantages of DBMS?  | <b>14</b> |
| <b>Q3</b> | Explain Components of DBMS.  | <b>14</b> |
| <b>Q4</b> | Explain Data mining with Types of Data mining techniques and different types of application.                                 | <b>14</b> |
| <b>Q5</b> | <b>Answer any two of the following.</b><br>a) Users of DBMS.<br>b) ER Symbols.<br>c) Normalization.                          | <b>14</b> |
| <b>Q6</b> | <b>Answer any two of the following.</b><br>a) DML Commands.<br>b) Join Operations.<br>c) What is PL/SQL? Features of PL/SQL? | <b>14</b> |

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**M.Sc. (Semester - III) (New) (CBCS) Examination Oct/Nov-2017**  
**Bioinformatics**

**ADVANCED BIOPHYSICAL TECHNIQUES**

Day & Date: Saturday, 18-11-2017  
Time: 02.30 PM to 05.00 PM

Max. Marks: 70

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

**PART – I**

- Q.1 A) Rewrite the sentence after choosing the correct answer from the given alternatives: 07**
- 1) The wavelength Visible light is\_\_\_\_\_.
  - a) 200-780nm b) 2-180nm
  - c) 200-400nm d) None
  - 2) The type of IR which deals with vibrational energy is \_\_\_\_\_.
  - a) Near IR b) Mid-IR
  - c) Far IR d) All
  - 3) Non-metals are usually\_\_\_\_\_.
  - a) Electron donar b) Electron acceptor
  - c) Both a & b d) none
  - 4) In X-ray crystallography, molecules are in \_\_\_\_\_ state.
  - a) Solid b) Liquid
  - c) Gaseous d) All
  - 5) Radio waves are used as source in \_\_\_\_\_ spectroscopy.
  - a) UV b) Visible
  - c) IR d) NMR
  - 6) Population inversion is associated with\_\_\_\_\_.
  - a) Spectroscopy b) Laser
  - c) Crystallography d) ORD
  - 7) \_\_\_\_\_ invented the compound microscope.
  - a) Antony Van Leeuwenhoek's b) Louis Pasteur
  - c) Hans Janssen d) None

**B) Definitions. 07**

- 1) Electromagnetic wave
- 2) Atomic orbit.
- 3) Quartz Cuvette.
- 4) Optical activity.
- 5) MALDI.
- 6) Bragg's Law.
- 7) TEM.

## PART - II

**Answer any four of the following.**

- Q2** Add a note on instrumentation and applications of IR spectroscopy. **14**
- Q3** Define chemical bond. Explain different types of bonds. **14**
- Q4** Write a note on theory and instrumentation of UV spectroscopy. **14**
- Q5** **Answer any two of the following.** **14**
- a) Explain the principle of NMR.
  - b) Add a note on applications of CD and ORD.
  - c) Explain the types of ionization for mass spectroscopy.
- Q6** **Answer any two of the following.** **14**
- a) Principle of X-ray crystallography.
  - b) Applications of Laser. \
  - c) Microscope

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SLR-MC-77

**M.Sc. (Semester - III) (New) (CBCS) Examination Oct/Nov-2017  
Bioinformatics**

**COMPUTATIONAL STRUCTURE BIOLOGY AND DRUG DESIGNING**

Day & Date: Tuesday, 21-11-2017  
Time: 02.30 PM to 05.00 PM

Max. Marks: 70

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

**PART – I**

**Q.1 A) Rewrite the sentence after choosing the correct answer from the given alternatives: 07**

- 1) \_\_\_\_\_ is web based service for analysis, visualization and validation of NMR structure.  
a) NMR core  
b) NMRclust  
c) Vivaldi  
d) VASCO
- 2) Drug metabolism takes place in \_\_\_\_\_.  
a) Liver  
b) Kidney  
c) Brain  
d) All of these
- 3) MNT is \_\_\_\_\_.  
a) Protein database  
b) Pathway database  
c) Interaction database  
d) All of these
- 4) \_\_\_\_\_ display a schematic diagram of all interaction between DNA and Protein.  
a) Nuclpolt  
b) Thumbnail Image  
c) Wiring Diagram  
d) Ligplot
- 5) \_\_\_\_\_ is database of protein models generated by Modeller Program.  
a) ModBase  
b) 3D Crunch  
c) PDB  
d) PDBsum
- 6) \_\_\_\_\_ is drug designing tool.  
a) Keg draw  
b) ACD lab  
c) Chem. Sketch  
d) All of these
- 7) The 3D structure of Protein can be modeled by \_\_\_\_\_.  
a) PSI PRED  
b) Swiss Model  
c) GOR  
d) PHD

**B) Definitions**

- 1) Template.
- 2) Efficacy.
- 3) PDBeNMR.
- 4) Potency.
- 5) Jmol
- 6) QSPR.
- 7) Domain

**PART – II****Answer any four of the following**

- Q2** Explain in detail Protein-lipid and protein-DNA interaction with database and applications. **14**
- Q3** Explain in detail in *silico* drug discovery process and challenges. **14**
- Q4** Explain RNA structures prediction method and a note on molecular visualization software's. **14**
- Q5** **Answer any two of the following** **14**
- a) Write a note on QSAR and its applications.
  - b) Write a note on mutations in drug targets.
  - c) Write a note on structure visualization with tools.
- Q6** **Answer any two of the following** **14**
- a) CATCH and SCOP.
  - b) Drug absorption.
  - c) Protein Folding.



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**SLR-MC-78**

**M.Sc. (Semester - III) (New) (CBCS) Examination Oct/Nov-2017**  
**Bioinformatics**  
**MOLECULAR MEDICINE**

Day & Date: Tuesday, 21-11-2017  
Time: 02.30 PM to 05.00 PM

Max. Marks: 70

- Instructions:** 1) All questions of Section I are compulsory.  
2) Answer any four questions from section II  
3) All questions carry equal marks.  
4) Draw neat and labeled diagrams wherever necessary.

**SECTION – I**

**Q.1 A) Rewrite the sentence after choosing the correct answer from the given alternatives: 07**

- 1) Mutation in BTK gene leads to condition known as\_\_\_\_\_.  
a) Phenylketonuria                      b) Haemoglobinopathies  
c) Agammaglobulinemia              d) Marfan syndrome
- 2) \_\_\_\_\_ is defined as compound that demonstrates the desired biological activity on molecular target.  
a) Lead                                      b) Genome  
c) Mercury                                d) Iron
- 3) \_\_\_\_\_X linked recessive disease.  
a) DMD                                      b) CFTR  
c) BTK                                        d) Marfan
- 4) Stem cell exhibits \_\_\_\_\_ properties.  
a) Only potency                        b) Potency and self renewable  
c) Potency and non renewable      d) Only self-renewable
- 5) The human  $\alpha$ -globin gene of haemoglobin is located on chromosome number\_\_\_\_\_.  
a) 11                                        b) 12  
c) 16                                         d) 18
- 6) Hematopoietic stem cells are\_\_\_\_\_.  
a) Pluripotent                            b) Totipotent  
c) Unipotent                              d) Oligopotent
- 7) PAH gene is mutated in \_\_\_\_\_.  
a) Phenylketonuria                      b) Chagas disease  
c) Alzheimer's                          d) Cystic fibrosis

**B) Definitions 07**

- 1) Totipotency.
- 2) Recombination.
- 3) Microarray.
- 4) Lead optimization.
- 5) Magic bullets.
- 6) Down's syndrome.
- 7) Functional cloning.

**SECTION – II****Answer any four of the following**

- Q2** Define absorption. Explain in detail factor affecting absorption and add a note on pharmacogenetics. **14**
- Q3** Explain in detail viral and non viral methods of gene transfer. **14**
- Q4** Explain In brief properties, types and applications of adult stem cells. **14**
- Q5** **Answer any two of the following** **14**
- a) Give an account on phenylketonuria.
  - b) Explain in brief gammaglobulinemia.
  - c) Give an account on human genome project.
- Q6** **Answer any two of the following** **14**
- a) Chorionic villus sampling and its applications.
  - b) Blood and blood group antigens.
  - c) Parkinson's disease.