Seat No.

M.Sc. (Semester - I) (CBCS) Examination Oct/No-2019
Bioinformatics
BASIC BIOINFORMATICS

Day & Date: Monday, 18-11-2019   Max. Marks: 70
Time: 11:30 AM To 02:00 PM

Instructions: 1) All questions are compulsory.
              2) Figures to the right indicate full marks.

Q.1   **Fill in the blanks by choosing correct alternatives given below.**   **14**

1) In _____ training, both the inputs and the outputs are provided.
   a) Un supervised   b) Supervised
   c) Hybrid   d) Single

2) _____ is the branch of molecular biology concerned with the structure, function evolution, and mapping of genomes.
   a) Transcriptomics   b) Metabolomics
   c) Proteomics   d) Genomics

3) The good example of _____ is signal change of traffic lights in which the state of the current signal depends on the state of the previous signal.
   a) Neural network   b) ANN
   c) Markov model   d) support vector machine

4) The two sequences are descended from a common evolutionary origin, they are said to _____.
   a) Similarity   b) Identity
   c) Homology   d) paralogy

5) _____ it is a graphical way of comparing two sequences in-a two dimensional matrix.
   a) Dynamic programming   b) Heuristic algorithm
   c) Digonol line   d) Dot plot

6) The first step in _____ alignment is to identify ktups between two sequences by using the hashing strategy.
   a) clustal   b) FASTA
   c) BLAST   d) Rasmol

7) For both protein and DNA sequences, there may be regions that contain highly repetitive residues in sequence called as_____.
   a) Tandem repeats   b) unidirection repeats
   c) Low Complexity Regions   d) bidirectional repeats

8) _____ software package was originally developed by Roger Sayle in the early 90s.
   a) RasMol   b) Oligo
   c) Phylip   d) Paup

9) _____ immunopreciptation is methods DNA sequences bound to a particular protein can be isolated by immunoprecipitating that protein these fragments can be then hybridized to a microarray.
   - a) Zinc
   - b) Chromatin
   - c) Silver
   - d) Gold

10) Intelligenetics Sequence format molecular file format is started by molecular genetics group at _____ university.
   - a) Stanford
   - b) Genetics group
   - c) NCBI
   - d) EMBL

11) _____ is field of science in which biology, computer science and information technology merge into a single discipline.
   - a) Physics
   - b) Earth science
   - c) Bioinformatics
   - d) Enviournment

12) _____ database was established in 1984 by the National Biomedical Research Foundation (NBRF).
   - a) Pfam
   - b) Prosite
   - c) Emotif
   - d) PIR

13) _____ is an international scientific network and interest group that aims to enhance bioinformatics services by bringing together bioinformatics expertise's and capacities.
   - a) EMBnet
   - b) NBRF
   - c) PDB
   - d) MMDB

14) _____ algorithm it divides a data set so that records with similar content are in the same group, and groups are as different as possible from each other.
   - a) Classification
   - b) Clustering
   - c) Optimization
   - d) Data cleansing

Q.2 A) Attempt any four of the following question.   **08**
   1) Define tuple size in Fasta.
   2) What is internet and computer network?
   3) What is Proteomics in bioinformatics?
   4) What is hybridization technique in gene array?
   5) What is artificial neural network?

B) Write Notes on (Any Two)   **06**
   1) Describe term bioinformatics and brief history of bioinformatics.
   2) Explain the clustal and tree view software package in protein sequence analysis.
   3) Describe the functions of National centre for Biotechnology (NCBI).

Q.3 A) Attempt any two of the following question.   **08**
   1) Write a note on hashing strategy in FASTA alignment tool.
   2) Explain the knowledge discovery or data mining in bioinformatics.
   3) Write a note on protein family (pfam) secondary sequence database.

B) Answer the following question.(Any One)   **06**
   1) Explain the primary protein sequence database in detail.
   2) Write a detailed account on various bio-molecular sequence file format.

Q.4 **A)** **Answer the following question.(Any Two)** **10**
1) Explain the system biology and with its associated application in details.
2) Write a note on Hidden Markova model and application of HMM in bioinformatics.
3) Write a detailed account on Architecture of Neural network in detail.

B) **Answer the following question.(Any One)** **04**
1) Explain the PAM and BLOSUM scoring matrix in details.
2) Explain the Blast alignment in details.

Q.5 **Answer the following question.(Any two)** **14**
a) Explain the Genbank nucleotide sequence database in details.
b) Write a note on Gene prediction in eukaryotes and prokaryotes.
c) Explain the Support vector machine and application in details.

Seat No.

M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2019
Bioinformatics
CELL BIOLOGY & GENETICS

Day & Date: Tuesday, 05-11-2019   Max. Marks: 70
Time: 11:30 AM To 02:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and labeled diagrams wherever necessary.

Q.1   Fill in the blanks by choosing correct alternatives given below.   14

1) _____ is a cytoplasmic organelle responsible for synthesis of most of the ATP in eukaryotic cells by oxidative phosphorylation.
   a) Ribosome   b) Lysosome
   c) Peroxisome   d) Mitochondria

2) Caspases are the family of proteases they have cysteine residues at their active sites and play important role in _____.
   a) Apoptosis   b) Endocytosis
   c) Necrosis   d) Metastasis

3) _____ is responsible for replication of nuclear DNA in prokaryotes.
   a) DNA polymerase I   b) DNA polymerase III
   c) DNA polymerase II   d) DNA polymerase IV

4) In eukaryotic translation process initiator tRNA molecule carries _____ amino acid.
   a) Valine   b) Methionine
   c) Formylated Methionine   d) Methylated Methionine

5) In mRNA processing, at the 3' end of the transcript _____ is added.
   a) introns   b) 7-methylguanosine cap
   c) intergenic DNA   d) Poly-A tail

6) Origin recognition complex directly binds to _____ for initiation of DNA replication in eukaryotes.
   a) Autonomously replicating sequences
   b) Automatic replicating sequences
   c) Autonomously recognizing sequences
   d) autonomously replacing sequences

7) Coding DNA sequences present in the eukaryotic genes is also known as _____.
   a) Introns   b) Exons
   c) Coding region   d) Euchromatin

8) _____ is a region of contact between cells and the extracellular matrix at which keratin filaments are attached to integrin.
   a) Desmosomes   b) Hemi-desmosomes
   c) Gap junctions   d) Tight junctions

9) _____ play an important role in synaptic signaling.
   a) Neurotansmitter   b) Enzyme
   c) cAMP   d) Hormones

10) _____ is a family of proteins that regulate the activity of Cdks and control progression through the cell cycle.
   a) Cyclins
   b) Cytochromes
   c) Cytochalasin
   d) cyclic GMP

11) _____ is type of passive transport by which the transport of molecules across a membrane by carrier or channel proteins.
   a) Facilitated diffusion
   b) Active transport
   c) Proton pump
   d) Na-K A TPase Pump

12) _____ enzyme is responsible for repair of pyrimidine dimmers during Photoreactivation.
   a) Photolyase
   b) Photo-reductase
   c) Photo-resolvase
   d) Photo-oxidase

13) _____ region is act as binding site for RNA polymerase in prokaryotic gene regulation.
   a) Promoter
   b) Enhancer
   c) Silencer
   d) Operator

14) In NER, the UvrABC complex is frequently called an _____, a name that reflects its ability to directly excise an oligonucleotide.
   a) endonuclease
   b) epinuclease
   c) excinuclease
   d) exonuclease

Q.2 A) Answer the following (Any Four)   **08**
   1) Enlist functions of Golgi complex.
   2) Define MPF.
   3) What are split genes?
   4) Define inducer.
   5) What are chaperonins?
   6) Distinguish between animal and plant cell.

B) Write Short Notes (Any Two)   **06**
   1) What are tight junctions?
   2) Write note on ribosomes.
   3) What is proton pump?

Q.3 A) Answer the following (Any Two)   **08**
   1) Describe ultra structure and functions of mitochondria.
   2) Describe different pathways of programmed cell death.
   3) Explain posttranslational modifications of proteins.

B) Answer the following (Any One)   **06**
   1) Describe Molecular mechanism of general recombination.
   2) Explain process of meiosis with neat labeled diagrams.

Q.4 A) Answer the following (Any Two)   **10**
   1) Describe ultra structure of typical bacterial cell.
   2) Describe process of signal transduction with GPCR.
   3) Justify, DNA as genetic material with classical experiment of Avery McLeod & McCarty.

B) Answer the following (Any One)   **04**
   1) Describe rolling circle model of DNA replication.
   2) Explain regulation of gene expression in trp operon.

Q.5 **Answer the following (Any Two)** **14**
   a) Describe mechanisms of eukaryotic DNA replication.
   b) Explain types of passive transport with suitable examples.
   c) Explain protein trafficking in nucleus and chloroplast.

Seat No.

M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2019
Bioinformatics
INTRODUCTION TO HTML & BIOSTATISTICS

Day & Date: Thursday, 07-11-2019   Max. Marks: 70
Time: 11:30 AM To 02:00 PM

Instructions: 1) All questions are compulsory.
           2) Figures to the right indicate full marks.

Q.1 Fill in the blanks by choosing correct alternatives given below.   **14**

1) HTML is what type of language?
   - a) Scripting language
   - b) Mark-up Language
   - c) Programming Language
   - d) Network protocol

2) The year in which HTML was first proposed _____.
   - a) 1990
   - b) 1980
   - c) 2000
   - d) 1995

3) What should be the first tag in any HTML document?
   - a) <head>
   - b) <title>
   - c) <html>
   - d) <document>

4) Which of the following is not a browser?
   - a) Microsoft Bing
   - b) Netscape Navigator
   - c) Mozilla Firefox
   - d) Opera

5) The key element for viewing web pages is the _____.
   - a) Browser
   - b) Internet
   - c) Link
   - d) Program

6) Which of the following is not a measure of central tendency?
   - a) Mean
   - b) Mode
   - c) Range
   - d) Median

7) Standard deviation is the square of _____.
   - a) Mode
   - b) Standard error
   - c) Variance
   - d) Regression

8) Find the mode in the following data set {11, 12, 13, 14, 14}
   - a) 14
   - b) 12.8
   - c) 13
   - d) 11

9) A circle divided into sectors proportional to the frequency of items shown is called _____.
   - a) Bar chart
   - b) Pie chart
   - c) Histogram
   - d) Polygon

10) Arranging values in columns is called _____.
    - a) Matrix
    - b) Graph
    - c) Cells
    - d) Tabulation

11) HTML program is saved using _____ extension.
    - a) .htql
    - b) .hn
    - c) .html
    - d) .hmt

12) HTML tags are surrounded by _____ brackets.
    a) Squart   b) Angle
    c) Round   d) Curly

13) Basic fundamental Block is called as _____.
    a) HTML Tag   b) HTML Attribute
    c) HTML body   d) HTML Element

14) The term ANOVA was first proposed by _____.
    a) Sir Galton   b) R. A. Fisher
    c) Pearson   d) Maxwell

Q.2 A) Answer the following questions. (Any Four)   **08**
    1) Define tag.
    2) What is Marquee?
    3) Define Mean.
    4) Write versions of HTML.
    5) Define Variance.

B) Write Notes. (Any Two)   **06**
    1) Standard Deviation
    2) Applications of HTML
    3) Chi-square Test

Q.3 A) Answer the following questions. (Any Two)   **08**
    1) Explain in detail account of History of HTML.
    2) Describe in detail collection of Data.
    3) Write note on test for significance.

B) Answer the following questions. (Any One)   **06**
    1) Write and explain types of all from tags.
    2) Write merit and demerit of mean.

Q.4 A) Answer the following questions. (Any Two)   **10**
    1) Write brief account on Graphical representation of data.
    2) Explain briefly get & post methods in html.
    3) Write a note on types of random variables.

B) Answer the following questions. (Any One)   **04**
    1) Explain Coefficient of Variation.
    2) Write a note on Formatting tags, image tags,

Q.5 Answer the following questions. (Any Two)   **14**
    a) Design student registration form using all form tags.
    b) Length of surrounded on length of carrots is given below calculate mean deviation.

9.2	9.6	10	11	12	9.8	10.2	9.9	12.7	10.6

    c) Design and explain program Anchor tag, Name tag, Hyperlinks.

Seat No.	

M.Sc.(Semester - I) (CBCS) Examination Oct/Nov-2019
Bioinformatics
INTRODUCTION TO PROGRAMMING LANGUAGES & PROGRAMMING THROUGH C & C++

Day & Date: Saturday, 09-11-2019   Max. Marks: 70
Time: 11:30 AM To 02:00 PM

Instructions: 1) All questions are compulsory.
　　　　　　　2) Figures to the right indicate full marks.

Q.1   Fill in the blanks by choosing correct alternatives given below.   14

1)   The output of the code below is _____.
```
#include <stdio.h>
void main ()
{
  int x = 5;
  if (x<1)
      Printf("hello");
  if (x==5)
    Printf("hi");
  else
    Printf("no");
}
```
   a)   hi   b)   hello
   c)   no   d)   hihello

2)   OOPs stand for _____
   a)   Oracle Oriented Programming
   b)   Object Oriented Programming
   c)   Operand Oriented Programming
   d)   Open Oriented Project

3)   C is developed by _____.
   a)   Pearson   b)   F. Galton
   c)   Dennis Ritchie   d)   Newton

4)   _____ is a set of instructions to do a particular task.
   a)   Algorithm   b)   Flowchart
   c)   Structure   d)   Program

5)   _____ is an executable function, which is predefined for printing the output from a program.
   a)   printf   b)   main
   c)   getch   d)   put

6)   An array of characters is _____.
   a)   Constant   b)   Pointer
   c)   Constant   d)   String

7)   The modules in C are known as _____.
   a)   Array   b)   Keywords
   c)   Functions   d)   Module

8) _____ are variables that have several parts; each part of the object can have different types.
   a) Class
   b) Structure
   c) Block
   d) Control.

9) _____ is a function used to accept input from the user.
   a) main()
   b) scanf()
   c) printf()
   d) getch()

10) The basic editor for performing any programs related with computer is _____.
    a) Notepad
    b) Excel
    c) Word
    d) PPT

11) Computer languages lack _____.
    a) Knowledge
    b) Data
    c) Information
    d) ambiguity

12) ANSI stands for _____.
    a) Asian National Standard Institute
    b) American National Secure Institute
    c) American National Standard Institute
    d) American National Standard Information

13) The friend function in C++ is used to access _____ members of that class.
    a) Public
    b) Private
    c) Protected
    d) Virtual

14) To define it outside the class, a _____ operator is used.
    a) Semicolon(;)
    b) Comma(,)
    c) Scope resolution(::)
    d) Colon(:)

Q.2 A) Answer the following questions. (Any Four)   08
   1) Define Flowchart.
   2) What is mean by Inheritance?
   3) Define Keyword.
   4) Write the syntax of C?
   5) Write types of array with example.

B) Write Notes on. (Any Two)   06
   1) Write a note on OOP.
   2) Explain features of C.
   3) Explain Operator in C++.

Q.3 A) Answer the following questions.(Any two)   08
   1) Write a note on decision making and branching.
   2) Explain in detail string and also explain its types.
   3) Write small program on floating value with output in C.

B) Answer the following question.(Any One)   06
   1) Write a note on History of C.
   2) Write a short note on pointers with example.

Q.4 A) Answer the following question.(Any Two)   10
   1) Explain in detail Polymorphism.
   2) What is Overloading? Explain its type?
   3) Conditional Statements with example in C++

B) Answer the following question.(Any One)   04
   1) Explain in detail account on functions in C.
   2) Briefly explain the structure of C++ program.

Q.5 **Answer the following questions. (Any Two)** **14**
  a) Write nested if else program using C.
  b) Write C++ program on constructor.
  c) Explain Virtual Functions in C++

Seat No.	

M.Sc. (Semester - II) (CBCS) Examination Oct/Nov-2019
Bioinformatics
ADVANCED BIOINFORMATICS

Day & Date: Monday, 04-11-2019   Max. Marks: 70
Time: 11:30 AM To 02:00 PM

Instructions: 1) All questions are compulsory.
         2) Figures to the right indicate full marks.

Q.1 Fill in the blanks by choosing correct alternatives given below.   **14**

1) The original SAGE technique was developed by Dr. _____ at the Oncology Center of Johns Hopkins University.
   a) Victor Velculescu   b) Henikoff
   c) Dayhoff   d) Pearson

2) _____ are DNA elements located in the vicinity of gene start sites which serve as binding sites for the gene transcription machinery.
   a) Transciption   b) Catalytic
   c) Binding   d) Promoters

3) A _____ pathway is a linked series of chemical reactions occurring within a cell.
   a) acyclic   b) drug
   c) cyclic   d) metabolic

4) A _____ genome is DNA assembly which assembled by scientists as a representative example of a species set of genes.
   a) Ab intio   b) In Vivo
   c) Reference   d) Multiple

5) Molecular Evolutionary Genetics _____ is a freely available software for conducting statistical analysis of molecular evolution and for constructing phylogenetic trees.
   a) Analysis   b) Anatomy
   c) Annotation   d) Assembly

6) _____ database is produced and curated at the Johns Hopkins University School of Medicine.
   a) SNP   b) OMIM
   c) SAGE   d) Uniprot

7) _____ is an assumption by which molecular sequences evolve at constant rates and amount of mutations is proportional to evolutionary time.
   a) Taxonomy   b) Phylogeny
   c) Molecular clock   d) Molecular rate

8) _____ is a tool predicts potential protease cleavage sites and sites cleaved by chemicals in a given protein sequence.
   a) Pepmod   b) PeptideCutter
   c) Findmod   d) Pepcuter

9) In Needleman-Wunsch algorithm in local alignment _____ scoring matrix cells are set to zero.
   a) pam   b) blosum
   c) positive   d) negative

10) _____ type of SNPs do not affect the protein sequence in disease.
   a) Misense
   b) Nonsense
   c) Synonymous
   d) Nonsynomys

11) _____ structure alignment program used to compare the structure similarity.
   a) Emboss
   b) Sheet
   c) Dali
   d) Coil

12) In sequence similarity among group of sequence they can be considered as belonging _____ family.
   a) desent
   b) same
   c) divergent
   d) different

13) β-sheet consists of two or more _____ having an extended zigzag conformation.
   a) β -strands
   b) helix
   c) coil
   d) loops

14) The major difference between Blast2 results and the typical Blast output is the presentation of the _____.
   a) graph
   b) table
   c) Alignment
   d) query

Q.2 A) Answer the following questions. (Any Four)   **08**
   1) What is SAM method?
   2) What is Metabolomics pathway?
   3) What is suffix tree in proteomics?
   4) What is Protparam tool?
   5) What is molecular datatypes?

B) Write Notes on. (Any Two)   **06**
   1) Explain the algorithm for generation of sequence profiles.
   2) Explain the identification of genet in OMIM database.
   3) Explain the distance based method in detail.

Q.3 A) Answer the following questions. (Any Two)   **08**
   1) Explain the MEGA software package in phylognetic analysis.
   2) Write in detail about progressive alignment in MSA.
   3) Give the detailed deviation on blosum scoring matrix.

B) Answer the following questions. (Any One)   **06**
   1) Explain the MEGA Blast and PSI- Blast in detail.
   2) Give a detailed note on Secondary structure elements in detail.

Q.4 A) Answer the following questions. (Any Two)   **10**
   1) Explain the plant and animal database in detail.
   2) Explain the use of hidden markov models in MSA.
   3) Give a detailed note on DNA microarray and applications in different fields.

B) Answer the following questions. (Any One)   **04**
   1) Write in detail about the SNP database.
   2) Write the prediction methods in splice sites, regulatory regions.

Q.5 Answer the following questions. (Any Two)   **14**
   a) Explain the protein array and its applications in detail.
   b) Write in detail about the Expasy proteomics server and its tools.
   c) Give a detail account on Smith waterman algorithm in alignment in detail.

Seat No.

M.Sc. (Semester - II) (CBCS) Examination Oct/Nov-2019
Bioinformatics
MICROBIOLOGY AND BIOTECHNOLOGY

Day & Date: Wednesday, 06-11-2019   Max. Marks: 70
Time: 11:30 AM To 02:00 PM

Instructions: 1) All questions are compulsory.
            2) Figures to the right indicate full marks.
            3) Draw neat and labeled diagrams wherever necessary.

Q.1   **Fill in the blanks by choosing correct alternatives given below.**   **14**

1) In the microbiological media _____ is used to maintain isotonicity of the medium.
    a) Agar   b) Peptone
    c) glycerol   d) NaCl

2) Out of the following _____ are anaerobic bacteria.
    a) Rickettsia   b) Mycoplasma
    c) Archae   d) Chlamydia

3) The number of bacterial cells in the culture medium exponentially increases in _____ phase.
    a) Lag   b) Log
    c) stationary   d) decline

4) The adult stem cells are _____.
    a) Pluri potent   b) Toti potent
    c) Differentiated   d) Re-differentiated

5) Body fluids are the essential components of _____ media.
    a) Plant tissue culture   b) animal cell culture
    c) bacterial cell culture   d) Fungi culture

6) The transfer of genetic material from one bacterial cell to other through the external medium is called as _____.
    a) Conjugation   b) Transformation
    c) Transduction   d) Transfection

7) Multiple cloning sites are the sites for _____.
    a) OriC   b) Scorable marker
    c) Restriction enzyme   d) Selectable marker

8) The most efficient method of gene transfer is _____.
    a) Biolistic gun   b) Electroporation
    c) Lipofection   d) Microinjection

9) Capsule of the bacteria can be stained by _____ staining method.
    a) Maneval's   b) Chance's
    c) Gram's   d) Albert's

10) The bacterial spore contains significantly _____ that gives heat resistance to heat.
    a) Cellulose   b) Calcium Dipicolinate
    c) Peptidoglycan   d) fatty acids

11) Golden rice is rich in _____.
   a) Gold
   b) Vitamin A
   c) Fatty acids
   d) Proteins

12) The smallest pathogens ever known which are composed only of a nucleotide sequence are called as _____.
   a) Viroids
   b) Viruses
   c) Nucleocapsids
   d) Prions

13) The viruses which infect the host by integrating its genome in hosts genome are called as _____ phages.
   a) temperate
   b) lytic
   c) virulent
   d) killing

14) The Laminar Air Flow contains _____ filters in it.
   a) Whatman's
   b) Nitrocellulose
   c) HEPA
   d) Polymer

Q.2 A) Answer the following questions. (Any Four)   **08**
   1) Define Conjugation.
   2) Define Single cell protein.
   3) Define Sterilization.
   4) Write names of stains used in Gram's staining technique.
   5) Define Phagemid.

B) Write Notes. (Any Two)   **06**
   1) Chemical agents as disinfectants
   2) Write a note on somatic gene therapy.
   3) Explain the structure of T4 phage with neat & labeled diagram.

Q.3 A) Answer the following questions. (Any Two)   **08**
   1) Add a note on advantages and disadvantages of GMOs.
   2) Explain the Chance's method for cell wall staining of bacteria.
   3) Explain the pUC18 vector with a neat diagram.

B) Answer the following questions. (Any One)   **06**
   1) Explain the methods for isolation of microorganisms.
   2) Add a note on Artificial animal cell culture medium.

Q.4 A) Answer the following questions. (Any Two)   **10**
   1) Explain the gene transfer methods in plants.
   2) Describe transduction process with one example.
   3) Write a note on heat sterilization methods.

B) Answer the following questions. (Any One)   **04**
   1) Give general characters of Archaebacteria.
   2) Add a note on cellular differentiation and Totipotency.

Q.5 Answer the following questions. (Any Two)   **14**
   a) Explain in detail lysogeny of lambda phage.
   b) Give a detailed account of methods of classification of bacteria.
   c) Write a note on applications of r-DNA technology.

Seat No.

M.Sc. (Semester - II) (CBCS) Examination Oct/Nov-2019
Bioinformatics
BASIC BIOCHEMISTRY AND IMMUNOLOGY

Day & Date: Friday, 08-11-2019   Max. Marks: 70
Time: 11:30 AM To 02:00 PM

Instructions: 1) All questions are compulsory.
              2) Figures to the right indicate full marks.

Q.1 **Fill in the blanks by choosing correct alternatives given below.**   **14**

1) ATP is an end product of _____.
   - a) beta oxidation
   - b) kreb cycle
   - c) glycolysis
   - d) c4 pathway

2) The carbon atom which is bounded by four different groups is called _____.
   - a) symmetric
   - b) asymmetric
   - c) unsaturated
   - d) saturated

3) The active state of protein structure is _____.
   - a) Primary
   - b) secondary
   - c) Tertiary
   - d) quaternary

4) The organization dealing with nomenclature of enzymes is _____.
   - a) IUPAC
   - b) IBAB
   - c) IUBMB
   - d) EBI

5) With increase in temperature, the enzyme activity _____.
   - a) increases
   - b) remains same
   - c) decreases
   - d) stops

6) Glycogen is an example of _____polysaccharide.
   - a) structural
   - b) storage
   - c) functional
   - d) wastage

7) The major chemical bond present in lipids is _____.
   - a) Peptide
   - b) glycosidic
   - c) Ester
   - d) phosphor diester

8) The overall basic units present in nucleic acids are _____.
   - a) 3
   - b) 4
   - c) 5
   - d) 6

9) An example of primary metabolite is _____.
   - a) Glucose
   - b) carotene
   - c) acetylcholine
   - d) alkaloid

10) Plasma cells are involved in ____ immunity.
   - a) CMI
   - b) HMI
   - c) Innate
   - d) non specific

11) There are _____types of T cell subsets.
   - a) 3
   - b) 4
   - c) 5
   - d) 7

12) Interferon are highly specific towards _____.
 a) Bacteria　　　　　　　　　b) virus
 c) Fungi　　　　　　　　　　　d) Protozao

13) _____ is also called as antigen presenting cell.
 a) T cell　　　　　　　　　　b) B cell
 c) macrophage　　　　　　　d) memory cell

14) _____ is an example of hypersensitivity reaction.
 a) Anemia　　　　　　　　　　b) typhoid
 c) arthritis　　　　　　　　　d) asthma

Q.2 A) Answer the following questions.(Any Four)　　　　　　08
 1) Define Bioenergetics.
 2) Define enzyme substrate complex.
 3) What is secondary metabolite?
 4) What is Thymus?
 5) Define Autoimmunity.

B) Write Notes on (Any Two)　　　　　　　　　　　　　06
 1) Add a note on chemical bonds involved in protein structure.
 2) Write a note on classification of lipids.
 3) Add a note on different types of adaptive immunity.

Q.3 A) Answer the following questions. (Any Two)　　　　　08
 1) Write a note on generation & maturation of lymphocytes.
 2) Write a note on ATP as main source of energy in biological system.
 3) Explain various factors involved in innate immunity.

B) Answer the following questions. (Any One)　　　　　06
 1) Write a note on components of lymphatic system.
 2) Add a note on secondary structure of proteins.

Q.4 A) Answer the following questions.(Any Two)　　　　　10
 1) Define Haematopoiesis. Add a note on generation of immune cells.
 2) Add a note on vitamins and secondary metabolites.
 3) Write a note on types of antigen antibody interactions.

B) Answer the following questions.(Any One)　　　　　04
 1) Explain the types of immunoglobulins.
 2) Add a note on hormones and their importance.

Q.5 Answer the following questions.(Any Two)　　　　　　14
 a) Define enzyme-Add a note on factors affecting enzyme activity.
 b) Write a note on CMI and HMI.
 c) Write in detail the classification of carbohydrates.

Seat No.

Set P

M.Sc. (Semester - III) (CBCS) Examination Oct/Nov-2019
Bioinformatics
BIOLOGICAL DATABASE MANAGEMENT SYSTEM

Day & Date: Monday, 18-11-2019   Max. Marks: 70
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1   Fill in the blanks by choosing correct alternatives given below.   14

1)   In early processing systems, an organization's information was stored as groups of records in separate files, called _____.
a)   data files   b)   text files
c)   files   d)   flat files

2)   The term ____ is used to refer to a row.
a)   Attribute   b)   Tuple
c)   Field   d)   Instance

3)   For each attribute of a relation, there is a set of permitted values, called the _____ of that attribute.
a)   Domain   b)   Relation
c)   Set   d)   Schema

4)   In the relational modes, cardinality is termed as _____.
a)   Number of tuples   b)   Number of attributes
c)   Number of tables   d)   Number of constraints

5)   Relational calculus is a _____.
a)   Procedural language   b)   Non-Procedural language
c)   Data definition language   d)   High level language

6)   In E-R Diagram relationship type is represented by _____.
a)   Ellipse   b)   Dashed ellipse
c)   Rectangle   d)   Diamond

7)   To delete a particular column in a relation the command used is _____.
a)   UPDATE   b)   DROP
c)   ALTER   d)   DELETE

8)   The _____ operator is used to compare a value to a list of literals values that have been specified.
a)   BETWEEN   b)   ANY
c)   IN   d)   ALL

9)   A data manipulation commands the combines the records from one or more tables is called _____.
a)   SELECT   b)   PROJECT
c)   JOIN   d)   PRODUCT

10) A table joined with itself is called _____.
a)   Join   b)   Self Join
c)   Outer Join   d)   Equi Join

11) Architecture of the database can be viewed as _____.
   a) Two levels   b) Four levels
   c) Three levels   d) One level

12) Which of the following is used to declare a record?
   a) %ROWTYPE   b) %TYPE
   c) %CHAR   d) %DATE

13) Which key provides the basic tuple-level addressing mechanism in a relational system?
   a) Candidate   b) Alternative key
   c) Primary key   d) Foreign key

14) Which of the following is not a built in aggregate function in SQL?
   a) avg   b) max
   c) total   d) count

Q.2 A) Attempt any four of the following question.   **08**
   1) What is mean by Schema?
   2) Write types of integrity constraints.
   3) Define RDBMS.
   4) Write features of DBMS.
   5) Define relation.

B) Write Notes on (Any Two)   **06**
   1) Write a note on Hierarchical model.
   2) Explain in detail functions of DBMS.
   3) Write a short note on Database Model.

Q.3 A) Attempt any two of the following question.   **08**
   1) Write a note on 'History of DBMS'.
   2) Describe in detail PLSQL and its Statements.
   3) Explain in detail data types in RDBMS.

B) Attempt any one of the following question.   **06**
   1) Create table using DDL commands.
   2) Write levels of abstraction in DBMS.

Q.4 A) Attempt any two of the following question.   **10**
   1) Explain in detail types of integrity constraints.
   2) Write a simple program on DQL statements.
   3) Describe Overview of Data mining.

B) Attempt any one of the following question.   **04**
   1) Write a short note on Relational Model.
   2) Explain in detail Join operation in SQL.

Q.5 Attempt any two of the following question.   **14**
   1) Give brief account on Features of PL/SQL.
   2) Create a non- biological table by using SQL commands.
   3) Write a note on Data Normalization.

Seat No.

M.Sc. (Semester - III) (CBCS) Examination Oct/Nov-2019
Bioinformatics
ADVANCED BIOPHYSICAL TECHNIQUES

Day & Date: Tuesday, 05-11-2019   Max. Marks: 70
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
                          2) Figures to the right indicate full marks.

Q.1   Multiple Choice Questions.   **14**

1)   For_____ of the following molecules would you except the infrared active
     fundamentals to be Raman inactive and vice versa.
     a) NO_2 b) Fluorobenzene
     c) Benzene   d) Fluroethene

2)   _____many types of sources of optical light are available.
     a) One   b) Two
     c) Three   d) Four

3)   The radiation emission process (emission of a proton at frequency) can
     occur in _____ways.
     a) Two   b) Three
     c) Four   d) One

4)   If atoms of the following pairs of elements need to be clearly distinguished
     in a crystal structure, for_____ pair does neutron diffraction offer the
     greatest advantage compared with X-ray diffraction.
     a) C and O   b) C and N
     c) N and Cl (natural isotope ratio)   d) W and Re

5)   _____of the following is not a standard feature of protein crystals
     compared with small- molecule crystals
     a) Less well shaped crystals
     b) Larger unit cells
     c) Higher sensitivity to X-ray radiation damage
     d) Lower diffraction intensities

6)   _____ process gives the laser its special properties as an optical source.
     a) Dispersion   b) Stimulated absorption
     c) Spontaneous emission   d) Stimulated emission

7)   _____ of the following cannot be obtained from an X-ray crystallography
     study.
     a) Bond angle Si-O-Si in a mineral.
     b) The absolute configuration of a chiral natural product
     c) The degree of folding of a Zm_2Cl_2 four membered ring
     d) The vibration frequency of a carbonyl group

8)   _____of the following molecules will not display an infrared spectrum.
     a) CO_2 b) N_2
     c) Benzene   d) HCCH

9) _____one of the following nuclei has a magnetic moment (so that an NMR experiment can be preformed).
a) ^{12}C b) ^{16}O
c) ^{14}N d) ^{32}S

10) In a proton NMR experiment with a frequency (v) of 60 MHz, the magnetic field B required for resonance is 1.4 T. Calculate the magnetic field required for resonance of the proton in a spectrometer with a frequency of 500 MHz.
a) 2.8 T   b) 11.7 T
c) 0.7 T   d) 14.T

11) In a time-of-flight mass spectrometer, the velocity v of an accelerated ion is related to its mass by_____ of the following.
a) Proportional to m (its Mass)
b) Inversely proportional to its mass
c) Proportional to the square root of its mass
d) Inversely proportional to the square root of its mass

12) For the molecule CBr4, the number of peaks which comprise the cluster for the molecular ion will be _____ of the following.
a) 1   b) 4
c) 5   d) 3

13) A device which converts electrical energy in the form of a current into optical energy is called as_____
a) Optical source   b) Optical coupler
c) Optical isolator   d) Circulator

14) _____of the following pairs of molecules exhibit both a pure rotational spectrum and a rotational Raman spectrum.
a) O_2 and H_2O b) CO_2 and N_2O
c) CO and CH_4 d) NO and DCCH

Q.2 A) Answer the following (Any Four)   08
1) Metallic Bond
2) ORD
3) Laser
4) Crystal
5) Objective lens

B) Write Notes on (Any Two)   06
1) Image formation in XRD.
2) Atomic Force microscopy
3) Electron density

Q.3 A) Answer the following (Any two)   08
1) Add a note on non-covalent interactions.
2) Sample preparation for Infrared Spectroscopy.
3) Types of monochromators.

B) Answer the following (Any One)   06
1) MALDI TOF
2) Types of Lasers

Q.4 A) Answer the following (Any Two)   **10**
1) Write a note on principle of NMR
2) Ionic character of co-valent bonds.
3) Explain parts of compound microscopy

B) Answer the following (Any One)   **04**
1) Importance and application of lasers in biological studies.
2) Add a note on principle of TEM.

Q.5 Answer the following (Any two)   **14**
a) Briefly explain the theory and instrumentation of UV- Visible spectroscopy.
b) Discuss about the fluorescent and confocal Microscopy.
c) Application of X-rays in Diagnosis and Molecular Structure studies.

Seat No.

M.Sc. (Semester - III) (CBCS) Examination Oct/Nov-2019
Bioinformatics
COMPUTATIONAL STRUCTURE BIOLOGY AND DRUG DESIGNING

Day & Date: Thursday, 07-11-2019   Max. Marks: 70
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1   Fill in the blanks by choosing correct alternatives given below.   14

1) PDB transferred to Research Collaborator for structural Bioinformatics (RCBS) in _____.
   a) 1961   b) 1959
   c) 2000   d) 1998

2) _____ rotatable bond should be present in drug.
   a) ≤ 5 b) ≤ 10
   c) $\geq$ d) ≥ 5

3) _____ is constructed for a group of related protein structure.
   a) Threading   b) Profile
   c) Homology   d) Pairwise Energy

4) _____ of the following is not a primary target of drug action.
   a) Carriers   b) Enzymes
   c) hormones   d) Receptors

5) _____ is a third generation prediction algorithm with use of MSA for prediction secondary structure.
   a) GOR   b) Chou Fasman
   c) Neural network   d) HMM

6) Pharmacodynamics involves the following _____.
   a) Biotransformation of drugs in the organism
   b) Distribution of drug in the organism
   c) Mechanism of drug action
   d) Excretion of the drug from the organism

7) To build the 3D structure model the template should be _____ identity.
   a) >25%   b) >75%
   c) >30%   d) None of these

8) _____ is drug metabolizing enzymes.
   a) Protease   b) CYP2A
   c) Kinase   d) Amylase

9) MACiE is collaborative project between the group of _____ at EBI and Mitchell group.
   a) United States   b) Thronton
   c) Henikoff   d) Dayhoff

10) _____ algorithm was used in docking.
    a) Flexible   b) Fixed
    c) Rigid   d) Genetic

11) Prion related illness such as creutzzfeldt-Jackobb disease caused by
_____.
a) Misfolding   b) Domain
c) Folding   d) Motif

12) EC_{50} refers to drug _____.
a) Potency   b) Efficacy
c) Strength   d) Dose

13) A _____ is a conserved part of a protein that evolved into function region.
a) Domain   b) Moitif
c) Binding site   d) Active site

14) Drugs combine with receptor and elicit submaximal response are called
_____.
a) Antagonist   b) Partial Agonist
c) Affinity   d) Agonist

Q.2 A) Answer the following questions. (Any Four)   **08**
1) What is DIP database?
2) What is wiring diagram in pdbsum database?
3) What is HTS in drug discovery?
4) What is pairwise structure alignment?
5) What is buldge loop in RNA structureprediction?

B) Write Notes. (Any Two)   **06**
1) Explain the PDBeFold database in detail.
2) Describe the importance of pro-drug.
3) Explain catalytic site atlas database in details.

Q.3 A) Answer the following questions. (Any Two)   **08**
1) Explain the structure validation method in bioinformatics.
2) Explain the QSAR studies in drug discovery and designing.
3) Explain the protein-protein interaction databases in detail.

B) Answer the following questions. (Any One)   **06**
1) Explain the fold recognition method for prediction protein 3D structure.
2) Explain the protein folding and protein misfolding disorders in detail.

Q.4 A) Answer the following questions. (Any Two)   **10**
1) Explain the protein family classification steps and its database in details.
2) Explain neural network based secondary structure prediction methods.
3) Write in details about the combinatorial chemistry in lead identification.

B) Answer the following questions. (Any One)   **04**
1) Describe drug metabolism in detail.
2) Explain types of secondary structure elements.

Q.5 Answer the following questions. (Any Two)   **14**
a) Explain the comparative modeling and its application in 3D structure prediction.
b) Explain the molecular docking steps using AUTODOCKS tool.
c) Explain the phases of clinical trials in details.

Seat No.

M.Sc. (Semester - IV) (CBCS) Examination Oct/Nov-2019
Bioinformatics
BIOLOGICAL SIMULATION AND MODELING

Day & Date: Monday, 04-11-2019   Max. Marks: 70
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Fill in the blanks by choosing correct alternatives given below.   14

1) Python was developed by _____.
   a) Stave Jobs   b) Dennis Ritchi
   c) Larry Wall   d) Guido van Rossum

2) _____ is a named piece of memory that can store a value.
   a) Variable   b) Array
   c) Static   d) Character

3) IDLE stands for _____.
   a) Inverse Development Environment
   b) Invented Development Environment
   c) Independent Development Environment
   d) Integrated Development Environment

4) _____ is a sequence of text characters in a program.
   a) Code   b) operator
   c) Program   d) String

5) Python was released publicly in _____.
   a) 1941   b) 1991
   c) 1981   d) 1971

6) Which of the following statements is used to create an empty set?
   a) { }   b) set()
   c) []   d) <>

7) What is the result of expression shown below if x=56.236?
   a) 56.00   b) 56.24
   c) 56.23   d) 0056.236

8) Simulation is _____ of real events.
   a) watching   b) copying
   c) deleting   d) mimicking

9) The last step of simulation is _____.
   a) energy minimization   b) geometry optimization
   c) model building   d) Dynamic study

10) SIR model is a part of _____ model.
    a) population   b) plant
    c) epidemic   d) chemical

11) Force field in simulation represents _____ parameter.
    a) Temperature   b) Energy
    c) Humidity   d) mass

12) The word conformer is associated with _____ of molecule
    a) structure   b) function
    c) origin   d) composition

13) AutoDock is an example of _____.
    a) MD   b) MM
    c) MC   d) MA

14) Statics refers to _____of an entity.
    a) motion   b) stationary
    c) interaction   d) vibration

Q.2 A) Answer the following. (Any Four)   **08**
    1) Define the term modules.
    2) Write any four keywords in python.
    3) Write python syntax and explain it.
    4) Define Torsion angles.
    5) Define Simulation.

B) Answer the following. (Any Two)   **06**
    1) Write a note on Python Indentation.
    2) Add a note on applications of simulations.
    3) Write a note on conformational search in simulation.

Q.3 A) Answer the following. (Any Two)   **08**
    1) Explain a detail account on Python file handling and processing.
    2) Write a note on molecular mechanics.
    3) Explain python list and its functions in detail.

B) Answer the following. (Any One)   **06**
    1) Define python variable and explain its type with example.
    2) Write a note on principles of simulations.

Q.4 A) Answer the following. (Any Two)   **10**
    1) Explain python data types in detail.
    2) Add a note on human system models in simulations.
    3) Write features of python. Explain features in detail.

B) Answer the following. (Any One)   **04**
    1) List out Biopython tools with its applications.
    2) Add a note on geometry optimization

Q.5 Answer the following (Any Two)   **14**
    a) Explain a detail account on Python object oriented.
    b) Write a program on python dictionary and explain its functions.
    c) Add a note on biological models of simulations.

Seat
No.

M.Sc. (Semester - IV) (CBCS) Examination Oct/Nov-2019
Bioinformatics
CLINICAL BIOINFORMATICS

Day & Date: Wednesday, 06-11-2019　　　　　　　　　　Max. Marks: 70
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
　　　　　　　　2) Figures to the right indicate full marks.

Q.1　Fill in the blanks by choosing correct alternatives given below.　　14

1) _____ provides a solution to this problem by incorporating popular open-source and community linux command line tools into an easy to use web-based environment.
   a) EMBL　　　　　　　　　b) Uniprotkb
   c) EBI　　　　　　　　　　d) Galaxy

2) _____ based approaches rationale behind this type of methods is the expectation of conserved interactions between a pair of proteins which have interacting homologs in another species.
   a) Distance　　　　　　　b) Character
   c) Evolution　　　　　　　d) Homology

3) _____ describe the process to be followed in conducting data management activities and support the obligation to follow applicable laws and guidelines.
   a) AMC　　　　　　　　　b) GPS
   c) SOP　　　　　　　　　d) DIS

4) Creating a cellular model has been a particularly challenging task of _____ biology and mathematical biology.
   a) Aquactic　　　　　　　b) Desert
   c) Grassland　　　　　　　d) System

5) _____ are a large family of diseases that involve abnormal cell growth with the potential to invade or spread to other parts of the body.
   a) Asthma　　　　　　　　b) Copd
   c) Cancers　　　　　　　d) Alzimers

6) _____ toolkit is a collection of command line tools for Short-Reads FASTA/FASTQ files preprocessing.
   a) BLAST　　　　　　　　b) CLUSTAL
   c) ORF　　　　　　　　　d) FASTX

7) _____ to determine the amount to be paid to the provider in healthcare system.
   a) Provider　　　　　　　b) Insurance
   c) Payer　　　　　　　　d) Service

8) _____ have various functions, including fuel, structure, signaling, stimulatory and inhibitory effects on enzymes, catalytic activity of their own.
   a) Metabolites　　　　　　b) Transcription
   c) Regulatory　　　　　　d) Cofactor

9) _____ also called whole transcriptome shotgun sequencing (WTSS), uses next-generation sequencing (NGS) to reveal the presence and quantity of RNA in a biological sample.
   a) Protein-Seq
   b) DNA-Seq
   c) CHIP-Seq
   d) RNA-Seq

10) _____ systems biology is an example of the systems biology approach, which can be distinguished by the specific object of study (tumorigenesis and treatment of cancer).
   a) Metabolome
   b) Immune
   c) Respiratory
   d) Cancer

11) Protein misfolding in _____ diseases are classified as proteopathies as they are associated with the aggregation of misfolded proteins.
   a) Neurodegenerative
   b) Heart
   c) Infectious
   d) Parasitic

12) Cystic fibrosis is caused by mutations in the _____ gene and is the most common recessive disorder in caucasian populations with over 1,300 different mutations known.
   a) CNTR
   b) HTVR
   c) CTIN
   d) CFTR

13) _____ modification was first detected on a genome wide level through the coupling of chromatin immunoprecipitation (ChIP) technology with DNA microarrays termed ChIP-Chip.
   a) Histone
   b) Carbohydrate
   c) Lipid
   d) Protein

14) _____is an interpreted language users typically access it through a command-line interpreter.
   a) Java
   b) Perl
   c) Visual Basic
   d) R

Q.2 **A)** **Answer the following questions.(Any Four)**   **08**
   1) What is R studio software package?
   2) What is ecological model system biology?
   3) What is international classification disease?
   4) What is adverse drug effect?
   5) What is Genome wide association study?

B) **Write Notes on. (Any Two)**   **06**
   1) Write a note on the pharmacovigilance process in human health.
   2) Give a detailed note on RNA sequence analysis.
   3) Explain the detail on transcriptomics.

Q.3 **A)** **Answer the following questions.(Any Two)**   **08**
   1) Write in detail about computational methods of host pathogen interactions.
   2) Give the description on the metabolome.
   3) Explain the clinical data management in clinical research.

B) **Answer the following questions. (Any One)**   **06**
   1) Write the implications of human genome project in human health.
   2) Explain the R programming and its applications.

Q.4 **A)** **Answer the following question. (Any Two)**   **10**
   1) Explain the role of medical coder in healthcare.
   2) Write in detail on the next generation sequencing quality control tools.
   3) Give the bacterial, pathogen and fungal genome project in detail.

   B) **Answer the following questions. (Any One)**   **04**
   1) Explain the ensembl and map viewer database.
   2) Explain reference based assembly next generation sequencing.

Q.5 **Answer the following questions. (Any Two)**   **14**
   a) Write in detail about next generation sequencing data annotation.
   b) Give a detail account on medical informatics and its applications.
   c) Explain the causes and treatment strategies for cancer in detail.

Seat No.

M.Sc. (Semester - IV) (CBCS) Examination Oct/Nov-2019
Bioinformatics
RESEARCH METHODOLOGY AND IPR IN BIOINFORMATICS

Day & Date: Friday, 08-11-2019   Max. Marks: 70
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
                 2) Figures to the right indicate full marks.

Q.1 **Fill in the blanks by choosing correct alternatives given below.**   **14**

1) Plant Breeder's Rights Act came in _____ year.
   a) 1994   b) 1998
   c) 2000   d) 2010

2) _____ research involves examining past events to draw conclusions and make predictions about the future.
   a) Fundamental   b) Applied
   c) Historical   d) Emperical

3) Protection of a plant variety is offered by UPOV system in the form of _____.
   a) Breeders right   b) Technology transfer
   c) Geographical indication   d) Copyright

4) Design of nano car comes under _____ form of protection.
   a) Patent   b) Trademark
   c) Logo   d) Trade secret

5) A significant difference between expected frequencies and observed frequencies is determined by _____ test.
   a) ANOVA   b) Chi square
   c) Probability   d) SPSS

6) Patent granted for innovation for a specified period of _____ years.
   a) 20   b) 30
   c) 40   d) 50

7) Sampling theory helps us to estimate _____ population.
   a) Unknown   b) Known
   c) Particular   d) Universal

8) The is _____ the statement of expectation or prediction that would be tested by research.
   a) literature review   b) hypothesis
   c) Abstract   d) manuscript

9) A good research method should lead to _____.
   a) No novelty   b) no significance
   c) creates good problem   d) Originality

10) _____ of the following is not covered under Intellectual Property Rights.
   a) Copyrights   b) Patents
   c) Trade Marks   d) Thesaurus

11) The _____ is measure of frequency of average article citation in a journal period of time.
   a) Citation index
   b) h index
   c) Journal's scope
   d) Impact factor

12) Action research means _____.
   a) A longitudinal research
   b) A research initiated to solve an immediate problem
   c) A pure research
   d) A research with socioeconomic objective

13) The _____ data is the information collected by an investigator himself for a specific research.
   a) primary
   b) secondary
   c) significance
   d) co-relation

14) _____ of the following is not a type of copyright work.
   a) Literary works
   b) wood
   c) Sculpture
   d) Musical works

Q.2 A) Answer the following questions. (Any Four) 08
   1) What is trade mark?
   2) What is primary data?
   3) What is breeder's right?
   4) What is research problem?
   5) What is invention?

B) Write Notes. (Any Two) 06
   1) Write note on ANOVA one way test.
   2) Write note on patenting biological material with respect to turmeric.
   3) Write note on testing for significance of difference between means.

Q.3 A) Answer the following questions. (Any Two) 08
   1) Write note on patent offices and their territorial jurisdiction.
   2) Write a note on review of literature.
   3) Describe the meaning of research and types of research.

B) Answer the following questions. (Any One) 06
   1) Describe the use of audiovisual aids in research.
   2) Explain the Farmer's right.

Q.4 A) Answer the following questions. (Any Two) 10
   1) Describe the copy rite and its procedure.
   2) Describe the testing of significance variance and correlation.
   3) Write note on fundamental and applied research.

B) Answer the following questions. (Any One) 04
   1) What is GI? Explain with an example.
   2) Describe author instruction for preparation of manuscript.

Q.5 Answer the following questions. (Any Two) 14
   a) Explain the research design and a note on types of research.
   b) What is plant breeders right? Explain its advantages and disadvantages.
   c) Explain patenting procedure in India.

Seat
No.

M.Sc. (Semester - IV) (CBCS) Examination Oct/Nov-2019
Bioinformatics
EMERGING AREAS OF BIOINFORMATICS

Day & Date: Monday, 11-11-2019   Max. Marks: 70
Time: 03:00 PM To 05:30 PM

Instructions: 1) All questions are compulsory.
            2) Figures to the right indicate full marks.

Q.1 Fill in the blanks by choosing correct alternatives given below.   **14**

1) 0D is the descriptors derived from _____ in chemical information system.
   a) Molecular formula   b) SMILE
   c) WLN   d) SMART

2) The term biodiversity informatics was coined by _____.
   a) John Crenter   b) Margaret dayhoff
   c) Ernst Hackel   d) John whiting

3) In multiple compounds of sdf file are delimited by lines consisting _____.
   a) $$$ b) $$$$
   c) rs#   d) ####

4) _____ methods involve the assembly of atoms or molecules into nanostructured arrays.
   a) Bottom up   b) Top down
   c) Mixed   d) Hybrid

5) _____ means to communicate the molecular graph to and from the computer.
   a) Connection table   b) Molecule
   c) Hashing   d) Notations

6) SIFT online tool predicts whether an amino acid Substitution affect protein _____.
   a) sequence   b) structure
   c) function   d) motif

7) SMILES strings include connectivity but do not include _____ atoms are not represented.
   a) oxygen   b) nitrogen
   c) hydrogens   d) carbon

8) _____ is an improvement on vaccinology that employs bioinformatics, pioneered by Rino Rappuoli and first used against Serogroup B meningococcus.
   a) Reverse Virology   b) Virulence
   c) Reverse vaccinology   d) Reverse docking

9) The use of immunoinformatics tools can be useful to predict protein _____ and will become increasingly important in the screening of novel foods before in use.
   a) viral   b) effectiveness
   c) Allergenicty   d) infectious

10) _____ is a non-profit scientific and educational association that works to develop open standards for the exchange of biodiversity data, facilitating biodiversity informatics.
   a) Pfam
   b) TDWG
   c) Chembank
   d) Zinc

11) _____ is the part of an antigen that is recognized by the immune system, specifically by antibodies.
   a) Epitope
   b) antibody
   c) Epitome
   d) vaccine

12) _____ are terms that refer to the intersection of nanotechnology and biology.
   a) Biotechnology
   b) Molecular
   c) Nanobiotechnology
   d) Inhertiance

13) _____ chemical database is maintained by european bioinformatics institute.
   a) Zinc
   b) Chembank
   c) Pubchem
   d) ChEMBL

14) Ocean biogeographic _____ system is global open-access data and information clearing-house on marine biodiversity for science, conservation and sustainable development.
   a) Information
   b) Informal
   c) Inhouse
   d) India

Q.2 A) Answer the following questions. (Any Four)   08
   1) What is niche modeling?
   2) What is GWAS in personalized medicine?
   3) What is allergencity?
   4) What is carbon nanotube?
   5) What are GIS and GPS?

B) Write Short Notes on (Any Two)   06
   1) Explain chemical information source.
   2) Explain the future of computation modeling in clinical immunology.
   3) Explain the current biodiversity informatics projects.

Q.3 A) Answer the following questions. (Any Two)   08
   1) Write in detail about the types and applications of nanomaterials.
   2) Explain the Species2000 database in detail.
   3) Explain the steps of *in silico* vaccine designing in immunoinformatics.

B) Answer the following questions. (Any One)   06
   1) Explain the TDWG different standards and protocols of biodiversity informatics.
   2) Explain the Chebi and Zinc database.

Q.4 A) Answer the following questions. (Any Two)   10
   1) Explain different chemical structure representation in detail.
   2) Give a detailed account on biodiversity informatics.
   3) Explain the tools for prediction of SNP.

B) Answer the following questions. (Any One)   04
   1) Explain the different types tools for characterization of nanomaterials
   2) Explain the immunoinformatics overview and its applications.

Q.5 **Answer the following questions. (Any Two)** **14**
  a) Write in detail about the reverse vaccinology in immune disease.
  b) Write in detail as about the principles of phylogeny and taxonomy methods.
  c) Explain in detail about the different types of Chemical file format.