

Seat No.	
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**M. Sc. (Bioinformatics) (Semester –II) (New) (CBCS) Examination, 2017
ADVANCED BIOINFORAMTICS**

Day & Date: Wednesday, 19-04-2017

Max. Marks: 70

Time: 10.30 AM to 01.00 PM

- N.B. :**
- 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 –II are to be written in same answer booklet only.*

Section-I

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

- 1) _____ illustrate the relatedness of the leaf nodes without making assumptions about ancestry at all.
 - a) Super trees
 - b) Rooted trees
 - c) Unrooted trees
 - d) Both b and c
- 2) MP in phylogenetic refers to _____.
 - a) Multiple Parsimony
 - b) Maxim Parsimony
 - c) Maximum Parsimony
 - d) Maximum Phylogeny
- 3) PubMed and Medline are _____ library databases.
 - a) Visual Library
 - b) Vertebral Library
 - c) Virtual Library
 - d) All of these
- 4) _____ is a tool in EMBOSS which gives protein statistics
 - a) Showfeat
 - b) Infoseq
 - c) Pepstat
 - d) None of these
- 5) The PAM matrices were introduced by _____.
 - a) Margeret Dayhoff
 - b) Henikoff and Henikoff
 - c) Feng and Doolittle
 - d) None of these
- 6) PAUP stands for _____.
 - a) Protein Analysis Using Proteomics
 - b) Phylogenetic Analysis Using Parsimony
 - c) Phylip Analysis Using Parsimony
 - d) None of these
- 7) BLOSUM stands for _____.
 - a) Block Substitute Matrix
 - b) Block Substitution Matrix
 - c) Block Substituent Matrix
 - d) None of these

B) Definition

- 1) ExPASy
- 2) KEGG
- 3) PDB
- 4) PSI BLAST
- 5) BankIt
- 6) gap penalty
- 7) alpha helix

Section-II

Answer any four the following

- Q.2** Explain EMBOSS and its utilities and add a note on for what purpose EMBOSS is use? **14**
- Q.3** What is pairwise sequence alignment? Give a detailed description of Smith-Waterman algorithm? **14**
- Q4** Explain different type's identification of SNPs methods and a details account on SNP database **14**
- Q5** **Answer any two from the following** **14**
- a) Explain protein arrays, its basic principles and applications.
 - b) Explain MUMmer and suffix tree and add a note on comparative genomics.
 - c) Write a detailed note on Maximum parsimony method.
- Q.6** **Write short notes on (any two)** **14**
- a) Phylip
 - b) Gene prediction in Prokaryotes
 - c) KEGG

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**M.Sc. (Bioinformatics) (Semester – II) (New) (CBCS) Examination, 2017
MICROBIOLOGY AND BIOTECHNOLOGY**

Day & Date: Friday, 21-04-2017

Max. Marks: 70

Time: 10.30 AM to 01.00 PM

Instruction :-

- 1) Part-I, **Questions-1** is compulsory.
- 2) Attempt **any four** question 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-1

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

- 1) The bacterium grows in salt concentration is called _____.
a) Acidophiles b) Alkaliphiles c) Halophiles d) Xerophiles
- 2) _____ bacterial genome was synthesized artificially.
a) Mycoplasma b) E. coli c) Pseudomonas d) H1N1
- 3) Sanger's method of sequencing makes use of _____.
a) Oligonucleotide b) Deoxynucleotide
c) Dideoxynucleotide d) All of these
- 4) Molecular taxonomy is based on _____.
a) 28S rRNA b) 16S rRNA c) 30S rRNA d) 23S rRNA
- 5) The genetic material of virus is _____.
a) RNA b) DNA c) RNA or DNA d) Protein
- 6) Prions are basically made up of _____.
a) RNA b) Protein c) DNA d) Virus
- 7) _____ plasmid contains viral fragment.
a) Phagemid b) cosmid c) pBR322 d) pUC19

B) Definitions:

- 1) Ribosomes
- 2) Endonuclease
- 3) SV40
- 4) BACs

07

- 5) Probes
- 6) Domain of life
- 7) Growth kinetics

Section- II

Answer Any Four of the following:

- Q.2** Explain the general structure of prokaryotic cell with neat labeled diagram. **14**
- Q.3** Describe the structure and function of cloning vectors-pUC18 and pBR322. **14**
- Q.4** Explain the gene transfer in plant systems. **14**
- Q.5** **Answer any two from the following:** **14**
- a) Add a note on application of r-DNA technology in crop improvement.
 - b) Write a note on animal tissue culture media.
 - c) Explain the stages of growth curve.
- Q.6** **Write short notes on (any two)** **14**
- a) Electroporation
 - b) Structure of T4 bacteriophage
 - c) Bacterial conjugation

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**M.Sc. (Bioinformatics)(Semester – II) (New) (CBCS) Examination, 2017
BASIC BIOCHEMISTRY & IMMUNOLOGY**

Day & Date: Monday, 24-04-2017

Max. Marks: 70

Time: 10.30 AM to 01.00 PM

Instruction :- 1) Part-I, Questions 1 is compulsory.
2) Attempt **any four** question 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.

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

- 1) _____ is the main source of free energy in biological system.
a) Glucose b) Fatty acids c) ATP d) All
- 2) The basic components of lipids are _____.
a) Amino acids b) Vitamins c) Fatty acids d) glucose
- 3) Amino acids possessing both the charges are called _____.
a) Divalent ions b) Zwitter ions c) dipole ions d) None
- 4) _____ is structural polysaccharide.
a) Starch b) Cellulose c) Glycogen d) Sucrose
- 5) B cells are derived from _____ lineage.
a) Erythroid b) Myeloid c) Osteoid d) Leucoid
- 6) _____ is a secondary lymphoid organ.
a) Bursa of Fabricious b) Lymph node c) Thymus d) None
- 7) The surface marker present on T cell subsets are _____.
a) CD4 & CD8 b) CD12 & CD32
c) CD18 & CD24 d) All

B) Definitions: 07

1. Fatty acid
2. Polysaccharide
3. Vitamin D
4. IgA
5. Phagocyte
6. Cytokine
7. CMI

Section- II

Answer any four of the following

- Q.2** Explain different types of amino acids. **14**
- Q.3** Define Antibody. Explain its structure with a neat diagram. **14**
- Q.4** Write a detailed note on adaptive immunity. **14**
- Q.5** **Answer any two from the following:** **14**
- a) Add a note on types of proteins.
 - b) Write a note on functions of carbohydrates.
 - c) Explain different types of nucleic acids.
- Q.6** **Write short notes on (any two)** **14**
- a) Classification of lipids
 - b) Primary lymphoid organs
 - c) Autoimmunity

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**M.Sc. (Bioinformatics) (Semester-II) (New) (CBCS) Examination, 2017
Industrial and Environmental Biotechnology**

Day & Date: Monday, 24-04-2017

Max. Marks: 70

Time: 10.30 AM to 01.00 PM

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 Rewrite the sentence after choosing the correct answer from the given alternatives: 07

- 1) Stationary phase is described as
 - A) No further increase in the cell population after a maximum value
 - B) Deceleration of growth and division rate after the growth rate reaches a maximum
 - C) Acceleration of growth and division rate after the growth rate reaches a maximum
 - D) Deceleration of growth and division rate after the growth rate reaches a maximum
- 2) The number of baffles in a standard stirred tank bioreactor is
 - A) 8
 - B) 6
 - C) 4
 - D) 2
- 3) The specific growth rate is affected by
 - A) Substrate concentration
 - B) Product concentration
 - C) Oxygen supply
 - D) All of these
- 4) Bioreactors are used for
 - A) Large scale production of desired substances by using cells/microbes
 - B) Kill bacteria
 - C) To Store viruses
 - D) To get Chemicals

- 5) Out of following..... is an example of non-conventional energy sources.
- | | |
|------------------|----------------|
| A) Petroleum oil | B) Sunlight |
| C) Coal | D) Natural gas |
- 6) Dendrotheraml energy is included in type of energy source.
- | | |
|------------------|---------------|
| A) Conventional | B) Renewable |
| C) Non-renewable | D) Both A & C |
- 7) The forest conservation act was passed in by Indian parliament
- | | |
|---------|---------|
| A) 1988 | B) 1980 |
| C) 1981 | D) 1972 |

B) Definitions

07

- 1) Secondary metabolites
- 2) Stationary Phase
- 3) Immobilization
- 4) Spargers
- 5) Environmental ethics
- 6) Biosensor
- 7) Bio Sorption

PART - II

Answer any four of the following

- | | | |
|-----------|--|-----------|
| Q2 | Explain about isolation of Microorganism and note on Microbial growth phases | 14 |
| Q3 | Define Biosensor? Note with examples and its application | 14 |
| Q4 | Describe about the environment protection and conservation | 14 |
| Q5 | Answer any two of the following | 14 |
| | A) Methods of Preservation of microorganism | |
| | B) Continuous fermentation | |
| | C) Streptomycin production | |
| Q6 | Answer any two of the following | 14 |
| | A) Methods for cell lysis | |
| | B) Physical and chemical methods for effluent treatment | |
| | C) Non-conventional energy sources | |

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**BIOINFORMATICS (Semester – IV) (New) (CBCS) Examination, 2017
BIOLOGICAL SIMULATION AND MODELING**

Day & Date: Wednesday, 19-04-2017

Max. Marks: 70

Time: 02.30 PM to 05.00 PM

- N.B. :** 1) **Section-I, Question 1 is Compulsory.**
 2) Figures to the **right** indicate **full** marks.
 3) Attempt **Any Four** questions from **Section –II**
 4) Answers to the **Section-I and Section –II** are to be written in same answer Booklet only.

Section -1

Q.1 A) Select appropriate word: 07

- 1) Python is _____ types of language.
 - a) Dynamic
 - b) Semi-dynamic
 - c) Static
 - d) None of these
- 2) The _____ function creates a Python file object.
 - a) Fopen()
 - b) Open()
 - c) Fileopen()
 - d) None of these
- 3) $x = 4.5$ $y = 2$ print x/y ? what will be the output
 - a) 2.0
 - b) 10.0
 - c) 5.0
 - d) 1.0
- 4) The first in simulation is _____
 - a) Calculation
 - b) Processing
 - c) Model building
 - d) All
- 5) _____ is a base of any simulation.
 - a) Statistics
 - b) Mathematics
 - c) Physics
 - d) Chemistry
- 6) MD in simulation stands for _____
 - a) Microbial Dynamics
 - b) Macroscopic Dynamics
 - c) Molecular Dynamics
 - d) None
- 7) The first protein simulated was _____
 - a) Insulin
 - b) Trypsin inhibitor
 - c) Polymerase
 - d) Protease

B) Definitions 07

- 1) Python
- 2) Dynamic
- 3) Static
- 4) Class
- 5) System
- 6) SIR
- 7) Energy

Section-II

- Answer any four of the following** **14**
- Q.2** Explain string functions in python with example.
- Q.3** Explain working with python **14**
- Q.4** Write a note on principle applications of simulations **14**
- Q.5** **Answer any two form the following** **14**
- 1) Write a note simulation Softwares
 - 2) Explain python editor in details
 - 3) Add a note on Molecular mechanics
- Q.6** **Write short notes on (Any two)** **14**
- 1) Biological simulations
 - 2) Functions in python
 - 3) Examples of molecular dynamics

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**M. Sc. Bioinformatics (Semester – IV) (New) (CBCS) Examination, 2017
CLINICAL BIOINFORMATICS**

Day & Date: Friday, 21-04-2017

Max. Marks: 70

Time: 02.30 PM to 05.00 PM

- N.B. :** 1) Section-I, Question 1 is compulsory.
 2) Attempt **any four** 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) _____ is also called whole transcriptome shotgun sequencing.
 a) RNA Seq b) Chlp c) FAST A d) Transcriptomic
- 2) Peptic ulcers is caused by _____
 a) *E.coli* b) Helicobacter pylori c) HIV d) Fungus
- 3) _____ to prepares a standardized bill for service given to patient.
 a) Payer b) Provider c) Occupational d) Client
- 4) _____ A fast quality control toolkit Illuminia sequencing data.
 a) Pyroclenar b) FAST X c) PrinSek d) HTQC
- 5) Cancer is caused by _____
 a) Hepatitis b) HIV
 c) Human papilloma virus d) All of these
- 6) _____ is a genome browser for vertebrate genomes.
 a) Google b) Ensembl c) PubMed d) NIH
- 7) Pharamcovigilance also called as drug _____.
 a) Safety b) Administration
 c) Barrier d) Assessment

B) Definitions. 07

- 1) Cystic fibrosis
- 2) ADR
- 3) Mapviewer.
- 4) NGS library
- 5) SNPdb
- 6) BAM

Section - II

Answer any four of the following.

- Q.2** Explain in detail about types of Cancer. **14**
- Q.3** Explain quality control tool for Next generation sequencing data in details and add a note on challenges for bioinformatics in NGS details. **14**
- Q.4** Genome data visualization using Ensemble and Map viewer. **14**
- Q.5** **Answer any two from the following.** **14**
- 1) Explain Basic NGS chemistry in details.
 - 2) Describe pathogen genomes.
 - 3) Explain transcriptomics in details.
- Q.6** **Write short notes on (any two)** **14**
- 1) System Biology
 - 2) Application of Pharamcovigilance
 - 3) Challenges of HGP.

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**M.Sc. Bioinformatics (Semester-IV) (New) (CBCS) Examination, 2017
ADVANCED MOLECULAR BIOLOGY**

Day & Date: Monday, 24-04-2017

Max. Marks: 70

Time: 02.30 PM to 05.00 PM

- N.B. :**
- 1) Part-1, Question 1 is **compulsory**.
 - 2) Attempt **any four** questions from **part-II**.
 - 3) Figures to the **right** indicate **full** marks.
 - 4) Attempts **any two** questions from Q.5 to Q.7.
 - 5) Answers 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 give alternatives: 07

- 1) Western Blotting is used for _____.
 - a) DNA
 - b) Protein
 - c) RNA
 - d) Both a & b
- 2) _____ tool is used to analyze peptide mass fingerprint.
 - a) Mass spectroscopy
 - b) MASCOT
 - c) ExPassy
 - d) All
- 3) Molecular based diagnosis is done using _____ instrument.
 - a) FTIR
 - b) PCR
 - c) UV-VIS
 - d) All
- 4) Localization of gene in cell or tissue _____ technique is used.
 - a) In vitro
 - b) In Vivo
 - c) In Situ
 - d) All
- 5) _____ technique is used to separate proteins in its native from.
 - a) SDS PAGE
 - b) Native PAGE
 - c) IEF
 - d) 2D PAGE
- 6) _____ technique is used to identify recombinant phages.
 - a) In situ hybridizatio
 - b) Colony hybridization
 - c) Plaques hybridization
 - d) None
- 7) _____ Molecular marker is used to study the polymorphism in genetic material using PCR.
 - a) Western Blot
 - b) RAPD
 - c) RFLP
 - d) Both b & C

- B) Answer the following** **07**
- 1) Molecular Markers
 - 2) Nitrocellulose membrane
 - 3) Dansyl chloride
 - 4) Dialysis
 - 5) Plaque Hybridization
 - 6) Microarray
 - 7) Autoradiography

PART-II

- Q.2** Explain the Primer designing parameters using Oligo 4 software. **14**
- Q.3** Explain in detail the instrumentation and applications of HPLC and GLC. **14**
- Q.4** Explain protein sequencing by Edman degradation method. **14**
- Q.5** **Answer any two of the following.** **14**
- a) Describe variable number tandem repeat (VNTR).
 - b) Write a note on affinity chromatography with neat labeled diagram.
 - c) Describe 2D gel electrophoresis.
- Q.6** **Short notes (Any two):** **14**
- a) SNP
 - b) cDNA Library
 - c) Site Directed Mutagenesis.

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**M.Sc. Bioinformatics (Semester – IV) (New CBCS) Examination, 2017
EMERGING AREAS OF BIOINFORMATICS**

Day & Date: Wednesday, 26-04-2017

Max. Marks: 70

Time: 02.30 PM to 05.00 PM

- N.B. :** 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

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

- 1) ChEMBL is maintained by _____.
- a) EBI b) NCBI c) SIB d) ExPasy
- 2) _____ means to communicate the molecular graph to and from the computer.
- a) Linear notation b) Connection table
c) SMILES d) MOL
- 3) IMGT/HLA database is present in _____
- a) NCBI b) DDBJ c) EMBL d) DNAS
- 4) _____ is the immunogenic database.
- a) IMGT b) IPD c) IT IS d) All
- 5) Every submitted variation receives a submitted SNPID is _____
- a) SS# b) # c) SS d) S#
- 6) OBIS is _____.
- a) Ocean biology information system
b) Ocean biogeographic information system
c) Ocean biogeographic initiative system
d) Ocean biology initiative system
- 7) _____ first used the term nanotechnology.
- a) Richard Feynman b) Norio Taniguchi
c) Eric Drexler d) Sumio Iijima

B) Definition 07

- 1) IMGT
2) 3D compounds
3) SIFT
4) Top Down approach
5) dbSNP
6) SDF
7) GBIF

Section - II

Answer any four of the following.

- Q.2** Explain the different chemical database and add a note on SMILES notation in details. **14**
- Q.3** Give a detailed account on immunoinformatics and explain the bioinformatics strategies for better understanding of immune function. **14**
- Q.4** Explain the brief principles of Taxonomy and add a note on phylogeny in biodiversity informatics. **14**
- Q.5** **Answer any two from the following.** **14**
- 1) Explain SNP and its application in details.
 - 2) Describe the Properties of nanoparticles.
 - 3) Explain Chemical structure representation.
- Q.6** **Write short notes on (any two)** **14**
- 1) FTIR
 - 2) MOL file format
 - 3) TDWG

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M.Sc. (Bioinformatics) (Semester-IV) (New) (CBCS) Examination, 2017
MOLECULAR MEDICINE

Day & Date: Wednesday, 26-04-2017

Max. Marks: 70

Time: 02.30 PM to 05.00 PM

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

SECTION – I

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

- 1) In DNA fingerprinting _____ repeated sequences of DNA is used.
 - a) Variable number of tandem repeats
 - b) Verified number of tandem repeat
 - c) Versatile number of transverse repeat
 - d) Variable number of transverse repeat
- 2) Stem cell exhibits _____ properties.
 - a) Only potency
 - b) Potency and self renewable
 - c) Potency and non renewable
 - d) Only self-renewable
- 3) MHC Antigen in mouse is known as _____.
 - a) HLA
 - b) H-2
 - c) ASB
 - d) HSB
- 4) The α -globin gene of haemoglobin is located on chromosome number _____.
 - a) 11
 - b) 12
 - c) 16
 - d) 18
- 5) _____ Gene is mutated in cystic fibrosis.
 - a) CFTR
 - b) Actin
 - c) Cadherin
 - d) Fibrin
- 6) Stem cell exhibits _____ properties.
 - a) Only potency
 - b) Potency and self renewable
 - c) Potency and non renewable
 - d) Only self-renewable
- 7) Hematopoietic stem cells are _____.
 - a) Pluripotent
 - b) Totipotent
 - c) Unipotent
 - d) Oligopotent.

- B) Define the terms:** **07**
- 1) Totipotency
 - 2) Recombination
 - 3) Amniocentesis
 - 4) DNA fingerprinting
 - 5) Microarray.
 - 6) Plasmids
 - 7) Sickle cell anemia

SECTION – II

Answer any four of the following:

- Q.2** Write a brief account on Stem cells and its properties. **14**
- Q.3** Explain in detail Cystic fibrosis with labeled diagram. **14**
- Q.4** Explain in detail steps involved in during discovery and its design. **14**
- Q.5** **Answer any two of the following** **14**
- A)** Give an account on Huntington's disease.
 - B)** Explain different nature and sources of drug.
 - C)** Explain in brief human genome project.
- Q.6** **Write Short notes on any TWO of the following** **14**
- A)** Write a note on induced pluripotent stem cells.
 - B)** Describe Alzheimer's disease.
 - C)** Explain in-vivo and ex-vivo gene therapy.