

Master of Science – I (Biotechnology) Examination: Oct / Nov 2016
Semester – I (New CBCS)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR-SK - 93	Wednesday 16/11/2016	10.30 AM to 01.00 PM	Microbiology	HCT 1.1	

Instructions: 1) Section-I is compulsory.
2) Answer any four questions from Section-II

Total Marks: 70

Section I

Q.1 (a) Multiple Choice Questions

07

- 1) The foundation for the germ theory of disease was set down by
 - a) Robert Koch
 - b) Ronald Ross
 - c) Louis Pasteur
 - d) Walter Reed

- 2) Mycoplasmas are different from the other prokaryotes by
 - a) presence of chitin in cell walls
 - b) presence of murrain in cell walls
 - c) presence of proteins in cell walls
 - d) absence of cell wall itself

- 3) Culture medium used for fungus is
 - a) Sabouraud's medium
 - b) Nutrient broth
 - c) Nutrient broth
 - d) Minimal agar

- 4) The bacteria which are able to grow at 0°C but which grow at 20°C to 30°C also, are known as
 - a) Psychrophiles
 - b) Facultative psychrophiles
 - c) Average psychrophiles
 - d) Mesophiles

- 5) Example for DNA viruses:
 - a) Adeno virus
 - b) Papova virus
 - c) Herpes virus and cauliflower moisaic
 - d) All of the above

- 6) Penicilin is commercially produced by
 - a) P. notatum
 - b) P. chrysogenum
 - c) P. citrinum
 - d) P. roquefortii

- 7) Ziehl- Neelson stain is a _____
 - a) Simple stain
 - b) Counter stain
 - c) Differential stain
 - d) None of them

B) Define the following terms:

07

- 1) Pili
- 2) Pasteurisation
- 3) Barophiles
- 4) Archaeobacteria
- 5) Cyanobacteria
- 6) Bacteriophage
- 7) Axenic culture

Section II

- Q.2** How are the prokaryotes classified? Add a note on the present used method of classifying the Bacteria. **14**
- Q.3** What is antagonism? What is its influence in discovery of antibiotics? **14**
- Q.4** Explain what is numerical taxonomy? How does it influence the classification of biological systems? **14**
- Q.5** **Answers any two of the following:** **14**
- a) What are the physical methods of sterilization?
 - b) What is Bergy's Manual? What is its significance on biological classification?
 - c) Explain symbiotic associations with suitable examples.
- Q.6** **Write short notes on any two of the following** **14**
- a) Egg inoculation
 - b) Differential staining
 - c) Preservation of cultures

B) Definitions:	07
1) Uncoupler	
2) Metabolism	
3) Secondary messenger	
4) Biological energy transducer	
5) Redox potential	
6) Photophosphorylation	
7) Hormone	

Section II

Q.2	Describe in detail 'oxidative phosphorylation'.	14
Q.3	Add a detail account on 'Inborn errors of metabolism'.	14
Q.4	Describe the reactions and regulation of 'glycolysis'.	14
Q.5	Answers any two from the following:	14
	a) Explain structure and role of cAMP.	
	b) Illustrate biosynthesis of fatty acids.	
	c) Describe 'dark reactions' of photosynthesis.	
Q.6	Answers any two from the following:	14
	a) Describe pancreatic hormones.	
	b) Describe structural levels in protein. Add a note 'Ramchandran plot'	
	c) Write note on 'redox potential.'	

B) Define the following:

07

- 1) Law of Independent Assortment
- 2) Epistasis
- 3) Gene Flow
- 4) Analogous Organs
- 5) Transformation
- 6) Pericentric Inversion
- 7) Position Effects

Part - II

Answer Any Four of the following.

- Q.2** Write in detail about the Mendelian Law's of Inheritance with example. **14**
- Q.3** Describe in detail about the morphology of Chromosome and its Role in Heredity with a neat labeled diagram. **14**
- Q.4** Which a neat labeled diagram, write a note on Griffith's Experiment and the mechanism of transformation. **14**
- Q.5** **Answers any two from the following:** **14**
- a) Write in brief about Neodarwinism
 - b) Write in brief about Generalized Transduction
 - c) Write in brief about supplementary Gene Action
- Q.6** **Write short notes on any two:** **14**
- a) Microsatellite
 - b) Competency and various factors affecting competency
 - c) Extra chromosomal Inheritance in chloroplast

**Master of Science – I (Biotechnology) Examination: Oct/Nov 2016
Semester – I (New CBCS)**

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SK - 96	Wednesday 23/11/2016	10.30 AM to 01.00 PM	Biostatistics & Bioinformatics	SCT 1.1	

- Instructions:**
- 1) Part-I Question- 1 is compulsory.
 - 2) Answer 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 the same answer booklet only.

Total Marks: 70

Part – I

Q.1 A) Rewrite the following sentences by selecting correct answers from given alternative. 07

- 1) _____ is one of the genome information resource

a) NCBI	b) PIR
c) SIB	d) RCSB

- 2) The secondary database of protein is _____.

a) Swiss prot	b) TrEmbl
c) Blocks	d) PDB

- 3) FASTA was developed by _____.

a) Needleman & Wunch	b) Smith & Waterman
c) Lipman & Pearson	d) None

- 4) _____ is one of the protein secondary structure

a) helix	b) turn
c) sheet	d) All

- 5) A subset of the population selected to help make inferences on a population is called _____.

a) population	b) inferential statistics
c) census	d) sample

- 6) Which of the following is not a measure of central tendency?

a) Mode	b) variability
c) median	d) mean

- 7) It is necessary to find cumulative frequencies in order to draw _____.

a) histogram	b) frequency polygon
c) ogive curve	d) column chart

B) Define the following:

07

- 1) Proteome
- 2) Alignment
- 3) Homology
- 4) Biostatistics
- 5) Variable
- 6) Median
- 7) Chi square test

Part –II

Answer Any Four of the following.

- Q.2** Write a note on Genome Information Resources. **14**
- Q.3** Add a note on structural databases of proteins. **14**
- Q.4** Explain the application of statistics in biology with example. **14**
- Q.5** **Answers any two from the following:** **14**
- a) Write a note on pairwise sequence alignment
 - b) Add a note on Phylogenetics analysis software's
 - c) Calculate Quartile deviation from the data 11, 12, 20, 16, 18, 30, 44, 40, 50, 46, 62.
- Q.6** **Answer any two:** **14**
- a) What is Protein structure prediction?
 - b) What is coefficient of variance? Mention its importance.
 - c) Graphical representation of data.

**Master of Science – I (Biotechnology) Examination: Oct / Nov 2016
Semester – I (New CBCS)**

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SK - 97	Wednesday 23/11/2016	10.30 AM to 01.00 PM	Clinical Bioinformatics	SCT 1.2	

- Instructions:**
- 1) Part-I Question- 1 is compulsory.
 - 2) Answer 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 the same answer booklet only.

Total Marks: 70

Part – I

Q.1 A) Rewrite the following sentences by selecting correct answers from given alternative. 07

- 1) _____ also known as drug safety is the pharmacological science relating to the collection, detection, assessment, monitoring, and prevention of adverse effects with pharmaceutical products.
 - a) Clinical trial
 - b) Pharmacovigilance
 - c) CDM
 - d) Pharamcology

- 2) _____ is an affordable mapping and spatial analysis tool that allows you to easily produce publication-quality thematic maps
 - a) Microarray
 - b) Map Viewer
 - c) Ensemble
 - d) GEO

- 3) CPT is a registered trademark of the _____ Medical Association.
 - a) American
 - b) Indian
 - c) Australian
 - d) All of above

- 4) Computation approaches for predication of pathogen-hot protein-protein interactions is _____
 - a) Motif
 - b) Domain
 - c) Homology
 - d) All

- 5) _____ resource provides viral and viroid genome sequence data and related information.
 - a) ViPR
 - b) Ensemble
 - c) dbSNP
 - d) OMIM

- 6) _____ can be used to filter, reformat, or trim your genomic and metagenomic sequence data.
 - a) HTQC
 - b) QPLOT
 - c) PRINSEQ
 - d) FASTX

- 7) R is an _____ language; users typically access it through a command-line interpreter.
 - a) Object oriented
 - b) Structure oriented
 - c) interpreted
 - d) All

B) Definitions:

07

- 1) NGS
- 2) Genome Mapping
- 3) parasitic diseases
- 4) Pharmacovigilance
- 5) Meatabolome
- 6) Comparative genomics
- 7) R scripting

Part –II

Answer Any Four of the following

- Q.2** Write in details various methods of NGS. **14**
- Q.3** Explain different types of host pathogen interactions. **14**
- Q.4** Define clinical trial. Add a note on different stages. **14**
- Q.5** **Answers any two from the following:** **14**
- a) Add a note on pharmacogenomics.
 - b) Write a note systems biology.
 - c) Explain the Human Genome Project.
- Q.6** **Write short notes on any two:** **14**
- a) Application of metabolomics
 - b) Ensemble and Mapviewer
 - c) Medical coding

Section–II

- Q.2** Give a brief account of photosynthetic bacteria. **14**
- Q.3** Write in detail about different methods to control micro-organism. **14**
- Q.4** Describe lytic cycle of viruses by using the examples of T₄ phage and ΦX174 phage. **14**
- Q.5** **Write shorts notes any TWO of the following:** **14**
- a) Give the difference between dry heat sterilization and moist heat sterilization
 - b) Scanning electron microscopy
 - c) Halophiles
- Q.6** **Write short notes on any TWO of the following:** **14**
- a) PHYLIP Software
 - b) Magnetotactic bacteria
 - c) Multiplication of Influenza virus.

B) Define the following terms:

07

- 1) Glycolysis
- 2) Phosphorylation
- 3) Respiration
- 4) β -Oxidation
- 5) Catabolism
- 6) Spermatogenesis
- 7) Ligand

Section-II

- Q.2** Explain C3 pathway involved in dark reaction of photosynthesis. Add a note on Rubisco enzyme. **14**
- Q.3** What are the phytohormones? Explain in details synthesis, transportation, and physiological role of Auxin. **14**
- Q.4** Describe in detail enzymatic steps involved in glycolysis. Add a note on it's energetic. **14**
- Q.5 Answer any TWO of the following:** **14**
- a) Explain different types of DNA. Explain Why B form of DNA is common.
 - b) Explain the Gluconeogenesis pathway
 - c) Explain Light Reaction involved in Photosynthesis
- Q.6 Write short notes on any TWO of the following:** **14**
- a) C4 pathway
 - b) Intracellular Receptors
 - c) Redox potential and Phosphorylation potential

**Master of Science – I (Biotechnology) Examination: Oct/Nov 2016
Semester – I (Old CBCS)**

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SK – 100	Monday 21/11/2016	10.30 AM to 01.00 PM	Inheritance Biology	III	

Instructions: 1) Section -I is compulsory.
2) Answer any four questions from Section -II

Total Marks: 70

Section– I

Q.1 A) Rewrite the following sentences by selecting correct answers from given alternative. 07

- 1) Different forms of a gene that exist within a population are termed as ____
 - a) Pairs
 - b) Alleles
 - c) Hybrides
 - d) Genotype

- 2) Balbiani rings are found in _____ Chromosomes.
 - a) Polytene
 - b) Lampbrush
 - c) Cytoplasmic
 - d) Heterozygous

- 3) In bacterial conjugation _____ is carried by the male or the donor strain.
 - a) H-factor
 - b) C-factor
 - c) F-factor
 - d) T-factor

- 4) The merger of Darwinian theory and population genetics is termed as _____.
 - a) Hardy Weinberg equilibrium
 - b) Neodarwinism
 - c) Speciation
 - d) Allelism

- 5) LINES and SINES are the nonviral retrotransposons found in _____.
 - a) Invertebrates
 - b) Protozoa
 - c) Bacteria
 - d) Vertebrates
 - e)

- 6) _____ involves changes in whole set of chromosomes.
 - a) Aneuploidy
 - b) Euploidy
 - c) Trisomy
 - d) Monosomy

- 7) _____ discovered that E.coli cells can exchange genetic material through the process of Conjugation
 - a) Zinder, Lederberg
 - b) Lederberg, Tatum
 - c) Mendel
 - d) Morgan

B) Define the following terms:

07

- 1) Allele
- 2) Aneuploidy
- 3) Transformation
- 4) Genetic polymorphism
- 5) C-value
- 6) Genetic Linkage
- 7) Inheritance

Section-II

- Q.2** Explain why Mendel used pea plant as an experimental material. **14**
- Q.3** What are chromosomal aberrations? Comment on its types. **14**
- Q.4** Write a note on the types of transduction method for gene transfer. **14**
- Q.5** **Answer any TWO of the following:** **14**
- a) What is population genetics? Write its significance.
 - b) Write a note on the SINES and its relationship with Alu sequences.
 - c) What is gene mapping? Explain.
- Q.6** **Write shorts note on any TWO of the following:** **14**
- a) Neo-Darwinism.
 - b) Gene transfer methods.
 - c) Lampbrush chromosome.

**Master of Science – I (Biotechnology) Examination: Oct / Nov 2016
Semester – I (Old CBCS)**

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SK - 101	Wednesday 23/11/2016	10.30 AM to 01.00 PM	Biostatistics & Bioinformatics	IV	

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

Total Marks: 70

Part– I

Q.1 A) Rewrite the following sentences by selecting correct answers from given alternative. 07

- 1) _____ is one of the protein information resource.

a) NCBI	b) PIR
c) DDBJ	d) EBI

- 2) The primary database of protein is _____

a) Swiss prot	b) TrEmbl
c) Both a & b	d) None

- 3) BLAST is _____ sequence alignment tool

a) Multiple	b) pairwise
c) both & b	d) None

- 4) _____ is one of the homology modeling method

a) Parsimony	b) likelihood
c) neighbor joining	d) All

- 5) A set all possible data values for a subject under consideration is called _____

a) descriptive statistics	b) a sample
c) a population	d) statistics

- 6) The number of occurrences of a data value is called _____

a) The class limits	b) The frequency
c) The cumulative frequency	d) Ogive

- 7) An organization of observed data into tabular form in which classes and frequencies are used is called _____.

a) the bar chart	b) the pie chart
c) the histogram	d) frequency polygon

B) Definitions:**07**

- 1) Genome
- 2) MSA
- 3) Global alignment
- 4) Constant
- 5) Mean
- 6) Histogram
- 7) Population

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

- Q.2** Write a note on nucleotide sequence databases. **14**
- Q.3** Add a note on methods of sequence alignment. **14**
- Q.4** Define table. Explain the components of table. **14**
- Q.5 Answer any TWO of the following:** **14**
- a) Write a note on composite databases.
 - b) Add a note on homology modeling.
 - c) Obtain median for the following data

Marks	20	9	25	50	80	40
No. of students	6	4	16	7	2	8

- Q.6 Write shorts note on any TWO of the following:** **14**
- a) Application of phylogenetic
 - b) Advantages & disadvantages of standard deviation
 - c) Types of distribution in probability.

Master of Science – I (Biotechnology) Examination: Oct/Nov 2016
Semester – II (New CBCS)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SK – 102	Thursday 17/11/2016	10.30 AM to 01.00 PM	Cell Biology	V	

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

Total Marks: 70

Section – I

Q.1 A) Rewrite the following sentences by selecting correct answers from given alternative. 07

- 1) The main function of Centrosome is
 - a) Secretion
 - b) Osmoregulation
 - c) Protein Synthesis
 - d) Formation of Spindle fiber
- 2) _____ is a type of adhering junction between animal cells
 - a) Tight junction
 - b) Gap junction
 - c) ATP
 - d) GTP
- 3) The first men to observe live cell under microscope was
 - a) Robert Hooke
 - b) Leeuwenhoek
 - c) Schleiden
 - d) Virchow
- 4) The nucleus was first described by
 - a) Robert Brown
 - b) Robert Hooke
 - c) Weismann
 - d) Nageli
- 5) Cell theory was proposed by
 - a) Beadle and Tatum
 - b) Robert Hooke
 - c) Schleiden and Schwann
 - d) Leeuwenhoek
- 6) Protoplasm found inside the nucleus is known as
 - a) Amyloplast
 - b) Nucleopalsm
 - c) Cytoplasm
 - d) Elaioplast
- 7) Plasmodesmata occurs in ----
 - a) Plants
 - b) Animals
 - c) Bacteria
 - d) All of the above

B) Define the following terms:

07

- 1) Cell Theory
- 2) Cell-Cell Interaction
- 3) Blastulation
- 4) Mitosis
- 5) Lysosomes
- 6) Desmosomes
- 7) Integrins

Section – II

Answer any four of the following

- Q.2** Explain Cell Adhesion Molecules (CAMs) with suitable example and working principle. **14**
- Q.3** Add a note on Structure, working of Motor protein with suitable example. **14**
- Q.4** Add a brief note on structural organizations of eukaryotic cells. **14**
- Q.5** **Answer any TWO of the following:** **14**
- a) Cell cycle
 - b) Structural organization and functions of Mitochondria and chloroplast
 - c) Secondary messenger
- Q.6** **Write shorts note on any TWO of the following:** **14**
- a) Embryonic development in frog
 - b) Role of IP₃ and calcium in Voltage gated channels
 - c) Hormones and growth factors in Cell differentiation

B) Define the following terms:

07

- 1) Specific activity
- 2) Ribozyme
- 3) Transition state
- 4) Enzyme engineering
- 5) Steady state enzyme kinetics
- 6) Active site
- 7) Modulators

Section–II

- Q.2** Illustrate the factors affecting catalytic efficiency of enzymes. Add a note on ribozyme. **14**
- Q.3** Write an essay on metabolic engineering. **14**
- Q.4** Explain in detail structure function relationship of enzyme Na⁺K⁺ ATPase. **14**
- Q.5** Describe various types of inhibition with their kinetics. **14**
- Q.6** **Answer any TWO of the following:** **14**
- a) Explain in detail structure function relationship of enzyme Aspartate Transcarbamylase
 - b) Derive Line Michaelis Menten equation. Add a note on signification of Km and Vmax.
 - c) Explain Line weaver Burk plot. Add a note on Characteristics of enzymes.
 - d) Explain Scat chard plot. Add a note on enzyme repression.

**Master of Science – I (Biotechnology) Examination: Oct / Nov 2016
Semester – II (New CBCS)**

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SK - 104	Tuesday 22/11/2016	10.30 AM To 01.00 PM	Molecular Cell Processing	VII	

- Instructions:**
- 1) Section- I compulsory.
 - 2) Answer 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 the same answer book.

Total Marks: 70

Section– I

Q.1 A) Rewrite the following sentences by selecting correct answers from given alternative. 07

- 1) _____ statement is true of DNA damage.

a) Most DNA damage is repaired by the cell.	b) All DNA damage results in diseases as cancer
c) All DNA damages is caused by physical, chemical or biological agents	d) Most DNA damage is advantages to the cell

- 2) One complete helical turn of Z form of DNA has _____ nucleotides.

a) 9	b) 10
c) 11	d) 12

- 3) _____ histone protein seals the nucleosome.

a) H1	b) H2A
c) H2B	d) None of these

- 4) Lactose operon has _____ structural genes.

a) Lac z, Lac y, Lac-a	b) Lac z, Lac c, Lac-y
c) Lac x, Lac y, Lac-Z	d) Lac z, Lac y, Lac-b

- 5) The first step in translation is _____.

a) Transfer of amino acid	b) Initiation of synthesis to t-RNA
c) Activation amino acid	d) None of these

- 6) _____ site on DNA is responsible for binding of enzyme RNA polymerase during transcription process.

a) Operator	b) Promoter
c) Regulator	d) Enhancer

- 7) The type of mutation most commonly associated with exposure to UV light is _____.

a) Thymine dimerization	b) Base deamination
c) Depurination	d) Base deletion

B) Define the following terms:

07

- 1) Okazaki fragments
- 2) Primary transcript
- 3) Replication fork
- 4) Cot curve
- 5) Replicon
- 6) Solenoid
- 7) Heterochromatin

Section-II

- Q.2** Explain in detail about replication in prokaryotes and DNA proof reading with a neat labeled diagram. **14**
- Q.3** Write a note on base excision and recombination repair with a neat labeled diagram. **14**
- Q.4** Describe the process of translation in prokaryotes and add a note on inhibitors of translation. **14**
- Q.5** Explain in detail packing and organization of eukaryotic genome with a neat labeled diagram. **14**
- Q.6** **Answer any TWO from the following:** **14**
- a) Explain about Cot curve.
 - b) Write a note on different types of RNA.
 - c) Write about holiday model of recombination.

B) Definitions:

07

- 1) Give difference between primary and secondary immune response.
- 2) Define Apoptosis and necrosis
- 3) Give functions of cytokines
- 4) Define anaphylaxis and atopy
- 5) Isograft and allograft
- 6) Give examples of Live attenuated and killed vaccines
- 7) Give types of antigens.

Part-II

Answer any four of the following.

- Q.2** Write an account on mechanism of autoimmunity. **14**
- Q.3** Write an account on mechanism of T cell mediated immunity. **14**
- Q.4** Explain cytosolic pathway of antigen processing and presentation. **14**
- Q.5 Answer any TWO :** **14**
- a) Structure and function of MHC I molecule.
 - b) Explain Radioimmunoassay and Immunofluorescence test.
 - c) General structure, cultural characters, life cycle, pathogenicity, laboratory diagnosis prophylaxis of Influenza virus.
- Q.6 Answer any TWO :** **14**
- d) Immunological basics of graft rejection
 - e) Explain secondary Lymphoid organs with its function.
 - f) Explain mechanism of tumor evasion of immune system.

B) Definitions:

07

- 1) Lysosome
- 2) Cilia
- 3) Vesicle
- 4) Kinesin
- 5) Cyclin
- 6) G-protein
- 7) Integrin

Part – II

Answer any four of the following.

- Q.2** Write a note on different models of cell membrane. **14**
- Q.3** Explain in detail the structural organization of prokaryotic cell. **14**
- Q.4** Define microfilament. Add a note on its structure and function. **14**
- Q.5** What is cell cycle? Write a note on phases of cell cycle. **14**
- Q.6 Answer any TWO :** **14**
- a) Write a note on cell interaction.
 - b) Write a note on cell adhesion and extracellular matrix
 - c) Explain the passive transport.
- Q.7 Write sorts notes any TWO :** **14**
- a) Ribosomes
 - b) Animal cell
 - c) Actin and myosin

Section-II

Answer Any Four

- Q.2** Write an essay on factors affecting catalytic efficiency of enzyme. **14**
- Q.3** Describe bisubstrate reactions with their types and kinetics. **14**
- Q.4** Illustrate the protein ligand interactions with quantitative measurement. **14**
- Q.5** What is immobilization? Give various methods and industrial application of it. **14**
- Q.6 Answer any TWO of the following:** **14**
- a) Give an account of isozymes.
 - b) Derive an equation of Michaelis -Menten for unisubstrate reaction of enzyme.
 - c) Illustrate the structure and function relationship of lysozyme.
- Q.7 Answer any TWO of the following:** **14**
- a) Write a note on glucose oxidase as biosensor.
 - b) Explain the allosteric regulation of enzyme.
 - c) Discuss the structure and function relationship of trypsin.

**Master of Science – I (Biotechnology) Examination: Oct/Nov 2016
Semester – II (Old CBCS)**

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SK - 108	Tuesday 22/11/2016	10.30 AM To 01.00 PM	Molecular Cell Processing	III	

- Instructions:**
- 1) Section I is compulsory.
 - 2) Answer any four questions from Section –II.
 - 3) All question carry equal marks.
 - 4) Figures to right indicate full marks.
 - 5) Draw neat and labeled diagrams.

Total Marks: 70

Section– I

Q.1 A) Rewrite the following sentences by selecting correct answers from given alternative. 07

- 1) _____ statement is true of DNA damage.

a) Most DNA damage is repaired by the cell	b) All DNA damage result in diseases such as cancer
c) All DNA damage is caused by physical agents	d) Most DNA damage is advantageous to the cell

- 2) RNA primer necessary for DNA replication _____

a) The RNA prime is necessary for the activity of DNA ligase.	b) The RNA primer creates the 5' and 3' ends of the strand
c) DNA polymerase can only add nucleotides to RNA molecules	d) DNA polymerase can only add nucleotides to an existing strand.

- 3) The common demonization occurs during DNA damage _____

a) Thymine dimer	b) Adenine dimer
c) Guanine dimer	d) None

- 4) During the process of transcription, _____ of the following is produced

a) H ₂ O	b) ATP
c) mRNA	d) DNA

- 5) DNA repair mechanism is absent in _____

a) Nuclear genome	b) Mitochondrial genome
c) Chloroplast genome	d) Both b & c

- 6) The peptide chain grows on _____ site

a) A	b) P
c) E	d) Both a & b

- 7) Transcription termination occurs by _____

a) Rho-dependent	b) Pho-independent
c) Sigma factor	d) Both a & b

B) Define the following terms:

07

- 1) Topoisomer
- 2) Activators
- 3) SOS repair
- 4) 50 S ribosome
- 5) RNA Polymerase
- 6) Nitrosylation
- 7) Arthur Kornberg enzyme

Section – II
Answer Any Four

- Q.2** Write a note on base excision and recombination repair with neat labeled diagram. **14**
- Q.3** Write a note on different types of intron splicing and add a note on spliceosome. **14**
- Q.4** Describe the structure, assembly and function of each subunit of DNA pol III with neat labeled diagram. **14**
- Q.5** What is oriC? Explain the eukaryotic DNA replication with neat labeled diagram. **14**
- Q.6 Answer any TWO of the following:** **14**
- a) Write a note on different types RNA molecules
 - b) Explain the recombination process
 - c) Write a note on post transcription modification of eukaryotic mRNA.
- Q.7 Write shorts notes on (Any Two):** **14**
- a) Prokaryotic gene structure
 - b) Eukaryotic ribosome subunits
 - c) Translation initiation factors

Master of Science – I (Biotechnology) Examination: Oct / Nov 2016
Semester – II (Old CGPA)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SK - 109	Thursday 24/11/2016	10.30 AM to 01.00 PM	Immunology & Immune Techniques	IV	

Instructions:

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

Total Marks: 70

Section– I

Q.1 A) Rewrite the following sentences by selecting correct answers from given alternative. 07

- 1) Most abundant class of immunoglobulin found in body is _____
 - a) IgM
 - b) IgA
 - c) IgD
 - d) IgG
- 2) The smallest unit antigenicity is _____
 - a) epitope
 - b) adjuvant
 - c) hapten
 - d) antibody
- 3) Widal test is example of _____ type of reaction.
 - a) agglutination
 - b) precipitation
 - c) flocculation
 - d) complement fixation
- 4) BCG vaccine is _____ type of vaccine.
 - a) Live attenuated
 - b) killed
 - c) toxoid
 - d) toxin
- 5) CD4 surface antigen is present in _____ cells.
 - a) T cytotoxic
 - b) T helper
 - c) Nature killer
 - d) none of these
- 6) The rejection of graft within 48 hours by recipient body is called _____.
 - a) acute
 - b) hyperacute
 - c) chronic
 - d) none of these
- 7) _____ is organs specific autoimmune disease.
 - a) Myasthenia gravis
 - b) Systemic lupus erythematosus
 - c) Graves disease
 - d) None of these

B) Define the following terms:

07

- 1) ELISA
- 2) Antigen
- 3) Autoimmunity
- 4) Antibody
- 5) Innate immunity
- 6) Xenograft
- 7) Transplantation

Section-II

Answer Any Four

- Q.2** Write an account on types of Vaccines. **14**
- Q.3** Write an account Mechanism of T cell mediated immunity. **14**
- Q.4** Give structural, morphological, cultural, life cycle and pathogenecity characters of influenza virus **14**
- Q.5** Explain mechanism of classical complement pathway **14**
- Q.6 Answer any TWO of the following: 14**
- a) Write a note on MHC Class II molecule
 - b) Write a note on mechanism of Grave's disease
 - c) Write note on Radioimmunoassay
- Q.7 Answer any TWO of the following: 14**
- a) Write short not on types of antigen
 - b) Write short note on Primary and secondary immune response
 - c) Write brief note account on mechanism of allograft rejection

Section-II

- Q.2** Explain the different types of Electron microscopy with suitable diagrams. **14**
- Q.3** What are Radio tracer techniques? Give its advantages and restrictions. **14**
- Q.4** Give the principle, instrumentation, working and applications of Atomic Absorption Spectroscopy. **14**
- Q.5 Answer Any two of the following:** **14**
- a) Explain the technique of Pulse Field Gel Electrophoresis
 - b) Write a note on HPLC.
 - c) Differentiate between Turbidimetry and Nephelometry.
- Q.6 Write shorts note onany TWO of the following:** **14**
- a) Biosensors
 - b) Support material used in the technique of Electrophoresis
 - c) Ultracentrifuges

Master of Science – II (Biotechnology) Examination: Oct / Nov 2016
Semester – III (New CBCS)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SK – 115	Friday 18/11/2016	02:30 P.M to 05:00 P.M	Genetic Engineering	X	

- Instructions:**
- 1) Section-I is compulsory.
 - 2) From Section II attempt any four.
 - 3) All questions carry equal marks.
 - 4) Figures to right indicate full marks.
 - 5) Draw neat and labeled diagrams.

Total Marks: 70

Section-I

Q.1 A) Multiple Choice questions:

- 1) CaMV is an
 - a) DNA containing Virus
 - b) Animal Virus
 - c) RNA containing Virus
 - d) Bacteriophage
- 2) The first human protein produced through recombinant DNA technology is
 - a) Insulin
 - b) Erythropoitin
 - c) Interferon
 - d) Somatostatin
- 3) Bt cotton is not:
 - a) A GM plant
 - b) Insect resistant
 - c) A bacterial gene expressing system
 - d) Resistant to all pesticides
- 4) A 'clone' obtained by a sexual reproduction is an _____
 - a) Group of genetically similar organisms
 - b) Population
 - c) Assembly of genes and protein
 - d) None
- 5) The trigger for activation of toxin of *Bacillus thuringiensis* is ,
 - a) Acidic pH of stomach
 - b) High temperature
 - c) Alkaline pH of gut
 - d) None of the above
- 6) A Plant called *Rauwolfia serpentina* is under the threat of extinction. To save this plant, which technique is highly useful?
 - a) DNA finger printing
 - b) Hybridoma technology
 - c) Genetic engineering
 - d) In vitro culture
- 7) Endonucleases, a group of enzymes cleave DNA
 - a) Externally
 - b) Internally
 - c) Both a and b
 - d) Neither a nor b

B) Define the following terms:

- 1) YAC and BAC
- 2) Endonucleases
- 3) Primers
- 4) cDNA
- 5) Marker genes
- 6) Bio-spharming
- 7) Plasmid

Section–II

Attempt any four

Q.2 Long answer type

Add a brief note on DNA sequencing by *Maxam and Gilbert* method

Q.3 Long answer type

With suitable example and application explain vector mediated gene transfer

Q.4 Long answer type

Add a brief note on expression system yeast and bacteria with suitable example?

Q.5 Long answer type any Two:

- a) Explain in detail the construction of Genomic library
- b) Add a note on DNA fingerprinting
- c) Explain in detail DNA Amplification by PCR

Q.6 Write shorts note on any TWO of the following:

- a) Genetically engineered animals
- b) Assembly of genes
- c) Cosmid Vector

Master of Science – II (Biotechnology) Examination: Oct/Nov 2016
Semester – III (New CBCS)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SK– 116	Monday 21/11/2016	02:30 P.M to 05:00 P.M	Research Methodology and IPR	XI	

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

Total Marks: 70

Section– I

Q.1 A) Rewrite the following sentences by selecting correct answers from given alternative. 07

- 1) The data of research is _____
 - a) Qualitative only
 - b) Quantitative only
 - c) Both a & b
 - d) None of these
- 2) Action research is a type of _____
 - a) Applied research
 - b) Quantity research
 - c) Survey research
 - d) Population research
- 3) Hypothesis relates _____
 - a) Constant to variables
 - b) Constant to constant
 - c) Variables to constant
 - d) Variables to variables
- 4) Statistics in used by researchers to _____
 - a) Analyze the empirical data collected in a study
 - b) Operationally define their variables
 - c) Make their finding sound better
 - d) Ensure the study comes out the way it was intended
- 5) Preliminary data collection is a part of the _____
 - a) Descriptive research
 - b) Exploratory research
 - c) Applied research
 - d) Explanatory research
- 6) _____ of the following is not a type of copyright work.
 - a) Literary works
 - b) Furniture
 - c) Sculpture
 - d) Musical works
- 7) Intellectual property Right (IPR) protect the use of information and ideas that are of _____
 - a) Ethical value
 - b) Moral value
 - c) Social value
 - d) Commercial value

B) Define the following terms:

- 1) Pure research
- 2) ANOVA
- 3) Hypothesis
- 4) Trade secrets
- 5) Sampling
- 6) Correlation Coefficient
- 7) IMRAD

Section–II

Attempt any four

- Q.2** What is research? Explain in detail steps in research. **14**
- Q.3** What is sampling theory? Explain in detail the steps in sampling. **14**
- Q.4** Give the different guidelines for writing introduction and materials & methods for preparation of manuscript. **14**
- Q.5 Answer any Two from the following:** **14**
- a) Write a note on patent
 - b) Write a note on data collection methods
 - c) Write a not Preparation of poster for conference
- Q.6 Write shorts note onany TWO of the following:** **14**
- a) Review of Literature
 - b) Primary and secondary data
 - c) Technology transfer.

Master of Science – II (Biotechnology)
Examination: Oct / Nov 2016 Semester – III (New CBCS)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SK – 117	Wednesday 23/11/2016	02:30 P.M To 05:00 P.M	Advanced Pharmaceuticals	XII	

- Instructions:** 1) Section - I is compulsory.
2) From Section - II attempt any four

Total Marks: 70

Section– I

Q.1 A) Rewrite the following sentences by selecting correct answers from given alternative. 07

- 1) Two solution are said to be isotonic if they exert same
 - a) Viscosity
 - b) Surface tension
 - c) Osmotic Pressure
 - d) None of the above

- 2) Buffer index can be defined as the ratio of the increment of strong base/ acid to the _____
 - a) Change in pH
 - b) Change in Viscosity
 - c) Change in osmotic pressure
 - d) None of the above

- 3) Toxicity is measured on the basic of _____ properties
 - a) Pharmacological
 - b) Pharmaceutical
 - c) Rheological
 - d) Colligative

- 4) Dissolution is effected by
 - a) Surface area
 - b) Viscosity
 - c) Temperature
 - d) All of the above

- 5) Electro dialysis is a method for the purpose of
 - a) Purification
 - b) Identification
 - c) Preparation
 - d) Stabilization

- 6) The temperature at which the solubility of the surfactant is equal to CMC is _____
 - a) Boiling point
 - b) Melting point
 - c) Kraft point
 - d) None of the above

- 7) Finely divide powder have _____ wettability
 - a) Average
 - b) Good
 - c) Poor
 - d) Moderate

B) Define the following terms:

07

- 1) Sedimentation
- 2) USP
- 3) Carriers
- 4) Co-solvent
- 5) Surfactant
- 6) Antibacterial activity
- 7) Emulsion

Section–II

- Q.2** Explain in details about hydrotropy in pharmaceuticals **14**
- Q.3** Describe the methods of polymerization and its characterization **14**
- Q.4** Discuss about the stability studies of the drug **14**
- Q.5** **Answer any Two from the following:** **14**
- a) Characterization of granules and compacts
 - b) Factors affecting dissolution rate
 - c) Solid dispersion
- Q.6** **Write shorts note on any TWO of the following:** **14**
- a) Biodegradable polymer
 - b) Cyclodextrin
 - c) Kinetics of the drug

- 7) _____ database constructed almost entirely based on manual examination of protein structures.
- a) SCOP
 - b) CATH
 - c) PDB
 - d) Both CATH and SCOP

B) Define the following terms:

07

- 1) Drug efficacy
- 2) 3D PSSSM
- 3) CYP450
- 4) PSI-PRED
- 5) Motiff
- 6) Domain
- 7) CRD

Section-II

Answer any four of the following:

- Q.2** What is interactome? Explain the in detail Protein-Protein interaction and its importance. **14**
- Q.3** Explain the molecular modeling steps and add a note on model validation. **14**
- Q.4** Explain the 3D structure prediction and explain fold recognition and threading method in details. **14**
- Q.5** **Answer any Two from the following:** **14**
- a) Write a note on Quantitative Structure- Activity relationship
 - b) Explain in detail PDBeNMR, PDBechem, PDBeFold and PDBeMotif.
 - c) Write a note on mutation in drug target.
- Q.6** **Write shorts note onany TWO of the following:** **14**
- a) Protein-DNA interaction prediction tool
 - b) ChemBank
 - c) Yeast three hybrid system