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M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2017
Biotechnology
MICROBIOLOGY

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

Max. Marks: 70

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

Section - I

Q.1 A) Multiple Choice Questions: 07

- 1) Protein particles which can infect are called
 - a) Virons
 - b) Prions
 - c) Nucleoids
 - d) None of these
- 2) Peptone water medium is an example for
 - a) Synthetic medium
 - b) Semisynthetic medium
 - c) Differential medium
 - d) None of these
- 3) Temperature required for pasteurization is
 - a) Above 150⁰ C
 - b) Below 100⁰ C
 - c) 110⁰ C
 - d) None of these
- 4) Separation of a single bacterial colony is called
 - a) Isolation
 - b) Separation
 - c) Pure culturing
 - d) All of these
- 5) Which virus was first observed?
 - a) Hepatitis Virus
 - b) TMV
 - c) Herpes Virus
 - d) None of these
- 6) Example of anaerobic medium
 - a) Wilson blair medium
 - b) Mac-conkey medium
 - c) Robertson's cooked meat
 - d) EMB medium
- 7) Bacteria which need oxygen for growth are called
 - a) Thermophilic bacteria
 - b) Microaerophilic bacteria
 - c) Facultative anaerobic bacteria
 - d) Mycobacteria

B) Define the following terms: 07

- 1) Xerophiles
- 2) Mycotoxins
- 3) Lichens
- 4) ssRNA
- 5) Gram negative bacteria
- 6) Pour plate method
- 7) Type strain

Section – II

Q.2 How are the viruses classified? Add a note on different methods of isolation and cultivation of viruses. **14**

Q.3 What is symbiotic association? What is its influence on the ecosystem? **14**

- Q.4** Explain the different methods of microbial isolation? How does it help in the classification of microorganism? **14**
- Q.5** **Answer any two from the following:** **14**
- a) What is molecular evolution with regards to origin of new genes and proteins?
 - b) What is antagonism? What is influence in discovery of antibiotics?
 - c) Explain with suitable example what are fastidious microorganisms?
- Q.6** **Write short notes on any two of the following :** **14**
- a) Extremophiles
 - b) Taxonomic ranks
 - c) Culture collection centres

Seat No.	
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M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2017
Biotechnology
CONCEPT OF BIOCHEMISTRY

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

Max. Marks: 70

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

Section - I

Q.1 A) Multiple Choice Questions:

07

- 1) In Ramchandran plot, the _____ angles represent the bond angles in C-C bond.
 - a) psi
 - b) phi
 - c) gamma
 - d) delta
- 2) During synthesis of cAMP, the cyclization of ATP molecule occurs in presence of _____ enzyme.
 - a) Transaldolase
 - b) Transketolase
 - c) ATP synthase
 - d) Adenylatecyclase
- 3) The Phosphate and ribose groups are donated by _____, during the bio synthesis of nucleotides.
 - a) PRPP
 - b) Orotate
 - c) Hypoxanthine
 - d) HGPRT
- 4) Elevated level of _____ is used as a diagnostic tool for pregnancy.
 - a) Leutinizing hormone
 - b) vasopression
 - c) Human chorionic gonadotropin
 - d) somatostatin
- 5) Retinol, retina and retinoic acid are the vitamers of vitamin _____.
 - a) A
 - b) B1
 - c) B5
 - d) B12
- 6) The deficiency of enzyme hypoxanthine guanine phosphoribosyl transferase result in _____, which is an inborn disorder.
 - a) Lesch - Nyhan syndrome
 - b) Marasmus
 - c) Pomes disease
 - d) Alkaptonuria
- 7) A thermodynamic reaction cannot occur spontaneously only if the ΔG is _____.
 - a) At equilibrium
 - b) Negative
 - c) Positive
 - d) Maximum

B) Define the following terms:

07

- 1) Secondary messenger
- 2) Redox potential
- 3) Hormone
- 4) Vitamin
- 5) Standard free energy
- 6) Gluconeogenesis
- 7) Protein stability

Section – II

- Q.2** Add a detail account on 'Inborn errors of amino acid metabolism'. **14**
- Q.3** Describe photosystem I and photosystem II. **14**
- Q.4** Give the general classification of hormones. Explain in detail the mechanism of action of any one hormone. **14**
- Q.5 Answer any Two of the following:** **14**
- a) Describe biological coupled reactions. Add a note on 'redox potential'.
 - b) Describe structure & role of fat soluble vitamins.
 - c) Explain structure and role of cAMP.
- Q.6 Answer any TWO of the following :** **14**
- a) Describe concept of protein stability.
 - b) Illustrate biosynthesis of nucleotide.
 - c) Describe hormonal control of menstrual cycle.

Seat No.	
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**M.Sc.(Semester - I) (CBCS) Examination Oct/Nov-2017
Biotechnology
INHERITANCE-BIOLOGY**

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

Max. Marks: 70

- Instructions:** 1) Part-I, Questions-1 is compulsory.
 2) Attempt any-4 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.

Part – I

- Q.1 A) Rewrite the sentence after choosing the correct answer from the given alternatives:** **07**
- 1) Females have a pair of identical chromosome called X chromosomes hence they are called as _____.
 a) Homomorphic b) Heteromorphic
 c) Automorphic d) Gynandromorphic
 - 2) The ideal DNA markers for genetic mapping and population studies are _____.
 a) Minisatellites b) Microsatellites
 c) LINES d) SINES
 - 3) Gene interaction that involves the masking of the gene effect is _____.
 a) Supplementary Genes b) Complementary Genes
 c) Epistasis d) Pleiotropy
 - 4) The organic evolution was coined by _____.
 a) H. Spencer b) A.I. Oparin
 c) Aristotle d) Plato
 - 5) The production of toxic substance Paramecin is controlled by cytoplasmic particles called _____.
 a) Kappa particles b) Alpha particles
 c) Beta particles d) Delta particles
 - 6) _____ is a very efficient method of mapping in bacteria.
 a) Transduction b) Transformation
 c) Conjugation d) Transfection
 - 7) _____ is a disease caused due to mutation in mt DNA.
 a) Myoclonic Epilepsy b) Bleeder’s disease
 c) Down’s syndrome d) None of these

B) Define the following:

07

- 1) Reciprocal cross
- 2) Supplementary Gene.
- 3) Genetic Drift
- 4) Atavistic organ
- 5) Sexduction
- 6) Competency
- 7) Conjugation

Part – II**Answer Any Four of the following:**

- Q.2** Discuss the genetics of ABO blood group system in man with its characteristic features and its applications. **14**
- Q.3** Write in detail about the Euploidy and its significance. **14**
- Q.4** State the Hardy Weinberg equilibrium and add a note on its significance and factors affecting gene frequency. **14**
- Q.5** **Answer any two from the following:** **14**
- a) Explain 9:7 ratio with the help of suitable example.
 - b) Describe the morphological structure of polytene chromosome with neat diagram.
 - c) Explain the inheritance pattern in chloroplast of *Mirabilis jalapa*.
- Q.6** **Write short notes on any two of following:** **14**
- a) Heterochromatin and its types
 - b) Lamarckism
 - c) Microsatellites

Seat No.	
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M.Sc.(Semester - I) (CBCS) Examination Oct/Nov-2017
Biotechnology
BIOSTATISTICS AND BIOINFORMATICS

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

Max. Marks: 70

- Instructions:** 1) Part-I, Questions-1 is compulsory.
 2) Attempt any-4 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.

Part - I

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

- 1) _____ is one of the nucleotide database.

a) GenBank	b) PIR
c) PMC	d) RCSB
- 2) The structural 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 homology modeling tool.

a) BLAST	b) Omega
c) Swiss model	d) All
- 5) Statistical results are _____.

a) Absolutely true	b) Not true
c) True on average	d) Universally true
- 6) Frequency of the variables is always _____.

a) In percentage	b) A fraction
c) An integer	d) None
- 7) _____ is not a measure of central tendency.

a) Mean	b) Variability
c) Median	d) mode

B) Define the following:

07

- 1) Transcriptomics
- 2) Alignment
- 3) Molecular dynamics
- 4) Biostatistics
- 5) Variable
- 6) Median
- 7) Chi square test

Part - II

Answer Any Four of the following:

- Q.2** Define Bioinformatics. Add a note on its importance. **14**
- Q.3** Add a note on types of protein databases. **14**
- Q.4** Write a note on regression and correlation. **14**
- Q.5** **Answer any two from the following:** **14**
- a) Write a note on multiple sequence analysis alignment.
 - b) Add a note on Phylogenetics analysis software's.
 - c) Represent the following data by means of Pie-diagram:-

Name of College	No. of students
Engineering	440
Arts	220
Agriculture	120
Home science	80
Fine Arts	60

- Q.6** **Write short notes on any two of following:** **14**
- a) Protein structure prediction.
 - b) Advantages & disadvantages of median.
 - c) Applications of sampling techniques.

Seat No.	
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M.Sc.(Semester - I)(CBCS) Examination Oct/Nov-2017

**Biotechnology
CLINICAL BIOINFORMATICS**

Day & Date: Thursday, 23-11-2017

Max. Marks: 70

Time: 10.30 AM to 01.00 PM

- Instructions:** 1) Part-I, Questions-1 is compulsory.
 2) Attempt any-4 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.

Part - I

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

- 1) The _____ technology has been available and can generate about 100 million reads per run on a single sequencing machine.
 - a) California
 - b) Stanford
 - c) Illumina
 - d) All of above
- 2) A wide variety of microarray analysis tools are available through Bioconductor written in the _____ programming language.
 - a) C
 - b) Java
 - c) Perl
 - d) R
- 3) FastQC next generation sequencing tool is tool on _____ platform.
 - a) Illumina
 - b) FASTQ
 - c) GNU Glib
 - d) CASAVA
- 4) The first pathogen genome _____ that of was sequenced by traditional Sanger methods.
 - a) Hemophilic influenza
 - b) Staphylococcus epidermidis
 - c) Staphylococcus aureus
 - d) Neisseria meningitides
- 5) _____ is the total number of metabolites present within an organism, cell or tissue.
 - a) Proteome
 - b) Metabolome
 - c) Genome
 - d) Pharmacogenomics
- 6) _____ is a joint scientific project between the European Bioinformatics Institute and the Wellcome Trust Sanger institute.
 - a) NCBI
 - b) Ensembl
 - c) Swiss – Prot
 - d) BioMart
- 7) International Statistical Classification of Diseases is developed by _____.
 - a) Sanger
 - b) WHO
 - c) ICHI
 - d) ICF

B) Define the following:

- 1) Transcriptomics
- 2) Microarray
- 3) Pathology informatics
- 4) Medical coding
- 5) Metabolomics
- 6) HGP
- 7) Pharmacogenomics

Part – II**Answer Any Four of the following:**

- Q.2** Write a detailed note on various platforms and applications of NGS. **14**
- Q.3** Define medical bioinformatics. Add a note on disease under its study. **14**
- Q.4** Explain the challenges and applications of Human Genome Project. **14**
- Q.5** **Answer any two from the following:** **14**
- a) Add a note on R scripting with its applications.
 - b) Write note on host-pathogen interactions?
 - c) Explain the international classification of diseases.
- Q.6** **Write short notes on any two of the following:** **14**
- a) Genome mapping
 - b) Genetic diseases
 - c) Systems biology

Seat No.	
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M.Sc. (Semester - II) (New) (CBCS) Examination Oct/Nov-2017
Biotechnology
CELL BIOLOGY

Day & Date: Friday, 17-11-2017
 Time: 10.30 AM to 01.00 PM

Max. Marks: 70

- Instructions:** 1) All questions 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.

Section - I

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

- 1) In prokaryotic cells _____ is commonly present.
 - a) Histone
 - b) Plasmid
 - c) Nuclear envelope
 - d) Nucleus
- 2) N-acetylneuraminic acid is also called as _____.
 - a) Muramic acid
 - b) Guanylate cyclase
 - c) Ascorbic acid
 - d) Sialic acid.
- 3) The arrangement of microtubules in eukaryotic flagella is referred to as _____.
 - a) Undulating
 - b) Basal
 - c) 9+2
 - d) Ciliary
- 4) Many surface proteins are anchored by _____.
 - a) Nonpolar fatty acids
 - b) Nonpolar amino acids
 - c) Polar amino acids
 - d) Polar fatty acids
- 5) The _____ surrounds the cell like a belt, preventing the passage of substances between the cells.
 - a) Tight junction
 - b) Gap junction
 - c) Desmosome
 - d) Hemidesmosome
- 6) Binding of epinephrin to a G protein-linked receptor causes adenylyl cyclase to produce large amount of _____.
 - a) A-kinase
 - b) cAMP
 - c) phospholipase C
 - d) inositol triphosphate
- 7) If gametes have 8 chromosomes, the cell resulting from syngamy will have _____ chromosomes.
 - a) 8
 - b) 4
 - c) 2
 - d) 16

B) Define the terms **07**

- 1) Apoptosis
- 2) Dynein
- 3) Desmosomes
- 4) Plasma membrane
- 5) Intracellular Protein trafficking
- 6) Protein Tyrosine Kinase.
- 7) Cell cycle check points.

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

- Q.2** Write about microfilaments and its motor protein activity in muscle contraction and relaxation. **14**
- Q.3** Explain difference between somatic cell division and sex cell division. **14**
- Q4** Describe Structural and function capitalization of Cell organelles-chloroplast. **14**
- Q5** **Answer any two from the following** **14**
- a) Add a note on 'Tight junction'.
 - b) Write a note on 'ATP dependent Membrane transport'.
 - c) Explain Ras-MAP Kinase pathway
- Q.6** **Write short notes on (any two)** **14**
- a) Add a note on 'G-protein-Coupled receptors'.
 - b) Describe 'Calcium as an intracellular messenger'.
 - c) Explain 'Fluid Mosaic Model'.

Seat No.	
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M.Sc. (Semester - II) (Old) (CBCS) Examination Oct/Nov-2017
Biotechnology
CELL BIOLOGY

Day & Date: Friday, 17-11-2017
 Time: 10.30 AM to 01.00 PM

Max. Marks: 70

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

Section - I

Q.1 A) Rewrite the sentence after choosing the correct from the given **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) Protoplasm found inside the nucleus is known as _____.
 a) Amyloplast
 b) Nucleoplasm
 c) Cytoplasm
 d) Elaioplast
- 4) Plasmodesmata occurs in _____.
 a) Plants
 b) Animals
 c) Bacteria
 d) All of the above
- 5) _____ is a type of adhering junction between animal cells.
 a) Tight junction
 b) Calcium gated channel
 c) ATP
 d) GTP
- 6) Receptors that are recognized by immune system are _____.
 a) Immunoglobulin
 b) MHC proteins
 c) T receptors
 d) All of the above
- 7) Gap junctions are formed by
 a) The fusion of plasma membranes to form a single membrane.
 b) The insertion of protein complexes that form tunnel between cells
 c) Gap in the cell wall of plants
 d) None of the above

B) Define the terms **07**

- 1) Endoplasmic Reticulum
- 2) Cell-matrix Interaction
- 3) Gastrulation
- 4) Meiosis
- 5) Lysosomes
- 6) Apoptosis
- 7) Selectins

Section - II

- Q.2** Add a brief note on cell senescence and Programmed cell death. **14**
- Q.3** Add a note on cell cycle and role of cyclins and cdks during cell division. **14**
- Q4** Explain in detail cell structure and organization of prokaryotic and eukaryotic cells. **14**
- Q5** **Answer any two from the following** **14**
- a) Cell cytoskeleton
 - b) Tight and Gap junction
 - c) Blastulation and Gastrulation cell cleavage.
- Q.6** **Write short notes on (any two)** **14**
- a) Desmosomes and Hemidesmosomes.
 - b) WNT Singling pathway.
 - c) Cell-Matrix Interaction

Seat No.	
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**M.Sc. (Semester - II) (Old) (CBCS) Examination Oct/Nov-2017
Biotechnology
ENZYME TECHNOLOGY**

Day & Date: Monday, 20-11-2017
Time: 10.30 AM to 01.00 PM

Max. Marks: 70

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

Section – I

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

- 1) In competitive enzyme activity inhibition
 - a) The structure of inhibitor generally resembles that of the substrate.
 - b) Inhibitor decreases apparent K_m
 - c) K_m remains unaffactive
 - d) Inhibitor decreases V_{max} without affecting K_m
- 2) 1 international unit is _____ μkatal .
 - a) 6
 - b) 60
 - c) 0.6
 - d) 600
- 3) Ternary complex is not formed in _____.
 - a) Ordered bi bi reaction
 - b) Random bi bi reaction
 - c) Ping pong bi bi reaction
 - d) All of these
- 4) The isoenzymes of LDH
 - a) Differ only in a single amino acid
 - b) Differ in catalytic activity
 - c) Exist in 5 forms depending on M and H monomer contents
 - d) Occur as monomers
- 5) The subunit composition of lactate dehydrogenase of heart is _____.
 - a) M_4
 - b) M_2H_2
 - c) HM_3
 - d) H_4
- 6) In Na^+K^+ ATPase catalytic activity and ion binding sites are present in _____ subunit.
 - a) α
 - b) β
 - c) Both α and β
 - d) None of these
- 7) $K_m =$ _____.
 - a) k_1+k_2/k_{-1}
 - b) $k_{-1}+k_2/k_{-1}$
 - c) k_1+k_{-1}/k_{-1}
 - d) $k_{-1}+k_2/k_1$

B) Define the terms**07**

- 1) Turn over number
- 2) K_m
- 3) Ribozyme
- 4) SGPT
- 5) Metabolic engineering
- 6) Cooperativity
- 7) Allosteric enzyme

Section - II

- Q.2** Explain in detail structure function relationship of enzyme Lysozyme. **14**
- Q.3** Define immobilization of enzyme? Write the methods of immobilization. **14**
- Q.4** Explain IUB nomenclature system. Discuss in detail enzyme classification each with two examples. **14**
- Q.5** What is enzyme inhibition? Explain in detail enzyme inhibition with their Kinetics? **14**
- Q.6 Write any two of the following:-** **14**
- a)** Explain in detail structure function relationship of enzyme ribonuclease.
 - b)** Write a note on bio-sensor.

Seat No.	
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Set	P
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M.Sc. (Semester - II) (Old) (CBCS) Examination Oct/Nov-2017
Biotechnology
MOLECULAR CELL PROCESSING

Day & Date: Wednesday, 22-11-2017
Time: 10.30 AM to 01.00 PM

Max. Marks: 70

- Instructions:** 1) All questions of Section I is compulsory.
2) Answer any Four questions from section II.
3) All question carry equal marks.
4) Answer to the Section I and Section II are to be written in the same answer book.

Section - I

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

- 1) The phenomenon of genetic transformation was studied by _____.
 a) Oswald Avery b) Frederick Griffith
 c) Korenberg d) Watson and Crick
- 2) The biologically important form of DNA that is naturally found in most living system is _____.
 a) A-DNA b) B-DNA
 c) Z-DNA d) E-DNA
- 3) The organisms which have only RNA is called _____.
 a) Ribotids b) Ribonucleotides
 c) Genetic RNA d) Non genetic RNA
- 4) The length of 10 nucleotides is 34 A0 its length in mm is _____.
 a) 340 mm b) 3.4 mm
 c) 0.34 mm d) All of these
- 5) DNA replication occurs as _____.
 a) Conservative b) Semi conservative
 c) Dispersive d) Semi discontinuous
- 6) The synthesis of lagging strand takes places as _____.
 a) Continuous b) Discontinuous
 c) Bidirectional d) None of these
- 7) The replicon in E. Coli is called _____.
 a) Ori-A b) Ori-C
 c) Ori-B d) Ori-D

B) Define the terms 07

- 1) Palindromes
- 2) Primers
- 3) DNA helicase
- 4) B-DNA.
- 5) Replisome.
- 6) Shine-Dalgarno Sequences.
- 7) TATA Box

Section-II

- Q.2** Explain in detail replication of eukaryotic DNA with a note on the different enzymes. **14**
- Q.3** Write in detail about the different DNA repair mechanism. **14**
- Q.4** Describe briefly the process of RNA synthesis in eukaryotes. **14**
- Q.5** Explain the structure of Lac operon and write a note on positive regulation. **14**
- Q.6** **Write any two from the following:-** **14**
- a)** Write a note on activators.
 - b)** Write a note on tryptophan operon.
 - c)** Write about promoters in prokaryotes.

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

- Q.2** Write an account on mechanism of organ specific autoimmune diseases. **14**
- Q.3** Write an account on mechanism of Humoral immunity. **14**
- Q4** Explain structure of MHC molecules and its function. **14**
- Q5** **Answer any two :-** **14**
- a) Structure and function of antibody molecule.
 - b) Explain immunoelectrophoresis with two tests.
 - c) General structure, cultural characters, life cycle, pathogenicity, laboratory diagnosis prophylaxis of *Mycobacterium tuberculosis*.
- Q.6** **Answer any two :-** **14**
- a) Immunological basics of graft rejection.
 - b) Explain Primary Lymphoid organs with its function.
 - c) Explain cells of immune system.

Section – II

- Q.2** Explain the chromatographic techniques use in purification of desired product from fermented broth. **14**
- Q.3** Write in details about treatment of the industrial effluent with labeled diagrams. **14**
- Q.4** Discuss the energy source involved in fermentation process. **14**
- Q.5** **Answer any two from the following:** **14**
- a) Wine production
 - b) Citric acid production
 - c) Solid liquid separation
- Q.6** **Answer any two from the following:** **14**
- a) Non-conventional energy sources.
 - b) Types of Air Pollution Control methods.
 - c) Effect of heavy metals on environment.

Seat No.	
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Set **P**

M.Sc. (Semester - III) (New) (CBCS) Examination Oct/Nov-2017
Biotechnology
GENETIC ENGINEERING

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

Max. Marks: 70

- Instructions:** 1) All questions of Section I are compulsory.
 2) Answer any Four questions from section II.
 3) All question carry equal marks.

Section - I

Q.1 A) Rewrite the sentence after using correct alternative given below:- 07

- 1) Restriction enzymes are _____.
 a) DNA unwinding enzymes b) DNA joining enzymes
 c) DNA cleaving enzymes d) None of these
- 2) Ti plasmid used in genetic engineering is obtained from _____.
 a) Bacillus thuringiensis b) Agrobacterium rhizogenes
 c) Agrobacterium tumefaciens d) Bacillus subtilis
- 3) Who discovered recombinant DNA (rDNA) technology?
 a) Har Gobind Khorana b) J. D. Watson
 c) Sutton and Boveri d) Stanely Cohen and Herbert Boyer
- 4) Which of the following is used as vector in gene therapy for SCID
 a) Arbovirus b) Rotavirus
 c) Parvovirus d) Retrovirus
- 5) Get Electrophoresis separate DNA fragments according to their _____.
 a) Percentage of labelled nucleotides b) Base sequence
 c) Electrical charge d) Size
- 6) Why is it more difficult to create transgenic animals than transgenic plants?
 a) Plants and animals use a different genetic code
 b) Animals cells cannot replicate foreign DNA
 c) It is more difficult to introduce foreign DNA into animal cells.
 d) Animal cells cannot transcribe and translate foreign DNA
- 7) Which enzymes are used to cut large segments of DNA into fragments for DNA fingerprinting?
 a) Reverse transcriptase b) Restriction enzymes
 c) DNA polymerase d) DNA ligase

B) Define the following terms. 07

- 1) Restriction enzyme
- 2) Expression Vector
- 3) cDNA library
- 4) DNA chips
- 5) Electroporation
- 6) Biopharming
- 7) Plasmid.

Section – II

- Q.2** Explain in details of the expression vectors used in the cloning? **14**
- Q.3** Discuss the methods of screening in rDNA technology. **14**
- Q.4** Describe in details DNA sequencing methods. **14**
- Q.5** **Answer any two from the following:** **14**
- a) Transgenic animals
 - b) Gene gun
 - c) Genomic Library
- Q.6** **Write short notes on. (Any two)** **14**
- a) Shuttle vector
 - b) Bacteriophages vector
 - c) RAPD.

B) Define the following terms:

07

- 1) Phytohormones
- 2) 35 S promoter
- 3) Male Gametophyte
- 4) Ti Plasmids
- 5) Secondary Metabolites
- 6) Micropropagation
- 7) Cloning

Section - II

- Q.2** Discuss in brief about Plant nutrients with their roles in plants. **14**
- Q.3** Add a brief note on Basics of tumor formation in plants. **14**
- Q4** Discuss in brief about vector less (Direct gene transfer) transformation in plant? **14**
- Q5** **Answer any two from the following** **14**
- a) Application of plant biotechnology
 - b) Answer in detail steps involved in Micropropagation
 - c) Protoplast Isolation
- Q.6** **Write short notes on any Two of the following:** **14**
- a) Soma-clonal Variation/ In vitro mutagenesis
 - b) Shoot tip culture
 - c) Molecular Farming

Section – II

- Q.2** Explain the different types of Electron microscopy with suitable diagrams. **14**
- Q.3** Write a note on the methods of measurement of Radioactivity? Give their advantages and restrictions. **14**
- Q4** Give the principle, instrumentation, working and applications of Atomic Absorption Spectroscopy. **14**
- Q5** **Answer any two of the following.** **14**
- a) Explain the technique of SDS-PAGE.
 - b) Write a note on GC-MS.
 - c) Explain the technique of NMR.
- Q.6** **Write short notes on any two of the following:-** **14**
- a) Application of radio isotopes in Biological sciences.
 - b) Support material used in the technique of Chromatography.
 - c) Ultracentrifuges

Seat
No.Set **P**

**M.Sc. (Semester - IV) (New) (CBCS) Examination Oct/Nov-2017
Biotechnology**

ANIMAL BIOTECHNOLOGY AND STEM CELL TECHNOLOGY

Day & Date: Friday, 17-11-2017
Time: 02.30 PM to 05.00 PM

Max. Marks: 70

- Instructions:** 1) All questions of Section I is compulsory.
2) Answer any Four questions from section II.

Section – I

Q.1 A) Multiple choice Questions:-

07

- 1) Animal cell cultures are used widely for the production of _____.
 - a) Insulin
 - b) Somatostatin
 - c) MABS
 - d) Thyroxine
- 2) The first vaccine developed from animal cell culture was for _____.
 - a) Hepatitis B
 - b) Influenza
 - c) Small Pox
 - d) Polio
- 3) Recombinant proteins are _____.
 - a) Proteins synthesized in animals
 - b) Proteins synthesized by transgene in host cells by r DNA technique
 - c) Proteins synthesized in cells that are produced by protoplast fusion.
 - d) Proteins synthesized in mutated cells line
- 4) Interferons are _____.
 - a) Antibacterial proteins
 - b) Anti viral proteins
 - c) Bacteriostatic proteins
 - d) All of these
- 5) The production of complete animals from somatic cells of an animal is called _____.
 - a) Gene cloning
 - b) Animal cloning
 - c) Cell cloning
 - d) All of these
- 6) In Bioreactors _____ are used for aeration.
 - a) Spargers
 - b) Impellers
 - c) Baffles
 - d) Both B & C
- 7) Which of the following has been produced commercially from mammalian cultures _____.
 - a) Insulin
 - b) Renin
 - c) Plasminogen activator
 - d) Antibacterial antibody

B) Define the following terms:-

07

- 1) Suspension culture
- 2) Scaffolds
- 3) Scaling up
- 4) Cell line
- 5) Cryopreservation
- 6) Stem cells
- 7) Xenograft

Section - II

- Q.2** Give brief account on the Bioreactor design of Animal cell culture with the help of a suitable diagram. **14**
- Q.3** Write in details about the behavior of cells in culture. **14**
- Q.4** Discuss the concept of Transgenic animal technology and write about the methods used for preparing transgenes. **14**
- Q.5 Answer any two from the following** **14**
- a) Hematopoietic Stem cells.
 - b) Regeneration of bone and cartilage.
 - c) Animal cell culture medium
- Q.6 Answer any two of the following :-** **14**
- a) Common cell culture contaminants.
 - b) Significance of Knock out animals.
 - c) Organotypic Culture.

Section - II

- Q.2** Briefly explains the design of bioreactor and its types. **14**
- Q.3** Define upstream processing and write in detail production of any two antibiotics. **14**
- Q.4** Describe about the environment protection and conservation. **14**
- Q.5** **Answer any two from the following.** **14**
- a) Methods of Preservation of microorganism.
 - b) Continuous fermentation
 - c) Streptomycin production
- Q.6** **Answer any two from the following.** **14**
- a) Methods of cell lysis.
 - b) Physical and chemical methods for effluent treatment
 - c) Non-conventional energy sources.

Seat No.	
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Set **P**

M.Sc. (Semester - IV) (New) (CBCS) Examination Oct/Nov-2017
Biotechnology
PLANT BIOTECHNOLOGY

Day & Date: Wednesday, 22-11-2017
 Time: 02.30 PM to 05.00 PM

Max. Marks: 70

- Instructions:** 1) Section-I compulsory.
 2) Answer any four question from section-II

Section - I

Q.1 A) Multiple Choice Question:-

07

- 1) Epigenetic variation occurs due to _____.
 a) Tissue culture practices b) Pre existing variations
 c) Both a and b d) None of the above
- 2) Cybrids are _____.
 a) Cytoplasmic hybrids b) Genomic hybrids
 c) Protoplast d) None of the above
- 3) Totipotency refers to _____.
 a) The ability of a plant cell to arrest the growth of a plant
 b) The ability of a plant cell to develop disease in plant
 c) The ability of a plant cell to develop into a complete plant
 d) The ability of a plant cell to develop into a callus.
- 4) Green Fluorescence protein is a _____.
 a) Selectable marker gene b) Reporter gene
 c) A gene from animal cell d) All of the above
- 5) Gold / Tungsten nano particles are widely used for coating of DNA fragments in _____.
 a) Electroporation b) Gene gun
 c) Microinjection d) All of the above
- 6) Protoplasts can be produced from suspension cultures, callus tissues or intact tissues by enzymatic treatment with _____.
 a) Cellulolytic enzyme b) Pectinolytic enzymes.
 c) Both a & b d) Protease
- 7) CaMv is _____.
 a) DNA containing virus
 b) RNA containing virus
 c) Protein containing virus
 d) Both DNA and RNA containing virus

B) Define the following terms

07

- 1) Gene gun
- 2) Haploid plant
- 3) Embryos
- 4) Colchicine
- 5) Viral vectors
- 6) Reporter gene
- 7) Acclimatization

Section - II

- Q.2** Discusses in brief role of Micronutrients and Phyto-hormones in plant growth. **14**
- Q.3** What do you mean somaclonal variation? Explain in detail mechanism behind somaclonal variation. **14**
- Q.4** Discuss in brief about Mechanism of DNA transfer and role of virulence gene in Agro bacterium mediated gene transfer. **14**
- Q.5** **Answer any Two of the following:** **14**
- a) Edible Vaccine production
 - b) Biotic stress resistance in plants.
 - c) CaMV as a cloning vector.
- Q.6** **Write short notes on any Two of the following:** **14**
- a) Initiation and maintenance of callus.
 - b) Cell and plant tissue culture lab set up.
 - c) Plant hormones.

Seat
No.Set **P**

M.Sc. (Semester - IV) (New) (CBCS) Examination Oct/Nov-2017
Biotechnology
ADVANCED PHARMACOGNOSY

Day & Date: Friday, 24-11-2017
 Time: 02.30 PM to 05.00 PM

Max. Marks: 70

- Instructions:** 1) Section-I compulsory.
 2) Answer any four question from section-II

Section - I

Q.1 A) Multiple Choice Questions:-

07

- 1) Identify the term used for the study of drugs and their effect on the body:
 - a) Pharmacy
 - b) Pharmaceutical
 - c) Pharmacology
 - d) Physiotherapy
- 2) Identify the route of administration for ear drops :
 - a) Oral administration
 - b) Parenteral administration
 - c) Topical administration
 - d) None of above
- 3) Identify the term used to describe an injection that is given just under the skin of an animal:
 - a) Subcutaneous
 - b) Intramuscular
 - c) Intravenous
 - d) Epidural
- 4) Identify the term used to describe an injection that is given into the vein of an animal :
 - a) Subcutaneous
 - b) Intramuscular
 - c) Intravenous
 - d) Epidural
- 5) A research aims at finding a solution to an immediate problem arising in society is _____.
 - a) Fundamental
 - b) Applied
 - c) Descriptive
 - d) Historical
- 6) Characteristics of research is _____.
 - a) Inter-disciplinary team approach
 - b) Objectivistic approach
 - c) Economical in nature
 - d) All of these
- 7) Sampling theory helps us to estimate _____ population.
 - a) Unknown
 - b) Known
 - c) Particular
 - d) Universal

B) Define the following terms

07

- 1) Research
- 2) Sample
- 3) Herbal drug
- 4) Scale up
- 5) Toxicology
- 6) Antipoetic ulcer
- 7) Antechamber

Section – II

- Q.2** Define Research explain in details of types of Research. **14**
- Q.3** Explain in details Infrastructure of herbal drug industry. **14**
- Q.4** Discuss the principle clinical stability stability and safety of herbal drugs. **14**
- Q.5** **Answer any Two of the following** **14**
- a) Effect of herbal Medicine
 - b) Immunomodulators
 - c) Hepatoprotectives
- Q.6** **Write any Two of the following** **14**
- a) Nervine tonic
 - b) Volatile oil
 - c) Natural sweetness

Seat No.	
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Set **P**

**M.Sc. (Semester - IV) (New) (CBCS) Examination Oct/Nov-2017
Biotechnology**

MEDICAL BIOTECHNOLOGY AND BIO NANOTECHNOLOGY

Day & Date: Friday, 24-11-2017
Time: 02.30 PM to 05.00 PM

Max. Marks: 70

- Instructions:** 1) Section-I compulsory.
2) Answer any four question from section-II

Section – I

Q.1 A) Multiple Choice Questions:-

07

- 1) Arabinose is a test-tube test used for _____.
 - a) Enterococci
 - b) Salmonella
 - c) G-bacteria
 - d) Neisseriae
- 2) Choose the incorrect statement about Endo agar.
 - a) Only some G+ bacteria can grow on it selectively
 - b) Can be used to differentiate lactose fermentation
 - c) Is similar to McConkey medium
 - d) Combines selective and diagnostic properties
- 3) Choose the correct statement about Antigen detection
 - a) It is an indirect method
 - b) Negative result means presence of microbe in the patient's body
 - c) It is carried out in the laboratory using antibodies of animal origin
 - d) Uses a sample of patients saliva
- 4) The third phase of the PCR reaction involves _____.
 - a) Detection of amplification product
 - b) Amplification of DNA
 - c) Breakdown of DNA
 - d) Obtaining isolated DNA
- 5) The prefix "nano" comes from a _____.
 - a) French word meaning billion
 - b) Greek word meaning dwarf
 - c) Spanish word meaning particle
 - d) Latin word meaning invisible
- 6) What is the general name for the class of structures made of rolled up carbon lattices?
 - a) Nanorods
 - b) Nanotubes
 - c) Nanosheets
 - d) Fullerrods
- 7) What is the term used in the field of nantechnology to describe an as yet theoretical device the "will be able to bond atoms together in virtually any stable pattern?"
 - a) Stacker
 - b) Replicator
 - c) Assembler
 - d) Constructor

B) Define the following :-**07**

- 1) Normal flora
- 2) Coagulase A
- 3) Biochemical test
- 4) Biosensor
- 5) Penicillin
- 6) Gene therapy
- 7) Nanotechnology

Section - II

- Q.2** Briefly explains epidemiology study and pathogenesis of HIV infection. **14**
- Q.3** Describe the vaccination for prevention of diseases. **14**
- Q.4** Define the interferon and discuss the induction of interferon and types of inducers. **14**
- Q.5 Answer any Two of the following :-** **14**
- a) Drug delivery
 - b) Hydrothermal method
 - c) *Salmonella typhi*
- Q.6 Write any Two of the following :-** **14**
- a) Diagnosis of parasitic
 - b) Antiviral agents
 - c) Physical method for synthesis of nanoparticles.