KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – SONIKA
Class- B.sc Ist semBIOTECHNOLOGY
Subject- IBT
Paper- Ist

4 Sept, 2022	**Sunday**
2nd Week **5 Sept- 7 Sept**	Definition & scope of Biotechnology, introduction of genetic engineering
11 Sept, 2022	**Sunday**
3rd Week **12 Sept-14 Sept**	plant and animal tissue culture
18 Sept, 2022	**Sunday**
4th Week **19 Sept-21 Sept**	fermentation technology; immobilized enzymes; monoclonal antibodies
23 Sept,2022 **25 Sept, 2022** **26 Sept, 2022**	**Shaheedi Divas/ Haryana War Heroes' Martyrdom Day** **Sunday** **Maharana Agrasen Jayanti**
5th Week **27 Sept - 28 Sept**	hybridoma technology; embryo transfer technology; introduction to gene and genomes, Proteins and proteome
30 Sept, 2022	**Talent show**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – SONIKA
Class- B.sc Ist sem BIOTECHNOLOGY
Subject- IBT
Paper- Ist

October, 2022 **1st Week** **1 Oct,2022**	**Talent Show Holiday**
2 Oct, 2022	**Sunday**
1st Week **3 Oct - 5 Oct**	history of genetic manipulations, recombinant DNA technology
5 Oct,2022 **9 Oct,2022**	**Dussehra** **Sunday**
2nd Week **10 Oct - 12 Oct**	DNA fingerprinting and forensic
13 Oct, 2022 **16 Oct,2022**	**Karwa Chauth** **Sunday**
3rd Week **17 Oct - 19 Oct**	Application of biotechnology in agriculture
22 Oct - 26 Oct	**Diwali Break**
4th Week **31 Oct**	animal and veterinary sciences
30 Oct, 2022	**Sunday**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – SONIKA
Class- B.sc Ist semBIOTECHNOLOGY
Subject- IBT
Paper – Ist

November, 2022 **1st Week** **1 Nov, 2022**	Haryana Day
1st Week **2 Nov**	pharmaceutical industry, food industry and chemical industry. Bioremediation and waste treatment biotechnology
6 Nov, 2022	**Sunday**
2nd Week **7 Nov – 9 Nov**	Biotechnology research in India. Biotechnology in context of developing world
8,9Nov,12, **13 Nov, 2022**	**Sh. Guru Nanak Dev jayanti, elections holiday** **Sunday**
3rd Week **14 Nov - 16 Nov**	Brief account of safety guidelines and risk assessment in biotechnology
20 Nov, 2022	**Sunday**
4th Week **21 Nov - 23 Nov**	Ethics in Biotechnology
27 Nov, 2022	**Sunday**
5th Week **28 Nov – 3 Dec**	**Sessional Exams**
4 Dec, 2022	**Sunday**
2nd Week **5 Dec - 7 Dec**	Intellectual property rights.
3rd Week **15 Dec,2022** **Onwards**	**University Examination**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – BHARTI BINDAL
Class- Bsc 1st sem biotechnology
Subject- BIOCHEMISTRY
Paper- II

September, 2022 **1st Week** **1 Sept-3 Sept**	Biomolecules: Introduction, important features, covalent and non-covalent interactionsCarbohydrates: Introduction and Biological Significance. Definition and classification: Monosaccharides; families of monosaccharides; simple aldoses and ketoses
4 Sept, 2022	**Sunday**
2nd Week **8 Sept- 10 Sept**	Configuration and Conformation, Stereoisomerism/ Asymmetric centres, Fischer and Haworth projection formula, pyranose and furanose ring forms, reducing and non-reducing sugars, sugar derivatives viz. sugar alcohols, amino sugars, deoxy sugars, acidic sugars, Glycosidic bond Disaccharides and Oligosaccharides: Definition, structure and function of important di and oligosaccharides viz. lactose, sucrose, maltose, raffinose, stachyose,verbascose
11 Sept, 2022	**Sunday**
3rd Week **15 Sept-17 Sept**	Polysaccharides: Homo and Hetero polysaccharides, storage polysaccharides: Starch and Glycogen. Structural polysaccharides: Cellulose and Chitin. A brief account of structure and function of mucopolysaccharides/Glycosaminoglycans (Hyaluronic acid, Chondroitin sulphate), Glycoproteins and Proteoglycans.
18 Sept, 2022	**Sunday**
4th Week **22 Sept-24 Sept**	Amino acids, Peptides and Proteins: Classification and structure of amino

	acids, essential amino acids, rare and non-protein amino acids, optical and chemical properties of amino acids; acidbase behaviour/zwitterions; pKa value and titration curve
23 Sept,2022 **25 Sept, 2022** **26 Sept, 2022**	**Shaheedi Divas/ Haryana War Heroes' Martyrdom Day** **Sunday** **Maharana Agrasen Jayanti**
5th Week **29 Sept ,2022**	Peptide bond – nature and characteristics. Definition; structure and function of some biologically important peptides
30 Sept, 2022	**Talent show**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher BHARTI BINDAL
Class- Bsc biotechnology sem 1st
Subject- Biochemistry
Paper- II

October, 2022 **1st Week** **1 Oct,2022**	**Talent Show Holiday**
2 Oct, 2022	**Sunday**
1st Week **6 Oct - 8 Oct**	Proteins: Classification based on structure and function. Structural organization of protein
5 Oct,2022 **9 Oct,2022**	**Dussehra** **Sunday**
2nd Week **14 Oct - 15 Oct**	Primary structure; Secondary structure-α-Helix, β- pleats and β – turn Tertiary structure – myoglobin and lysozyme etc. Quaternary structure-hemoglobin
13 Oct, 2022 **16 Oct,2022**	**Karwa Chauth** **Sunday**
3rd Week **20 Oct - 21 Oct**	Forces stabilizing different structural levels.
22 Oct - 26 Oct	**Diwali Break**
4th Week **27 Oct - 29Oct**	Amino acid analysis/N-terminal amino acid analysis- Sanger's method, Edmann's degradation, dansyl chloride and dabsyl chloride
30 Oct, 2022	**Sunday**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – BHARTI BINDAL
Class-- Bsc biotechnology sem 1st
Subject- - Biochemistry
Paper- II

November, 2022 **1st Week** **1 Nov, 2022**	Haryana Day
1st Week **3 Nov - 5 Nov**	Lipids: Introduction and Classification – simple and complex lipids, Fatty acids – structure and nomenclature, soap value, acid value, iodine number, rancidity
6 Nov, 2022	**Sunday**
2nd Week **10 Nov – 12 Nov**	Essential fatty acids. A general account of structure and function of triacylglycerols, phospholipids, glycolipids, sphingolipids
8 Nov,2022 **13 Nov, 2022**	**Sh. Guru Nanak Dev jayanti** **Sunday**
3rd Week **17 Nov - 19 Nov**	steroids, bile acids, bile salts and terpenes Nucleotides and Nucleic acids: Building blocks: bases, sugars and phosphates
20 Nov, 2022	**Sunday**
4th Week **24 Nov - 26 Nov**	Structure and nomenclature of nucleosides and nucleotides; polynucleotides, DNA (A,B, ZDNA) and RNA (rRNA, mRNA, tRNA). Properties of DNA – absorption, denaturation, renaturation, hybridization, Tm/Cot values.
27 Nov, 2022	**Sunday**
5th Week **28 Nov – 3 Dec**	**Sessional Exams**
4 Dec, 2022	**Sunday**
2nd Week **5 Dec , 10 Dec,12DEC**	Biologically important nucleotides and their functions – ATP, GTP, Coenzyme A, NAD, FAD and cAMP.
3rd Week **15 Dec,2022 Onwards**	**University Examination**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – Kajal Rani
Class- B.Sc. biotechnology Semester III
Subject- Immunology
Paper- VI

September, 2022 **1st Week** **1 Sept-3 Sept**	Immunology: Introduction, History and Scope. Terminology of immune system
4 Sept, 2022	**Sunday**
2nd Week **8 Sept- 10 Sept**	Immunity: Definition, types of Immunity- Innate, Adaptive/acquired (active, passive, natural/artificial, Humoral and Cell mediated immunity). Features of Immune Response – memory, cell specificity/diversity, recognition of self and non-self.
11 Sept, 2022	**Sunday**
3rd Week **15 Sept-17 Sept**	Cells of the Immune System – B and T cells (types and receptors), Null cells, Monocytes, Polymorphs
18 Sept, 2022	**Sunday**
4th Week **22 Sept, 2022**	Hypersensitivity and allergic reactions. (Brief only) Autoimmunity, immunological tolerance.
23 Sept,2022	**Shaheedi Divas/ Haryana War Heroes' Martyrdom Day**
24 Sep, 2022	Organs of the Immune System: Primary and Secondary Lymphoid organs- Thymus, Spleen, Lymph nodes
25 Sept, 2022	**Sunday**
5th Week **29 Sept**	Antigens: Concept, Types of Antigens, Antigenic determinants/epitopes, Hapten. Antigen and Immunogen
30 Sept, 2022	**Talent show**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – Kajal Rani
Class- B.Sc. biotechnology Semester III
Subject- Immunology
Paper- VI

October, 2022 **1st Week** **1 Oct,2022**	**Talent Show Holiday**
2 Oct, 2022	**Sunday**
1st Week **6 Oct - 8 Oct**	Antigenecity and Immunogenecity. Factors affecting antigenecity. Antibodies: Structure, Types/Classes, properties and functions of immunoglobulins. Production of antibodies. Antibody diversity (a brief account only).
2nd Week **13 Oct, 2022**	**Karwa Chauth**
14 Oct – 15 Oct, 2022	Antigen – Antibody Interactions: Binding sites, Binding forces, Affinity, Avidity, Cross reactions. Precipitation and Agglutination reactions, RIA, ELISA etc. techniques
3rd Week **16 Oct**	**Sunday**
20 Oct - 21 Oct	Recombinant vaccines (Peptide and DNA vaccines).
22 Oct - 26 Oct	**Diwali Break**
4th Week **27 Oct - 29 Oct**	Immune Response: Introduction, Humoral Immunity – Primary and Secondary immune response
30 Oct, 2022	**Sunday**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – Kajal Rani
Class- B.Sc. biotechnology Semester III
Subject- Immunology
Paper- VI

1st Week **3 Nov – 5 Nov**	B cells in antibody formation (differentiation, maturation and activation of B cells).
6 Nov, 2022	**Sunday**
2nd Week **10 Nov – 12 Nov**	Role of MHC molecules, Antigen presenting cells. Factors influencing antibody formation
3rd Week **17 Nov - 19 Nov**	Cell mediated immunity- Cells involved in CMI, (T-cell subset and surface markers, T-dependent and T-independent antigens, recognition of antigens by T-cells, role of MHC and MHC restriction)
20 Nov, 2022	**Sunday**
4th Week **24 Nov - 26 Nov**	Cytokines and lymphokines, functions of cell mediated immunity. Complement system: Structure, components, properties and functions.
27 Nov, 2022	**Sunday**
5th Week **28 Nov – 3 Dec**	**Sessional Exams**
4 Dec, 2022	**Sunday**
2nd Week **08 Dec - 10 Dec**	Vaccines: concept, types of vaccines- Inactivated, Attenuated
3rd Week **15 Dec, 2022 Onwards**	**University Examination**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – Manpreet Kaur
Class- B.Sc biotechnology Semester III
Subject- Molecular Biology
Paper- VII

2nd Week **5 Sept- 7 Sept**	Nucleic acids: Structure, function and properties of DNA and RNA. Watson and Crick model of DNA. DNA forms (A, B and Z), their characteristic. Different types of RNA, their structure and function. Organization of Genomes – bacterial, viral, human, organelles.
11 Sept, 2022	**Sunday**
3rd Week **12 Sept-14 Sept**	Eukaryotic genomes: Chromosomal organization and structure. Euchromatin, heterochromatin, centromere, telomere. Chromatin structure (nucleosome), histone and non-histone proteins.
18 Sept, 2022	**Sunday**
4th Week **19 Sept-21 Sept**	Insertion elements and transposons; IS elements, transposable elements of Maize and P elements of Drosophila. Extra chromosomal DNA in prokaryotes – plasmids
25 Sept, 2022 **26 Sept, 2022**	**Sunday** **Maharana Agrasen Jayanti**
5th Week **27 Sept - 28 Sept**	DNA Replication: Central dogma of molecular biology. Semi-conservative mode of DNA replication, experimental proof. Unidirectional and bidirectional mode of DNA replication, theta model and rolling circle model.

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – Manpreet Kaur
Class- B.Sc. biotechnology Semester III
Subject- Molecular Biology
Paper- VII

2 Oct, 2022	**Sunday**
1st Week **3 Oct - 5 Oct**	DNA replication in prokaryotes and eukaryotes, different stages, proteins and enzymes involved.
2nd Week **10 Oct - 12 Oct**	DNA damage and repair: causes of DNA damage, mutations. Repair mechanisms- photo reactivation, excision repair, mismatch repair, SOS repair.
3rd Week **17 Oct – 19 Oct**	Genetic Code: concept, elucidation or cracking of genetic code, features of genetic code, Wobble hypothesis.
22 Oct – 26 Oct	**Diwali Break**
30 Oct, 2022	**Sunday**
31 Oct, 2022	**TEST**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – Manpreet Kaur
Class- B.Sc. biotechnology Semester III
Subject- Molecular Biology
Paper- VII

1st Week **2 Nov, 2022**	Transcription in prokaryotes and eukaryotes, diff. stages, mechanism, promoters, transcription factors, RNA polymerases.
2nd Week **7 Nov – 09 Nov**	Post transcriptional modifications- 5' cap formation, 3'-end processing/polyadenylation and gene splicing and generation of mature mRNA. Inhibitors of transcription.
3rd Week **14 Nov - 16 Nov**	Translation/Protein synthesis: Mechanism of initiation, elongation and termination of protein synthesis in prokaryotes and eukaryotes. Inhibitors of translation. Post-translational modifications.
20 Nov, 2022	**Sunday**
4th Week **21 Nov - 23 Nov**	Regulation of Gene Expression in prokaryotes and eukaryotes, induction and repression, positive and negative regulation. Operon model- lac ara, trp, catabolite repression, transcription attenuation.
27 Nov, 2022	**Sunday**
5th Week **28 Nov – 30 Dec**	**Sessional Exams**
4 Dec, 2022	**Sunday**
2nd Week **5 Dec - 07 Dec**	Molecular mechanisms of DNA recombination in eukaryotes – Site Specific and Homologous recombination. Recombination in prokaryotes – Transformation, transduction and conjugation.
3rd Week **15 Dec,2022 Onwards**	**University Examination**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – SONIKA
Class-. B.sc sem 5th biotechnology
Subject- - Animal Biotechnology
Paper -XI

4 Sept, 2022	**Sunday**
2nd Week **8 Sept- 10 Sept**	**Animal Cell & Tissue Culture**: Introduction, Principles & practice. History and Development of animal cell culture. Scope and Applications, Therapeutic products through genetic engineering – blood proteins, insulin, growth hormone etc.
11 Sept, 2022	**Sunday**
3rd Week **15 Sept-17 Sept**	Culture Media: Media components, Serum containing and serum free media.
18 Sept, 2022	**Sunday**
4th Week **22 Sept-24 Sept**	Natural media- Plasma clot, biological fluids, tissue extracts
23 Sept,2022 **25 Sept, 2022** **26 Sept, 2022**	**Shaheedi Divas/ Haryana War Heroes' Martyrdom Day** **Sunday** **Maharana Agrasen Jayanti**
5th Week **29 Sept**	Growth factors required for proliferation of animal
30 Sept, 2022	**Talent show**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – SONIKA
Class- B.sc 5th sem biotechnology
Subject- Animal Biotechnology
Paper- XI

October, 2022 **1st Week** **1 Oct,2022**	**Talent Show Holiday**
2 Oct, 2022	**Sunday**
1st Week **6 Oct - 8 Oct**	Chemically defined media, balanced salt solutions. Physical requirements for growing animal cells in culture. Washing, drying, sterilization practices
5 Oct,2022 **9 Oct,2022**	**Dussehra** **Sunday**
2nd Week **13 Oct - 15 Oct**	various instruments and their uses in animal cell culture practices, Gene Therapy: introduction, types of gene therapy, vectors in gene therapy, major achievements, problems and prospects.
13 Oct, 2022 **16 Oct,2022**	**Karwa Chauth** **Sunday**
3rd Week **20 Oct - 21 Oct**	Primary Cell Culture techniques: Initiation of cell culture-substrates (glass, plastic, metals) their preparation and sterilization
22 Oct - 26 Oct	**Diwali Break**
4th Week **27 Oct - 29 Oct**	Isolation of tissue explants, disaggregation- enzyme disaggregation and mechanical disaggregation of the tissue. Cloning and expression of foreign genes in animal cells: Expression vectors. Over production and preparation of the final product i.e. expressed proteins. Production of vaccines in animal cells
30 Oct, 2022	**Sunday**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – SONIKA
Class- B.sc 5th sem biotechnology
Subject- Animal Biotechnology
Paper- XI

November, 2022 **1st Week** **1 Nov, 2022**	Haryana Day
1st Week **3Nov - 5 Nov**	development of primary culture and cell lines. Subculture. Contamination.. Suspension culture, Growth curve of animal cells in culture, Hybridoma Technology: Production of monoclonal antibodies and their applications
6 Nov, 2022	**Sunday**
2nd Week **10 Nov – 12 Nov**	Secondary cell culture – transformed cell and continuous cell lines. Finite and infinite cell lines. Cell lines, Embryo transfer technology- technique, its applications. Artificial insemination. Animal clones. Transgenic Animals: transgenic sheep, cow, pig, goat etc. Production of transgenic mice, ES cells can be used for gene targeting in mice,
8,9Nov,12, **13 Nov, 2022**	**Sh. Guru Nanak Dev jayanti, elections holiday** **Sunday**
3rd Week **17 Nov - 19 Nov**	Insect and animal cells. Commonly used cell lines- their organization and characteristics. Cell repositories and their function
20 Nov, 2022	**Sunday**
4th Week **24 Nov - 26 Nov**	Karyotyping, biochemical and genetic characterization of cell lines.
27 Nov, 2022	**Sunday**
5th Week **28 Nov – 3 Dec**	**Sessional Exams**
4 Dec, 2022	**Sunday**

2nd Week **8 Dec - 10 Dec**	Organ Culture: technique, advantages, applications and limitations. Artificial skin. Transfection of animal cells: transfection methods. Methods for cell fusion, Selectable markers, HAT selection and Antibiotic resistance
3rd Week **15 Dec,2022 Onwards**	**University Examination**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – BHARTI BINDAL
Class- Bsc. Biotechnology Semester 5th
Subject- PLANT TISSUE CULTURE
Paper- XII

5th Week **27 Sept , 28 Sept**	Production of secondary metabolites in vitro: introduction, technique and utilities. Biotransformation (a brief account only). Plant germ plasm conservation and cryopreservation
30 Sept, 2022	**Talent show**
October, 2022 **1st Week** **1 Oct,2022**	**Talent Show Holiday**
2 Oct, 2022	**Sunday**
1st Week **3 Oct - 4Oct**	**Genetic Engineering in plants**: Introduction, Plant transformation by *Agrobacterium tumefaciens* and *A. rhizogenes*. Ti plasmid. Strategies for gene transfer to plant cells. Binary and cointegrate vectors. selection of hybrids, production of symmetric and asymmetric hybrids and cybrids. Practical applications of somatic hybridization and cybridization.
5 Oct,2022 **9 Oct,2022**	**Dussehra** **Sunday**
2nd Week **10 Oct - 12 Oct**	Gene targeting in plants. Use of plant viruses as vectors (brief account only). Direct DNA transfer/Physical methods of gene transfer in plants - micro projectile bombardment, electroporation, liposome mediated, Calcium phosphate mediated etc
13 Oct, 2022 **16 Oct,2022**	**Karwa Chauth** **Sunday**
3rd Week **17 Oct - 19 Oct**	

	Transgenic Plants: Introduction and applications. Developing insect resistance, bacterial and fungal disease resistance, virus resistance and abiotic stress tolerance in plants
22 Oct - 26 Oct	**Diwali Break**
4th Week **30 Oct**	Improving food quality – nutritional enhancement of plants (carbohydrates, seed storage proteins and vitamins). Plants as Bioreactors: antibodies, polymers, industrial enzymes. Edible vaccines. Protoplast culture: Protoplast isolation, viability test, protoplast culture. Somatic hybridization – protoplast fusion techniques (chemical and electro-fusion),
30 Oct, 2022	**Sunday**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – TWINKLE SUGLA
Class- Bsc. Biotechnology Semester 5th
Subject- PLANT TISSUE CULTURE
Paper- XII

November, 2022 **1st Week** **1 Nov, 2022**	Haryana Day
1st Week **2 Nov**	Introduction/Concept, History, Scope and Applications along with major achievements. Plant Tissue Culture Laboratory: Layout and organization, different work areas, infrastructure/equipments and instruments and other requirements.
6 Nov, 2022	**Sunday**
2nd Week **7 Nov – 9 Nov**	Aseptic Techniques: General sanitation/cleanliness of PTC laboratory and precautions regarding maintenance of aseptic conditions, Washing, drying and sterilization of glassware, sterilization of media, surface sterilization, aseptic work station.
8 Nov,2022 **13 Nov, 2022**	**Sh. Guru Nanak Dev jayanti** **Sunday**
3rd Week **14 Nov - 16 Nov**	Culture Media: Nutritional requirements for plant tissue culture, role of different media components, plant growth regulators, different culture media viz. MS, B_5 Nitsch and White's medium, Preparation of culture media.
20 Nov, 2022	**Sunday**
4th Week **21 Nov - 23 Nov**	In-vitro methods in plant tissue culture: Explants, their cellular characteristics, dedifferentiation and redifferentiation, cellular totipotency, organogenesis and somatic embryogenesis. Micropropagation/clonal propagation of elite species (different routes of multiplication-axillary bud proliferation, somatic embryogenesis, organogenesis), Synthetic seeds (a brief account)

27 Nov, 2022	**Sunday**
5th Week **28 Nov – 3 dec**	**Sessional Exams**
4 Dec, 2022	**Sunday**
2nd Week **5 Dec - 7 Dec**	Callus and suspension culture techniques: Introduction, principle, methodology, application and limitations. Somaclonal variation. Organ culture: Anther & Pollen culture, ovary, ovule, embryo and endosperm culture – concept Technique, applications and limitations. Embryo rescue
3rd Week **15 Dec,2022** **Onwards**	**University Examination**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – BHARTI BINDAL
Class- M. Sc. Biotechnology Ist semester
Subject- BIOMOLECULE
Paper- BT-101

1st Week **2 Nov - 5 Nov**	WATER :Structure, hydrogen bonding, as a biological solvent, ionization and fitness of the aqueous environment for living organisms pH; Buffers; Henderson-Hasselbalch equation; Physiological buffers
6 Nov, 2022	**Sunday**
2nd Week **7 Nov – 12 Nov**	CARBOHYDRATES : Structure, occurrence and biological importance of important monosaccharides, oligosaccharides and polysaccharides; Ring structures and anomeric forms; mutarotation; sugar derivatives; reactions of monosaccharides; Glycosaminoglycans; Heteropolysaccharides of bacterial and algal cell walls; Proteoglycans; Glycoproteins; Lectins.
8 Nov,2022 **13 Nov, 2022**	**Sh. Guru Nanak Dev jayanti** **Sunday**
3rd Week **14 Nov - 19 Nov**	AMINO ACID AND PROTEIN :Common structural features, classification by R group, Zwitter ion structures, acid-base properties and titration curves of amino acids; Essential amino acids; Separation of amino acids; Peptides including biologically active peptides; Classification and different structural levels (Primary, secondary, tertiary & quaternary) of proteins; Ramachandran plot;
20 Nov, 2022	**Sunday**
4th Week **21 Nov - 26 Nov**	Determination of amino acid composition of proteins; Characteristic amino acid composition of proteins; Determination of amino acid sequences of proteins; Effect of amino acid sequence on the function of a protein and stability of α-helix; Protein folding and role of chaperons in protein folding; Chemical synthesis of polypeptides
27 Nov, 2022	**Sunday**
5th Week **28 Nov – 3 Dec**	. LIPIDS :Classification, structures, nomenclature and properties of fatty acids; Essential fatty acids; Acylglycerols; Characterization of fats-

	Saponification value, iodine number, rancidity, acid value,Reichert-Meissel number;
4 Dec, 2022	**Sunday**
2nd Week **5 Dec - 10 Dec**	Structures and properties of different types of phospholipids and sphingolipid (sphingomyelins, cerebrosides & gangliosides); Structure and functions of prostaglandins, Prostacyclins, Thromboxanes, and Leukotrienes; Terpenes of biological significance Sterols and bile acids.
3rd Week **12 Dec- 17 Dec**	.NUCLEIC ACIDS : Structure and properties of purines and pyrimidine bases; Nucleosides and Nucleotides; Biologically important nucleotides; Nucleic acids as the genetic material – experimental evidences; Chargaff's rules
4th Week **19 Dec -24 Dec**	**Sessional Exams**
5th Week **26 Dec – 31 Dec**	The covalent backbone of nucleic acids; Double helical model of DNA structure; Structural polymorphism of DNA (A,B and Z-DNA) and RNA; Denaturation & annealing of DNA; Biological functions of nucleotides; Chemical synthesis of oligonucleotides.
1st Week **1 Jan – 7 Jan**	**TEST AND REVISION**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – Manpreet Kaur
Class- M. Sc. Biotechnology Ist semester
Subject- Microbiology
Paper- BT-102

1st Week **2 Nov - 5 Nov**	Various branches and applications of Microbiology, History and contributions of various scientists to this science with particular reference to the contribution of the following scientists- A.V.Leeuwenhoek, Louis Pasteur, Edward Jenner, Robert Koch, Alexander Fleming and Joseph Lister.
6 Nov, 2022	**Sunday**
2nd Week **7 Nov – 12 Nov**	Morphology and arrangement of bacterial cells, Bacterial- flagella, Fimbriae, capsule, spores and cysts, cell walls of Gram +ve and Gram –ve bacteria, Nutritional requirements and nutritional categories of microorganisms, Physical factors for growth,
8 Nov,2022 **13 Nov, 2022**	**Sh. Guru Nanak Dev jayanti** **Sunday**
3rd Week **14 Nov - 19 Nov**	Distinguishing features of bacteria, viruses, fungi, protozoa, algae. Criteria used for characterization including molecular approaches, Classification, Nomenclature and Identification of microorganisms,taxonomy and nomenclature based upon Bergey's manual;
20 Nov, 2022	**Sunday**
4th Week **21 Nov - 26 Nov**	Gram (+) and Gram (-) bacteria of medical and industrial importance (Pseudomonas, Azotobacter, Rhizobium, Agrobacterium); characteristics of Mycobacterium and Mycoplasmas; photosynthetic prokaryotes (purple bacteria, green bacteria, cyanobacteria) and actinomycetes;
27 Nov, 2022	**Sunday**
5th Week **28 Nov – 3 Dec**	brief account of different types of viruses with special reference to lambda phage, herpes, adenoviruses and retroviruses, viriods and prions; fungi and algae of industrial importance.

4 Dec, 2022	**Sunday**
2nd Week **5 Dec - 10 Dec**	Sterilization methods- dry heat, moist heat, radiations, filtration, gaseous sterilization, Validation of sterilization processes; Factors affecting antimicrobial action, Mode of action of antimicrobial agents, Antibiotics and their mode of action, Microbiological assay of antibiotics (ampicillin, streptomycin, tetracycline etc.), Disinfectants; Types of toxins and their mode of action.
3rd Week **12 Dec- 17 Dec**	Microbial ecology: Biogeochemical cycles; Physical environment: Microenvironment & Niche Microorganisms and ecosystems. Soil microbiology: Types & functions of microorganisms in soil.
4th Week **19 Dec -24 Dec**	**Sessional Exams**
5th Week **26 Dec – 31 Dec**	Microorganism associations with vascular plants (Mycorrhizae, rhizobia) Microorganism growth in goods, good spoilage & control, good born diseases.
1st Week **1 Jan – 7 Jan**	**TEST AND REVISION**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – SONIKA
Class- M.SC Ist BIOTECHNOLOGY
Subject- MOLCELL BIOTECHNOLOGY
Paper- Paper BT-103

1nd Week **4 ,5 November**	**Overview of cells and cell research:** Origin and evolution of cells, Cells as experimental models, tools of cell biology.
2ND Week **7th -12 November**	**Fundamentals of Molecular Biology**: Heredity, Genes, and DNA, Expression of Genetic Information
13, November 2022	**Sunday**
3rd Week **14th -19November**	Recombinant DNA, Detection of Nucleic Acids and Proteins, Gene Function in Eukaryotes
20th November 2022	**Sunday**
4th week 21-26November	**Nucleus**: Nuclear envelope and traffic between the nucleus and cytoplasm, internal organization of the nucleus, nucleolus, nucleus during mitosis
20th November 2022	**Sunday**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – SONIKA
Class- M.SC Ist BIOTECHNOLOGY
Subject- MOLCELL BIOTECHNOLOGY
Paper- BT-103

October, 2022 **1st Week** **1 Oct,2022**	**Talent Show Holiday**
2 Oct, 2022	**Sunday**
1st Week **3 Oct - 8 Oct**	**Nucleus**: Nuclear envelope and traffic between the nucleus and cytoplasm, internal organization of the nucleus, nucleolus, nucleus during mitosis
5 Oct,2022 **9 Oct,2022**	**Dussehra** **Sunday**
2nd Week **10 Oct - 15 Oct**	**Protein Sorting and Transport**
13 Oct, 2022 **16 Oct,2022**	**Karwa Chauth** **Sunday**
3rd Week **17 Oct - 21 Oct**	Endoplasmic reticulum, Golgi apparatus, and Lysosomes,
22 Oct - 26 Oct	**Diwali Break**
4th Week **27 Oct - 31 Oct**	mechanism of vesicular transport
30 Oct, 2022	**Sunday**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – SONIKA
Class- M.SC Ist BIOTECHNOLOGY
Subject- Molcell BIOTECHNOLOGY
Paper - BT-103

November, 2022 **1st Week** **1 Nov, 2022**	Haryana Day
1st Week **2 Nov - 5 Nov**	**DNA Replication:** DNA polymerases, replication fork, fidelity of replication, origins and initiation of replication,.
6 Nov, 2022	**Sunday**
2nd Week **7 Nov – 12 Nov**	replication at the ends of chromosomes
8,9Nov,12, **13 Nov, 2022**	**Sh. Guru Nanak Dev jayanti,elections hoilday** **Sunday**
3rd Week **14 Nov - 19 Nov**	**DNA Repair:** Direct reversal of DNA damage, excision repair, error-prone repair, recombinational repair.
20 Nov, 2022	**Sunday**
4th Week **21 Nov - 26 Nov**	**RNA Synthesis and Processing:** Prokaryotic transcription, Eukaryotic transcription: RNA polymerases and transcription factors, RNA processing and turnover
27 Nov, 2022	**Sunday**
5th Week **28 Nov – 3 Dec**	**Sessional Exams**
4 Dec, 2022	**Sunday**
2nd Week **5 Dec - 10 Dec**	**Protein Synthesis, Processing and Regulation:** Translation of mRNA, Protein folding and processing, regulation of protein function, protein degradation

3rd Week **12 Dec- 17 Dec**	**Cell Signaling**: Signaling molecules and their receptors, functions of cell surface receptors, pathways of intracellular signal transduction, signal transduction and cytoskeleton, signaling in development and differentiation.
4th Week **19 Dec -24 Dec**	**Sessional Exams**
5th Week **26 Dec – 31 Dec**	**Cell death and cell renewal:** programmed cell death, stem cells and maintenance of adult tissues. Embryonic stem cells and therapeutic cloning.
1st Week **1 Jan – 7 Jan**	**TEST AND REVISION**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher- Twinkle Sugla
Class- M. Sc. Biotechnology Ist semester
Subject- Biotechniques
Paper- BT-104

1st Week **2 Nov - 5 Nov**	**Cell Separation, disruption, extraction and concentration techniques:** Microfiltration, Centrifugation, Ultrasonication, High pressure Homogenisation, Bead Milling, Ultrafiltration, Diafiltration and their applications
6 Nov, 2022	**Sunday**
2nd Week **7 Nov – 12 Nov**	reverse osmosis, Lyophilisation. **Centrifugation Methods:** Principles of Sedimention, centrifugation techniques and their applications, differential centrifugation, density gradient and ultracentrifugation techniques
8 Nov,2022 **13 Nov, 2022**	**Sh. Guru Nanak Dev jayanti** **Sunday**
3rd Week **14 Nov - 19 Nov**	**Microscopy:** Light Microscopy – Magnification, Resolving power, Numerical aperture, Limit of Resolution, Principles and applications of bright field, phase contrast, fluorescence, scanning and transmission electron microscopy
20 Nov, 2022	**Sunday**
4th Week **21 Nov - 26 Nov**	**Spectroscopy:** Principles of biophysical methods used for analysis of biopolymer structure -X-ray diffraction, fluorescence, UV and visible, ORD/CD, NMR and ESR spectroscopy, Atomic absorption and Atomic emission spectroscopy
27 Nov, 2022	**Sunday**
5th Week **28 Nov – 3 Dec**	. **Chromatography:** Principles and applications of Paper, Thin layer, Gel-filtration, ion-exchange, Affinity chromatography, Gas liquid chromatography, High pressure liquid chromatography (HPLC); Reversed Phase chromatography ,Hydrophobic interaction chromatography.
4 Dec, 2022	**Sunday**

2nd Week **5 Dec - 10 Dec**	**Electrophoresis:** Concept, Factors affecting electrophoresis, Agarose gel electrophoresis, Pulse field gel electrophoresis, PAGE, SDS-PAGE, ,Isoelectrofoccusing , 2 Dimentional electrophoresis
3rd Week **12 Dec- 17 Dec**	**Radioisotope Techniques:** Radioactivity, Units of radioactivity, Radioactive decay, Rate of radioactive decay, Measurement of radioactivity- Geiger counter, Lequid scintillation counting, Autoradiography,
4th Week **19 Dec -24 Dec**	**Sessional Exams**
5th Week **26 Dec – 31 Dec**	Effect of radiations on biological system, Cerenkov radiations, Tracer technique-Principle and applications
1st Week **1 Jan – 7 Jan**	**TEST AND REVISION**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – Manpreet Kaur
Class- M.Sc. biotechnology Semester III
Subject- Molecular Genetics
Paper- BT-114

August, 2022 **5th Week** **29 Aug – 31Aug**	**Eukaryotic Genome Structure and Organization** Packaging of DNA into chromosomes, Special features of metaphase Chromosomes
September, 2022 **1st Week** **1 Sept-3 Sept**	Chromosome banding, Genome size and complexity, Gene organization, Multigene families, Pseudo genes, Repetitive DNA, Chromatin domains, Chromatin modifications
4 Sept, 2022	**Sunday**
2nd Week **5 Sept- 10 Sept**	**The Mutability of DNA** An overview of mutation and polymorphism, VNTR polymorphism, Hot spots, DNA damage- spontaneous, Induced (Alkylation, oxidation, radiation), Genotoxicity/ mutagenicity test systems (Ames test, Sister chromatid exchanges, Micronucleus, Comet assay) + Practical
11 Sept, 2022	**Sunday**
3rd Week **12 Sept-17 Sept**	**Transcription Regulation in Prokaryotes** Positive and negative control of transcription, Repression and activation, Organization and regulation of Lac, Trp and Ara operon in *E. coli.* + Practical
18 Sept, 2022	**Sunday**
4th Week **19 Sept-24 Sept**	**Transcription Regulation in Eukaryotes** Eukaryotic activators, DNA binding domains, Transcriptional repressors, Signal transduction and control of transcriptional regulators
23 Sept,2022 **25 Sept, 2022** **26 Sept, 2022**	**Shaheedi Divas/ Haryana War Heroes' Martyrdom Day** **Sunday** **Maharana Agrasen Jayanti**
5th Week **27 Sept - 29 Sept**	**Regulatory RNAs** Riboswitches, Interfering RNA (RNAi) and gene expression, Short interfering RNA (si RNA) and its fuctions, Micro RNA and its fuctions, Antisense RNA and gene expression
30 Sept, 2022	**Talent show**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – Manpreet Kaur
Class- M.Sc. biotechnology Semester III
Subject- Molecular Genetics
Paper- BT-114

October, 2022 **1st Week.** **1 Oct,2022**	**Talent Show Holiday**
2 Oct, 2022	**Sunday**
1st Week **3 Oct - 8 Oct**	**Site-Specific Recombination and Transposition** Concept, Recombinases and their function, cre-lox recombination, Biological role of site specific recombination, Classes of transposable elements-DNA transposons, Virus like transposons, Non viral retro transposons + Practical
5 Oct,2022 **9 Oct,2022**	**Dussehra** **Sunday**
2nd Week **10 Oct - 15 Oct**	**Genome Mapping** Shot gun approach, Clone contig approach, DNA markers for genetic mapping, RFLP, SSP, SNPs, Physical mapping-Restriction mapping, Florescent *in situ* hybridization (FISH), Sequence tagged sites (STS) mapping + Practical
13 Oct, 2022 **16 Oct,2022**	**Karwa Chauth** **Sunday**
3rd Week **17 Oct - 21 Oct**	**Genome Sequencing** High throughput sequencing, Clone by clone approach, whole genome shot gun sequencing + Practical
22 Oct - 26 Oct	**Diwali Break**
4th Week **27 Oct - 31 Oct**	**Comparative Genomics** Concept, Comparative genomics of eukaryotes and its role in evolution + Test + Practical
30 Oct, 2022	**Sunday**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – Manpreet Kaur
Class- M.Sc. biotechnology Semester III
Subject- Molecular Genetics
Paper- BT-114

November, 2022 **1st Week** **1 Nov, 2022**	**Haryana Day**
1st Week **2 Nov – 5 Nov**	**Transcriptome Analysis** Transcriptome, Rapid Amplification of cDNA ends (RACE), SAGE, DNA microarrays
6 Nov, 2022	**Sunday**
2nd Week **7 Nov – 12 Nov**	Organization of genome in lambda phage, Regulation of lytic cascade, Antitermination, Repressor proteins, Establishment of lysogeny, Balance between lysogeny and lytic cycle. + Practical
8 Nov,2022 **13 Nov, 2022**	**Sh. Guru Nanak Dev jayanti** **Sunday**
3rd Week **14 Nov - 19 Nov**	Signature Tagged Mutagenesis (STM), Gene trap vector, Gene conversion, Gene silencing, Epigenetic gene regulation + Test + Practical
20 Nov, 2022	**Sunday**
4th Week **21 Nov - 26 Nov**	Mechanism of DNA and RNA mediated transposition + Test + Practical
27 Nov, 2022	**Sunday**
5th Week **28 Nov – 3 Dec**	**Sessional Exams**
4 Dec, 2022	**Sunday**
2nd Week **5 Dec - 10 Dec**	**Revision**
3rd Week **15 Dec,2022 Onwards**	**University Examination**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – BHARTI BINDAL
Class- M.Sc. biotechnology Semester III
Subject- PLANT BIOTECH
Paper- BT-115

5th Week **27 Sept - 29 Sept**	Organization of plant genome – Nuclear genome, Chloroplast genome and mitochondrial genome. Transposon and T – DNA tagging
30 Sept, 2022	**Talent show**
October, 2022 **1st Week.** **1 Oct,2022**	**Talent Show Holiday**
2 Oct, 2022	**Sunday**
1st Week **3 Oct - 8 Oct**	Chloroplast transformation – vector designing, method and advantages *Agrobacterium* mediated transformation – Ti and Ri plasmids, role of virulence genes, mechanism of T-DNA transfer, vectors based on Ti and Ri plasmids – cointegrate and binary vectors, technique and factors affecting *Agrobacterium* mediated transformation of plants
5 Oct,2022 **9 Oct,2022**	**Dussehra** **Sunday**
2nd Week **10 Oct - 15 Oct**	Direct gene transfer – particle bombardment, PEG-mediated, electroporation, microinjection and alternative methods. Screenable and selectable markers, molecular characterization of transformants. Marker free methodologies, methods for multiple gene transfer in plants. Gene silencing in transgenic plants
13 Oct, 2022 **16 Oct,2022**	**Karwa Chauth** **Sunday**
3rd Week **17 Oct - 21 Oct**	Viral resistance; Fungal resistance; Insect resistance; Herbicide resistance; Various abiotic stresses (like drought, salinity, temperature and flooding).
22 Oct - 26 Oct	**Diwali Break**
4th Week **27 Oct - 31 Oct**	Production of medically related proteins in plants, nutritional enhancement of plants (carbohydrates, seed storage proteins, vitamins), manipulation of flower colors and other value addition compounds (like industrial enzymes).
30 Oct, 2022	**Sunday**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher- BHARTI BINDAL
Class- M.Sc. biotechnology Semester III
Subject- PLANT BIOTECHNOLOGY
Paper- BT-115

November, 2022 **1st Week** **1 Nov, 2022**	**Haryana Day**
1st Week **2 Nov – 5 Nov**	Production of useful secondary metabolites through plant cell cultures; Strategies used for high yield of product – development and selection of high yieldingcell line cultures
6 Nov, 2022	**Sunday**
2nd Week **7 Nov – 12 Nov**	optimization of factors affecting yield of plant cells (physical culture conditions, media and other biochemicals), bioreactors and immobilized plant cell culture, biotransformation, permeabilization of cells and removal of secreted products
8 Nov -13 Nov	**Sh. Guru Nanak Dev jayanti** **Sunday**
3rd Week **14 Nov - 19 Nov**	Intellectual property rights (IPR); Patents, trade secrets, copyright, trademarks; Plant genetic resources; GATT & TRIPPS; Patenting of biological material;
20 Nov, 2022	**Sunday**
4th Week **21 Nov - 26 Nov**	Patenting of transgenic organisms 29 and genes; Plant breeders rights (PBRs) and farmers rights; Concerns about GM crops– environmental, biosafety and ethics**.**
27 Nov, 2022	**Sunday**
5th Week **28 Nov – 3 Dec**	**Sessional Exams**
4 Dec, 2022	**Sunday**
2nd Week **5 Dec - 10 Dec**	**Revision**
3rd Week **15 Dec,2022** **Onwards**	**University Examination**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – SONIKA
Class- M.SC IInd BIOTECHNOLOGY
Subject- MICROBIAL BIOTECHNOLOGY
Paper- Paper BT-116

4 Sept, 2022	**Sunday**
2nd Week **5 Sept- 10 Sept**	Kinetics of microbial growth and product formation Fermentation system; batch and continuous system, fed batch system, multistage system
11 Sept, 2022	**Sunday**
3rd Week **12 Sept-17 Sept**	Solid state fermentation. Overproduction of primary and secondary metabolites
18 Sept, 2022	**Sunday**
4th Week **19 Sept-24 Sept**	Fermentation raw materials: Media for industrial fermentations; criteria used in media formulation
23 Sept,2022 **25 Sept, 2022** **26 Sept, 2022**	**Shaheedi Divas/ Haryana War Heroes' Martyrdom Day** **Sunday** **Maharana Agrasen Jayanti**
5th Week **27 Sept - 29 Sept**	Fermenter/bioreactor design and operation; types of fermentor, stirred tank reactor
30 Sept, 2022	**Talent show**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – SONIKA
Class- M.SC IInd BIOTECHNOLOGY
Subject- MICROBIAL BIOTECHNOLOGY
Paper- Paper BT-116

October, 2022 **1st Week** **1 Oct,2022**	**Talent Show Holiday**
2 Oct, 2022	**Sunday**
1st Week **3 Oct - 8 Oct**	bubble column reactor, airlift reactor, packed bed reactor, fluidized bed reactor
5 Oct,2022 **9 Oct,2022**	**Dussehra** **Sunday**
2nd Week **10 Oct - 15 Oct**	trickle bed reactor, agitation and aeration in a reactor, mass transfer. Foam formation
13 Oct, 2022 **16 Oct,2022**	**Karwa Chauth** **Sunday**
3rd Week **17 Oct - 21 Oct**	Industrial production of alcohol (ethanol, wine and beer) and improvement by genetic engineering
22 Oct - 26 Oct	**Diwali Break**
4th Week **27 Oct - 31 Oct**	Microbial production of acids (citric, acetic and gluconic acid) solvents (glycerol acetone and butanol
30 Oct, 2022	**Sunday**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – SONIKA
Class- M.SC IInd BIOTECHNOLOGY
Subject- MICROBIAL BIOTECHNOLOGY
Paper Paper BT-116-

November, 2022 **1st Week** **1 Nov, 2022**	Haryana Day
1st Week **2 Nov - 5 Nov**	aminoacids (lysine and glutamic acid).Production of antibiotics ; Penicillin and cephalosporin
6 Nov, 2022	**Sunday**
2nd Week **7 Nov – 12 Nov**	Microbial polysaccharides: fermentative production of xanthan gums,. Bacterial bioplastics
8,9Nov,12, **13 Nov, 2022**	**Sh. Guru Nanak Dev jayanti,elections hoilday** **Sunday**
3rd Week **14 Nov - 19 Nov**	genetic engineering of microorganisms for the production of poly-3 hydroxyalkanoates
20 Nov, 2022	**Sunday**
4th Week **21 Nov - 26 Nov**	Microbial inoculants: Food starter cultures; baker's yeast, starter cultures for the dairy industry, meat starter cultures
27 Nov, 2022	**Sunday**
5th Week **28 Nov – 3 Dec**	**Sessional Exams** microbial inoculants; Microbial transformation of steroids and sterols.
4 Dec, 2022	**Sunday**
2nd Week **5 Dec - 10 Dec**	Biomass production: single cell protein (SCP) production
3rd Week **15 Dec,2022** **Onwards**	**University Examination**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – Kajal Rani
Class- M.Sc. Semester III
Subject- Immunology
Paper- Paper BT-117

August, 2022 **4th Week** **23 Aug – 27 Aug**	**Introduction and overview** Introduction and overview of immunology, cells of immune system, innate and cellular immunity, physical and chemical barriers , cellular defenses, inflammation,
5th Week **29 Aug – 31Aug**	Receptors involved in innate immune system, cells and organs involved in adaptive immune response
September, 2022 **1st Week** **1 Sept-3 Sept**	**Test +** Fate of antigen after penetration, interrelationship between innate and acquired immunity.
4 Sept, 2022	**Sunday**
2nd Week **5 Sept- 10 Sept**	**Antigens, antibodies and their interactions** Requirements of immunogenicity, primary and secondary responses, major classes of antigens basic structure of antibodies, antibody classes and biological activity, antigenic determinants on immunoglobulins,
11 Sept, 2022	**Sunday**
3rd Week **12 Sept-17 Sept**	**Test +** Organization and expression of immunoglobulin genes, antigen-antibody interactions: immunoprecipitation, agglutination, ELISA,
18 Sept, 2022	**Sunday**
4th Week **19 Sept-24 Sept**	**Generation of B- cell and T- cell responses** Biology of B lymphhocytes: introduction, ontogeny, B cell membrane proteins,
23 Sept,2022 **25 Sept, 2022** **26 Sept, 2022**	**Shaheedi Divas/ Haryana War Heroes' Martyrdom Day** **Sunday** **Maharana Agrasen Jayanti**
5th Week **27 Sept - 29 Sept**	Biology of T cells: antigen specific T cell receptors, T cell differentiation, thymic selection, role of major histocompatibility complex in immune response
30 Sept, 2022	**Talent show**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – Kajal Rani
Class- M.Sc. biotechnology Semester III
Subject- Immunology
Paper- Paper BT-117

October, 2022 **1st Week.** **1 Oct,2022**	**Talent Show Holiday**
2 Oct, 2022	**Sunday**
1st Week **3 Oct - 8 Oct**	Activation and function of T and B cells, cytokines,
5 Oct,2022 **9 Oct,2022**	**Dussehra** **Sunday**
2nd Week **10 Oct - 15 Oct**	**Test +** **Immune system in health and disease** Hybridoma technology: commercial production of antibodies using monoclonal antibodies.
13 Oct, 2022 **16 Oct,2022**	**Karwa Chauth** **Sunday**
3rd Week **17 Oct - 21 Oct**	Vaccines: live attenuated, killed, subunit, conjugate and DNA vaccines.
22 Oct - 26 Oct	**Diwali Break**
4th Week **27 Oct - 31 Oct**	Development of diagnostics and immunoprophylactics using biotech and nanotech tools
30 Oct, 2022	**Sunday**

KVA DAV College for Women, Karnal

Lesson Plan for the Odd Semester
(September to December, 2022)

Name of the Teacher – Twinkle Sugla
Class- M.Sc. biotechnology Semester III
Subject- Immunology
Paper- Paper BT-117

November, 2022 **1st Week** **1 Nov, 2022**	**Haryana Day**
1st Week **2 Nov – 5 Nov**	**Test+** Immunofluorescence, flow cytometry
6 Nov, 2022	**Sunday**
2nd Week **7 Nov – 12 Nov**	Signal transduction molecules associated with membrane immunoglobulins,
8 Nov,2022 **13 Nov, 2022**	**Sh. Guru Nanak Dev jayanti** **Sunday**
3rd Week **14 Nov - 19 Nov**	Complement system. Immunoglobulin super family,
20 Nov, 2022	**Sunday**
4th Week **21 Nov - 26 Nov**	Production of recombinant antibodies and edible vaccines,
27 Nov, 2022	**Sunday**
5th Week **28 Nov – 3 Dec**	**Sessional Exams**
4 Dec, 2022	**Sunday**
2nd Week **5 Dec - 10 Dec**	**Revision**
3rd Week **15 Dec,2022** **Onwards**	**University Examination**