SRI VENKATESWARA UNIVERSITY :: TIRUPATI

FIRST YEAR B.Sc. MICROBIOLOGY
FIRST SEMESTER

Revised Syllabus Under CBCS W.E.F. 2020-21

STRUCTURE

YEAR	SEMESTER	PAPER	TITLE	MARKS	CREDITS
I	I	MBT - I	INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY	100	
		MBP – I	INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY	50	
	II	MBT – II	MICROBIAL PHYSIOLOGY AND BIOCHEMISTRY	100	
		MBP – II	MICROBIAL PHYSIOLOGY AND BIOCHEMISTRY	50	

SRI VENKATESWARA UNIVERSITY :: TIRUPATI

FIRST YEAR B.Sc. MICROBIOLOGY
FIRST SEMESTER

Revised Syllabus Under CBCS W.E.F. 2020-21

MBT- I: INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY

TOTAL HOURS:48 **CREDITS: 4**

UNIT-I: **No. of hours: 13**

History and mile stones in microbiology. Contributions of Anton von Leeuwenhoek, Edward Jenner, Louis Pasteur, Robert Koch, Ivanowsky. Importance and applications of microbiology. Binomial Nomenclature ,Baltimore classification,Whittaker's five kingdom and Carl Woese's three kingdom classification ,outlines of Bergey's Manual of Systematic Bacteriology, General characteristics of Bacteria, Archaea, Mycoplasmas, Cyanobacteria, Fungi, Algae, Protozoa and viruses with an emphasis on distribution and occurrence, morphology, mode of reproduction and economic importance and outline classification

UNIT-II: **No. of hours: 8**

Methods of sterilization: Physical methods – Dry heat, moist heat, radiation methods, filtration methods, Chemical methods and their application.

Microbial cultures: Concept of pure culture, Methods of pure culture isolation, Enrichment culturing techniques, single cell isolation, and pure culture development.

Preservation of microbial cultures: subculturing, overlaying cultures with mineral oils, lyophilization, and cultures storage at low temperatures.

UNIT-III: **No. of hours: 7**

Staining Techniques - Simple and Differential staining techniques. **Principles of microscopy** - Bright field and Electron microscopy (SEM and TEM).Nutritional types of bacteria. **Microbiological media**-Natural and synthetic basal, defined, complex, enrichment, selective, differential, maintenance and transport media.

UNIT-IV: **No. of hours:10**

Microbial growth: Principles of growth, Kinetics of growth, Methods of measuring growth: **Direct methods**: viable plate counts, membrane filtration. **Indirect methods**: Metabolic activity – measurements of DNA, Protein, Microscopic counts, electronic counters, most probable number; Batch and continuous growth, Synchronous culture, Diauxic growth, Types of cultures-stock, batch, continuous and synchronous cultures. Cultivation of aerobes and anaerobes. Reproduction in bacteria and spore formation.

UNIT-V: **No. of hours: 10**

Ultra structure of Prokaryotic cell- Variant components and invariant components. Cell wall of bacteria and fungi- Gram positive cell wall, Gram negative cell wall, Cell wall of fungi and yeasts._Morphology, Ultrastructure and chemical composition of bacteria, Actinomycetes, Spirochetes, Rickettsiae, Mycoplasma, Chlamydiae. Economic importance of algae and fungi. SCP.

MBP- I: INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY

TOTAL HOURS: 30 **CREDITS: 2**

1. Microbiology Good Laboratory Practices and Biosafety.
2. Principle, application and handling of laboratory equipments- Autoclave, Hot air oven, Incubators, Bio safety cabinets, Light microscopes, pH meter
3. Preparation and sterilization of culture media (liquid and Solid)for cultivation of bacteria
4. Preparation and sterilization of culture media for cultivation of fungi
5. Microscopic observation of bacteria, Cyanobacteria, Algae, protozoa and Fungi from natural habitats.
6. Simple staining
7. Negative staining
8. Gram's staining
9. Study of bacterial motility by Hanging-drop method.
10. Isolation of pure cultures of bacteria by streaking method.
11. Enumeration of CFU count by spread plate method/pour plate method.
12. Preservation of bacterial cultures by various techniques.

SUGGESTED READING:

- Madigan,Martinko, Bender,Buckley,Stahl.Brock Biology of Microorganisms. Pearson,2002
- Pelczar, M.J., Chan, E.C.S. and Kreig, N.R. (1993). Microbiology. 5th Edition, Tata Mc Graw Hill Publishing Co., Ltd., New Delhi.
- Dube, R.C. and Maheswari, D.K. (2000) General Microbiology. S Chand, New Delhi. Edition), Himalaya Publishing House, Mumbai.

- Power, C.B. and Daginawala, H.F. (1986). General Microbiology Vol I & II
- Prescott, M.J., Harley, J.P. and Klein, D.A. (2010). Microbiology. 5th Edition, WCB Mc Graw Hill, New York.
- Reddy, S.M. and Reddy, S.R. (1998). Microbiology Practical Manual, 3rd Edition, Sri Padmavathi Publications, Hyderabad.
- Singh, R.P. (2007). General Microbiology. Kalyani Publishers, New Delhi.
- Stanier, R.Y., Adelberg, E.A. and Ingram, J.L. (1991). General Microbiology, 5th Ed., Prentice Hall of India Pvt. Ltd., New Delhi.
- Microbiology Edited by Prescott
- Jaya Babu (2006). Practical Manual on Microbial Metabolisms and General Microbiology. Kalyani Publishers, New Delhi.
- Gopal Reddy *et al.,* Laboratory Experiments in Microbiology

SRI VENKATESWARA UNIVERSITY

B.Sc. DEGREE COURSE IN MICROBIOLOGY

W.E.F. 2020-21

MODEL QUESTION PAPER

Time: 3 hours Marks: 75 marks

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer any five of the following questions in Part A.
Part B consists of 5 Units. Answer one full question (A or B) from each unit (i.e., Q.No 9 from Unit – I, Q.No 10 from Unit – II, Q.No 11 from Unit – III, Q.No 12 from Unit – IV, Q.No 13 from Unit – V). Each question carries 10 marks.

PART – A

Answer any *Five* of the following question. (5X5=25M)

1.	
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(P.T.O)

PART – B

Answer All The Questions. Each question carries 10 marks (5X10= 50M)

9.	(A) OR (B)
10.	(A) OR (B)
11.	(A) OR (B)
12.	(A) OR (B)
13.	(A) OR (B)

SRI VENKATESWARA UNIVERSITY
B.Sc. DEGREE COURSE IN MICROBIOLOGY
FIRST YEAR - SECOND SEMESTER
(Revised Syllabus under CBCS w.e.f. 2020-21)

MBT – II: MICROBIAL PHYSIOLOGY AND BIOCHEMISTRY

TOTAL HOURS: 48 **CREDITS: 4**

UNIT-I: No. of hours: 12

Concept of bio-molecules - Building blocks of life, Macromolecules. **Concept of Bioenergetics** - First and second laws of Thermodynamics.Definitions of Gibb's Free Energy, enthalpy and Entropy and mathematical relationship among them.**Carbohydrates** – Classification, chemistry, properties, and function– mono, di, oligo and polysaccharides. **Lipids** – classification, chemistry, properties and function – free fatty acids,triglycerides, phospholipids, glycolipids &waxes

UNIT-II: No. of hours: 9

Aminoacids –classification, structure and function. Essential amino Acids & amphoteric nature of amino acids and reactions and functions of carboxyl and amino groups and side chains. **Proteins**– isolation and characterization of proteins. Structural levels of proteins– primary, secondary, tertiary and quaternary, denaturation of proteins. Hydrolysis of proteins. Outlines of Protein sequencing using various methods.

UNIT – III: No. of hours: 9

Nucleic acids–structure, function and their properties. Structural polymorphism of DNA, RNA. Chemical structure and base composition of nucleic acids, Chargaff's rules, Watson Crick Model (B-DNA), deviations from Watson-Crick model, other forms of DNA (A- and Z-DNA), forces stabilizing nucleic acid structures, (hydrogen bonds and hydrophobic associations, base stacking). Structural characteristics of RNA. Types of RNA.

UNIT – IV: No. of hours: 9

Aerobic respiration - Glycolysis, HMP path way, ED path way, TCA cycle, Electron transport, oxidative and substrate level phosphorylation. Kreb'scycle, glyoxylatecycle, hexose monophosphate (HMP) shunt, gluconeogenesis.

Anaerobic respiration Fermentation, Biochemical mechanisms of lacticacid, ethanol, butanol and citricacid fermentations. Nitrate and sulphate respiration. Outlines of oxygenic and anoxy genic photosynthesis in bacteria.

UNIT- V: No. of hours: 9

Properties and classification of Enzymes. Biocatalysis- induced fit and lock and key models. Coenzymes and Cofactors. Factors affecting catalytic activity.

Inhibition of enzyme activity- competitive, noncompetitive, uncompetitive and allosteric.

Enzyme kinetics: Michaelis-Menten equation, effect of substrate concentration, effect of enzyme concentration, effect of p H and temperature, temperature.

SRI VENKATESWARA UNIVERSITY
B.Sc. DEGREE COURSE IN MICROBIOLOGY
FIRST YEAR - SECOND SEMESTER
(Revised Syllabus under CBCS w.e.f. 2020-21)

MBP – II: MICROBIAL PHYSIOLOGY AND BIOCHEMISTRY

TOTAL HOURS: 30 **CREDITS: 2**

1. Qualitative Analysis of Carbohydrates.
2. Qualitative Analysis of Aminoacids.
3. Colorimetric estimation DNA by diphenylamine method.
4. Estimation of RNA by Orcinol method.
5. Colorimetric estimation of proteins by Biuret / Lowry method.
6. Estimation of reducing sugar-Anthrone method.
7. Estimation of sugar by titration method–Benedict's method.
8. Determination of pKa and pI values of amino acids.
9. Assay of amylase activity
10. Effect of temperature / pH on enzyme activity
11. Demonstration of alcoholic fermentation.

SUGGESTED READING:

- Tortora, G.J., Funke, B.R and Case, C.L. Microbiology: An Introduction. Pearson Education, Singapore, (2004)
- Berg JM, Tymoczko JL and Stryer L (2011) Biochemistry, W.H.Freeman and Company Caldwell, D.R. (1995). Microbial Physiology and Metabolism, W.C. Brown Publications, Iowa, USA.
- Lehninger, A.L., Nelson, D.L. and Cox, M.M. (1993). Principles of Biochemistry, 2 nd Edition, CBS Publishers and Distributors, New Delhi.
- Sashidhara Rao, B. and Deshpande, V. (2007). Experimental Biochemistry: A student Companion. I.K. International Pvt. Ltd.
- Tymoczko JL, Berg JM and Stryer L (2012) Biochemistry: A short course, 2nd ed., W.H.Freeman
- Voet,D. and Voet J.G (2004) Biochemistry 3rd edition, John Wiley and Sons White, D. (1995). The Physiology and Biochemistry of Prokaryotes, Oxford University Press, New York.
- David T. Plummer. An Introduction to Practical Biochemistry

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SRI VENKATESWARA UNIVERSITY
B.Sc. DEGREE EXAMINATION IN MICROBIOLOGY
FIRST YEAR - SECOND SEMESTER
(Revised Syllabus under CBCS w.e.f. 2020-21)

MBT – II: MICROBIAL PHYSIOLOGY AND BIOCHEMISTRY

MODEL QUESTION PAPER

Time: 3 hours Marks: 75 marks

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer any five of the following questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks

PART – A

Answer any *Five* of the following question. (5X5=25M)

1.	
2.	
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PART – B

Answer All The Questions. Each question carries 10 marks (5X10= 50M)

9.	(A) OR (B)
10.	(A) OR (B)
11.	(A) OR (B)
12.	(A) OR (B)
13.	(A) OR (B)

SRI VENKATESWARA UNIVERSITY

CBCS PATTERN FOR MICROBIOLOGY

B.Sc MICROBIOLOGY (CBCS) REVISED SYLLABUS – 2020

MBT – III: MEDICAL MICROBIOLOGY AND IMMUNOLOGY

TOTAL HOURS: 48 **CREDITS: 4**

UNIT- I: **No. of hours: 8**

Normal flora of human body. Host pathogen interactions: infection, invasion, pathogen, pathogen city, virulence and opportunistic infection. General account on no monomial infection. General principles of diagnostic microbiology- collection, transport and processing of clinical samples. General methods of laboratory diagnosis - cultural, biochemical, serological and molecular methods.

UNIT- II: **No. of hours: 8**

General account on microbial diseases - causal organism, pathogenesis, epidemiology, diagnosis, prevention and control**.** Bacterial diseases - Tuberculosis and Typhoid Fungal diseases – Candidacies, As per gallowses, Yeast Protozoa diseases – Malaria, Filarial & Diseases spread by House Fly. Viral Diseases - Hepatitis- A & C and AIDS. Dengue, Chicken Gunya, SARS

UNIT- III: **No. of hours: 10**

Description and pathology of diseases caused by As perilous, Penicillium. Description and pathology of diseases caused by hem flagellates; *Leis mania Donavan, L.tropica, Trypanosome ambience.* Principles of chemotherapy, Antibacterial drugs – Penicillin, Antifungal drugs – Nystatin, Antiviral agents – Robovirin, Drug resistance in bacteria.

Interferon – Nomenclature, types & classification, Induction of interferon, types of Inducers.

UNIT- IV: **No. of hours: 10**

Types of immunity - innate and acquired; active and passive; humeral and cell-mediated immunity.

Primary and secondary organs of immune system - Thymus, Bursa fabrics, bone marrow, spleen and lymph nodes. **Cells of immune system-**Identification and function of B and T lymphocytes, null cells, monocots, macrophages, neutrophils, basophiles and eosinophils.

UNIT – V: **No. of hours: 12**

Antigens - types, chemical nature, antigenic determinants, happens. Factors affecting anti gentility.

Antibodies - basic structure, types, properties and functions of immunoglobulin's.

Types of antigen-antibody reactions - Agglutinations, Precipitation, Neutralization, complement fixation, blood groups. Concept of Hypersensitivity and Autoimmunity

Labeled antibody based techniques - ELISA, RIA and Immune fluorescence.

Polyclonal and monoclonal antibodies - production and applications polyclonal antibodies, Hybridism technology.

MBP – III: MEDICAL MICROBIOLOGY AND IMMUNOLOGY

TOTAL HOURS:30 **CREDITS: 2**

1. Identification of human blood groups.
2. Separate serum from the blood sample (demonstration).
3. Estimation of blood hemoglobin.
4. Total Leukocyte Count of the given blood sample.
5. Differential Leukocyte Count of the given blood sample.
6. Immune diffusion by Ouster loony method.
7. Identify bacteria - *E. coli, Pseudomonas, Staphylococcus*, *Bacillus*, using laboratory strains on the basis of cultural, morphological and biochemical characteristics: Iambic, unease production and catalyse tests
8. Isolation of bacterial flora of skin by swab method.
9. Antibacterial sensitivity by Kirby-Bauer method
10. Study symptoms of the diseases with the help of photographs: Anthrax, Polio, Herpes, chicken pox, HPV warts, Dermatomycoses (ring worms)
11. Study of various stages of malarial parasite in RBCs using permanent mounts.

SUGGESTED READING:

- Ananthanarayan R. and Pannier C.K.J. (2009) Textbook of Microbiology. 8th edition, University Press Publication.

- Brooks G.F., Carroll K.C., Betel J.S., Morse S.A. and Meitner, T.A. (2013) Jawed, Mel nick and Adel berg's Medical Microbiology. 26th edition. McGraw Hill Publication.

- Delves P, Martin S, Burton D, Riot's IM. (2006). Riot's Essential Immunology.11th edition Wiley-Blackwell Scientific Publication, Oxford.

- Gold by RA, Kindt TJ, Osborne BA. (2007). Cubby's Immunology. 6th edition W.H. Freeman and Company, New York.

- Cubby's Immunology. 6th edition W.H. Freeman and Company, New York.

- Jawed, Mel nick and Adel berg's Medical Microbiology. 26th edition. McGraw Hill Microbiology. 4th edition. Elsevier Publication.

- Willey JM, Sherwood LM, and Wool overtone CJ. (2013) Prescott, Harley and Klein's Microbiology. 9th edition. McGraw Hill Higher Education.

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SRI VENKATESWARA UNIVERSITY

B.Sc. DEGREE COURSE IN MICROBIOLOGY

III SEMESTER - W.E.F. 2021-22

MODEL QUESTION PAPER

Time: 3 hours Marks: 75 marks

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer any five of the following questions in Part A.
Part B consists of 5 Units. Answer one full question (A or B) from each unit (i.e., Q.No 9 from Unit – I, Q.No 10 from Unit – II, Q.No 11 from Unit – III, Q.No 12 from Unit – IV, Q.No 13 from Unit – V). Each question carries 10 marks.

PART – A

Answer any *Five* of the following question. (5X5=25M)

1.	
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(P.T.O)

PART – B

Answer All The Questions. Each question carries 10 marks (5X10= 50M)

9.	(A) OR (B)
10.	(A) OR (B)
11.	(A) OR (B)
12.	(A) OR (B)
13.	(A) OR (B)

SRI VENKATESWARA UNIVERSITY

B.Sc COURSE IN MICROBIOLOGY

IV SEMESTER

(CBCS) REVISED SYLLABUS – 2021-22

MBT – IV INDUSTRIAL MICROBIOLOGY

UNIT – I **No. of hours: 7**

Brief history and developments in industrial microbiology, Sources of industrially important microbes and methods for their isolation, preservation and maintenance of industrial strains, strain improvement. Extremophiles as Industrially important microorganism.

UNIT – II **No.of hours: 10**

Concept and discovery of fermentation

Design and Components of a typical Fermenter

Types of fermenters-Laboratory, pilot- scale and production fermenters, constantly stirred tank and air-lift fermenters

Kinetics and methodology of batch, fed-batch (e.g. baker's yeast) and continuous fermentations

Types of fermentation processes- Solid-state and liquid-state (stationary and submerged) fermentations.

Measurement and control of fermentation parameters - pH, temperature, dissolved oxygen, foaming and aeration

UNIT – III **No.of hours: 8**

Industrial microorganisms growth kinetics, factors affecting growth and basic nutrition

Fermentation media-Crude and synthetic media; molasses, corn- steep liquor, sulphite waste liquor, whey, yeast extract and protein hydrolysates,

Down-stream processing- Cell disruption, filtration, centrifugation, solvent extraction, precipitation, lyophilization and spray drying

UNIT – IV **No.of hours: 7**

Microbial production of industrial products - Citric acid, ethanol, penicillin, glutamic acid, Vitamin B12. Enzymes (amylase, protease, lipase) wine, beer ,

Microbial cells as food.-Single Cell Proteins(SCP),-mushroom cultivation

UNIT – V **No.of hours:7**

Methods of immobilization, advantages and applications of immobilization, large scale applications of immobilized enzymes (glucose isomerase and penicillin acylase). Role of Microbes in Medicine. bioleaching and textile industry.

SRI VENKATESWARA UNIVERSITY

B.Sc. DEGREE COURSE IN MICROBIOLOGY

IV SEMESTER - W.E.F. 2021-22

MBT – IV INDUSTRIAL MICROBIOLOGY

MODEL QUESTION PAPER

Time: 3 hours **Marks: 75**

marks

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer any five of the following questions in Part A.
Part B consists of 5 Units. Answer one full question (A or B) from each unit (i.e., Q.No 9 from Unit – I, Q.No 10 from Unit – II, Q.No 11 from Unit – III, Q.No 12 from Unit – IV, Q.No 13 from Unit – V). Each question carries 10 marks.

PART – A

Answer any *Five* of the following question. **(5X5=25M)**

1.	
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(P.T.O)

PART – B

Answer All The Questions. Each question carries 10 marks (5X10= 50M)

9.	**(A)** **OR** **(B)**
10.	**(A)** **OR** **(B)**
11.	**(A)** **OR** **(B)**
12.	**(A)** **OR** **(B)**
13.	**(A)** **OR** **(B)**

MBP – IV INDUSTRIAL MICROBIOLOGY

Total hours: 36 **Credits: 2**

1. Demonstration of Sugar (glucose and Sucrose) fermentation by using Baker'sYeast
2. Quantitative estimation of ethanol by potassium dichromate method
3. Fermentative production Amylase by *Aspergillus sp,*
4. Fermentative production of protease by *Bacillus sp.*
5. Demonstration of wine production by using grape juice
6. Microbial fermentation for the Citric acid production and estimation of citric acid
7. Bioassay of Vitamin B12(Cyanocobalamine)
8. A visit to any educational institute/industry to see an industrial fermenter/bioreactor, and other downstream processing operations

Reference Books

1. Richard H. Baltz. Julian E Davies and Arnold L.Demain Manual of Industrial Microbiology and Biotechnology. 3rd edition, ASM Press (2010).

2. Daniel Forciniti. Industrial Bioseperation: Principles and practice. 1st edition, WileyBlackwell (2008).

3. Reed. G. Prescott and Dunn's Industrial Microbiology. CBS Publishers. (1999).

4. Demain, A. L. Industrial Microbiology and Biotechnology. 2nd Edition. (2001).

5. EL Mansi. E.M.T. FermentationMicrobiologyand Biotechnology. 4ndEdition,CRC Taylor&Francis (2020).

6. Waites,M.J.,Morgan, N.L.,Rockey, J.S.andHigton,G.Industrial Mic robiology: An lntroduction. Blackwell SciencePublishers(2002).

7. Casida LE, Industrial Microbiology, J. Wiley, (Reprint2008).

8. Pelczar, MJ Chan ECS and Krieg NR, Microbiology McGraw-Hill(2021)

Willey,Sherwood,Woolverton. Prescott,Harley, and Klein's Microbiology McGraw-Hill publication,7th edition2008

10. Tortora,Funke,10th edition(2010). Microbiology.Pearson Benjamin Cummings.

11. JACQUELYN G. BLACK. Microbiology Principles and explorations. JOHN WILEY & SONS(2018)

12. Madigan,Martinko, Bender,Buckley,Stahl.Brock Biology of Microorganisms. Pearson 14th edition,2015

13. Tom Besty,D.C Jim Koegh.Microbiology Demystified McGRAW-HILL,2005.

14. Wulf Crueger.Cruegers Biotechnology: A Textbook of Industrial Microbiology 2017
15.Dr.R.C.Dubey,Dr.D.K.Maheswari 2012 .Practical Microbiology
16.S.Ram reddy and G.Ram reddy 2012.Practical Microbiology,

SRI VENKATESWARA UNIVERSITY

B.Sc COURSE IN MICROBIOLOGY

IV SEMESTER

(CBCS) REVISED SYLLABUS – 2021-22

MBT – V: MOLECULAR BIOLOGY AND MICROBIAL GENETICS

TOTAL HOURS: 48 **CREDITS: 4**

UNIT- I **No. of hours: 8**

DNA and RNA as genetic material. Replication of DNA: Bidirectional and unidirectionalreplication,semi-conservative,semidiscontinuousreplicationMechanismof DNA replication: Enzymes and proteins involved in DNA replication –DNA polymerases, DNA ligase, primase, telomerase – for replication of linear ends,mechanism of DNA replication and inhibitors of DNA replication.

UNIT- II **No. of hours: 12**

Transcription - Definition, promoter - concept and strength of promoter. Transcriptional Machinery and Mechanism of transcription. Translation - Genetic code, Translational machinery and translation mechanism, inhibitors of transcription and Translation,

Regulation of gene expression in bacteria - operon concepts - Negative and positive control of the Lac Operon, trp operon.

UNIT- III **No. of hours: 12**

Concept of gene : Muton, Recon and Cistron. One gene one enzyme and one gene one polypeptide hypotheses

Mutagens - Physical and Chemical mutagens

Mutations - spontaneous and induced, base pair changes, frame shifts, deletions, inversions, tandem duplications, insertions.

Outlines of DNA damage and repair mechanisms

UNIT- IV **No. of hours: 10**

Mechanisms of Genetic Exchange:

Transformation - Discovery, molecular mechanism of natural competence

Conjugation - Discovery,molecular mechanism, Hfr and F' strains

Transduction – Discovery ,Generalized transduction, specialized transduction

UNIT- V **No. of hours: 6**

Extra chromosomal genetic elements: Properties, types and function of plasmids,

. Prokaryotic transposable elements – Insertion Sequences, composite and non-composite transposons, Replicative and Non replicative transposition, Uses of transposons and transposition.

Reference Books:

1. Benjamin Lewin, GeneXII, OxfordUniversityPress, (12 edition)2018).

2. BruceAlberts,AlexanderJohnson,JulianLewis,MartinRaff,KeithRoberts,PeterWalter, Molecular biology of the Cell, 6th Edition. Garland publishing Inc, (2014).

3. Darnell,LodishandBaltimore, MolecularCellBiology, ScientificAmericanPublishingInc. (2016)

4.Watson.J.D,Baker.T.A,Bell.S.P,Gann.A.Levine.M.Losick.R, Molecular Biology of Gene, 5th Edition.TheBenjamin/CummingsPub.Co.Inc. (2007).

5. DavidFrifielder,Stanely R.Maloy, Molecularbiology and Microbial genetics. 2ndEdition,JonesandBarlettPublishers. (1994).

6. BrownT.A., GeneCloningand DNA analysis. 4nd Edition, ASMpress. (2011).

7. Sandy Primrose. Principles of Gene Manipulation and Genomics. 7th Ed., Blackwell Publishers. (2013).

8. Glick BR and Pasternak JJ, Molecular Biotechnology, 3nd Ed.ASM press. (2010).

9. Uldis N.Streips,RonaldE.Yasbin.Modern Microbial Genetics.2nd EditionWiley-Liss,Inc. (2002).

10. Russel P J, Essential genetics, Blackwell Science Inc, 2 sub edition, (1987).

11. Gardner E J, Simmons M J and Snupstad DP, Principles of genetics, 8th edition John Wiley & Sons, (2006).

12. Larry Snyder , Wendy Champness Molecular Genetics of Bacteria, ASM Press; (2007)

MBP – V: MOLECULAR BIOLOGY AND MICROBIAL GENETICS

TOTAL HOURS: 48 **CREDITS: 2**

1. Study of different types of DNA and RNA using micrographs and model / schematic representations.
2. Study of semi-conservative replication of DNA through micrographs / schematic representations
3. Isolation of genomic DNA from *E. coli*
4. Estimation of DNA using UV spectrophotometer.
5. Resolution and visualization of DNA by Agarose Gel Electrophoresis.
6. Resolution and visualization of proteins by Polyacrylamide Gel Electrophoresis (SDS - PAGE).
7. Problems related to DNA and RNA characteristics, Transcription and Translation.
8. Induction of mutations in bacteria by UV light.
9. Instrumentation in molecular biology - Ultra centrifuge, Transilluminator, PCR

SUGGESTED READING:

- Freifelder, D. (1990). Microbial Genetics. Narosa Publishing House, New Delhi. Freifelder, D. (1997). Essentials of Molecular Biology. Narosa Publishing House, New Delhi.
- Glick, B.P. and Pasternack, J. (1998). Molecular Biotechnology, ASM Press, Washington D.C., USA.
- Lewin, B. (2000). Genes VIII. Oxford University Press, England.
- Maloy, S.R., Cronan, J.E. and Freifelder, D. (1994). Microbial Genetics, Jones and Bartlett Publishers, London.
- Ram Reddy, S., Venkateshwarlu, K. and Krishna Reddy, V. (2007) A text Book of Molecular Biotechnology. Himalaya Publishers, Hyderabad.
- Sinnot E.W., L.C. Dunn and T. Dobzhansky. (1958). Principles of Genetics. 5 th Edition. McGraw Hill, New York.
- Smith, J.E. (1996). Biotechnology, Cambridge University Press.
- Snyder, L. and Champness, W. (1997). Molecular Genetics of Bacteria. ASM press,
- Strickberger, M.W. (1967). Genetics. Oxford & IBH, New Delhi.
- Verma, P.S. and Agarwal, V.K. (2004). Cell Biology, Genetics, Molecular Biology, Evolution and Ecology. S. Chand & Co. Ltd., New Delhi.

SRI VENKATESWARA UNIVERSITY

B.Sc. DEGREE COURSE IN MICROBIOLOGY

IV SEMESTER - W.E.F. 2021-22

MBT – V: MOLECULAR BIOLOGY AND MICROBIAL GENETICS

MODEL QUESTION PAPER

Time: 3 hours **Marks: 75**

marks

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer any five of the following questions in Part A.
Part B consists of 5 Units. Answer one full question (A or B) from each unit (i.e., Q.No 9 from Unit – I, Q.No 10 from Unit – II, Q.No 11 from Unit – III, Q.No 12 from Unit – IV, Q.No 13 from Unit – V). Each question carries 10 marks.

PART – A

Answer any *Five* of the following question. (5X5=25M)

1.	
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(P.T.O)

PART – B

Answer All The Questions. Each question carries 10 marks (5X10= 50M)

9.	**(A)** **OR** **(B)**
10.	**(A)** **OR** **(B)**
11.	**(A)** **OR** **(B)**
12.	**(A)** **OR** **(B)**
13.	**(A)** **OR** **(B)**