BOARD OF STUDIES - 2019-2020

DEPARMENT OF MICROBIOLOGY

D.K.GOVT.COLLEGE FOR WOMEN (A), NELLORE.

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D. K. GOVT. COLLEGE FOR WOMEN (A), NELLORE

Department of Microbiology

The board of studies of Microbiology, meeting for the 2019-2020 is conducted at the Dept of Microbiology, D. K. GOVT. COLLEGE FOR WOMEN (A), NELLORE on 30.03.2019.

S.No	Name & Designation and address	Position
1.	Dr. E.K.Dorcas Joy,Lecturer in Botany, In charge, Dept of Microbiology D.K Govt college For Women(A), Nellore. Ph: 8074564146	Chair person 30/3/19
2.	Dr.Ch. Vijaya Dept. of Marine biology Vikrama Simhapuri University,Nellore Ph: 9441373188	University Nominee 30/3/19
3.	P. Aruna, Lecturer in Microbiology, YA Govt college For Women. Chirala-523155. Ph:9298558440	AC Nominee
4.	K. Sucharitha, Lecturer in Microbiology, Gcw (A),Sambasivapeta, Guntur- 522001 Ph:9963180561	AC Nominee 30/03/19
5.	K. Rk. Prasad Rao, Managing Director Prasad Organic pvt ltd. Old Mahabalipuram Road Chennai. Ph: 9840050123	Industry Representative
6.	Ms. M. Medini M.Sc. Nellore.	Student Alumnus

AGENDA

1. Revamping of Syllabus for all years/Semesters B.Sc.MBC. I,II,&III years
2. Blue print &Model Question papers.
3. Fixing Internal& External marks for I & II years 30&70 and for III year 40&60.
4. Improvisation of Teaching& Learning Methodology by focusing on ICT methods.
5. Choice based credit system for second year students.
6. Inclusion of Research Activities & Organizing Seminars.
7. Providing new methods of assessment of students in view of CBCS.
8. Panel of Question paper Setters & Examiners.

30/03/19

30/03/19

30/3/19

Minutes for Board of studies in Microbiology,

30.03.2019

Meeting regarding Board of Studies has been stated at 11am on 30.03.2019 in the Department of MICROBIOLOGY. It is chaired by Dr. E.K. Dorcas Joy, In-charge, Dept. of BOTANY. The members attended the meeting were thoroughly discussed about Agenda and Unanimously resolved the following points.

In I semester there were no inclusion or deletion

In paper II, unit-II the topics ,UV-Vis spectrophotometry, Centrifugation are shifted to III BSc MBC,VI semester that is in Elective – Instrumentation and Biotechniques in unit-IV.

In IV semester paper-IV,unit-V two new topics added 1.Ebola Virus 2.H1N1 virus are introduced.

In V semester paper – VI practical syllabus 2,4,5,6 topics are replaced with Crowded plate technique, MBRT, Alcohol production, Estimation of Citric acid.

In VI semester Cluster Elective-II-paper VIII (II) A, the third unit is replaced with microorganisms used as biocontrol agents, against plant pathogens, insecticides and weeds along with vermicomposting.

Semester examination assessment component is designed as follows:

I &II year External examination -- 70

Internal examination -- 30

Internal assessment

Written examination –20 M

Project/Seminar --5M

Assignment --5M

III year External examination --60

Internal examination --40

Internal Assessment

Written examination –20 M

Project/Seminar --10M

Assignment /Viva- voce/case study --10M

JUSTIFICATION:

Change is made because of the relevance of the topics

To have knowledge about to inculcate knowledge about the emerging diseases.

The topics are relevant to the VI paper.

In paper VIII-IIA, From the unit III Agricomposting is deleted and instead it is updated with above topics as the vermicomposting unit is established in the campus.

b

MICROBIOLOGY- BLUE PRINT

1. DISTRIBUTION OF MARKS AS PER LEARNING OBJECTIVES

SEMESTER- I, II, III & IV

MAXIMUM MARKS-70

S. NO	LEARNING OBJECTIVES	%	MARKS
1	Knowledge/Recall	28	20
2	Understanding	22	15
3	Applications	22	15
4	Analysis	14	10
5	Evaluation	14	10
	Total	100	70

2. DISTRIBUTION OF MARKS AS PER QUESTION TYPES

S. NO	QUESTION TYPE	%	MARKS
1	Essay	58	40
2	Short answers	28	20
3	Very Short answers	14	10
	Total	100	70

3. DISTRIBUTION OF MARKS AS PER DIFFICULTY LEVELS

Easy	Average	Difficult	Total
30	20	20	70

30/3/19

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MICROBIOLOGY- BLUE PRINT

1. DISTRIBUTION OF MARKS AS PER LEARNING OBJECTIVES

SEMESTER- V & VI

MAXIMUM MARKS-60

S. NO	LEARNING OBJECTIVES	%	MARKS
1	Knowledge/Recall	34	20
2	Understanding	16.5	10
3	Applications	16.5	10
4	Analysis	16.5	10
5	Evaluation	16.5	10
	Total	100	60

2. DISTRIBUTION OF MARKS AS PER QUESTION TYPES

S. NO	QUESTION TYPE	%	MARKS
1	Essay	67	40
2	Short answers	33	20
	Total	100	60

3. DISTRIBUTION OF MARKS AS PER DIFFICULTY LEVELS

Easy	Average	Difficult	Total
30	15	15	60

30/3/19

30/3/19

30/3/19.

I AND II YEAR QUESTION PAPER PATTERN FOR INTERNAL ASSESSMENT: 20 MARKS (FOR EACH INTERNAL)
DISTRIBUTION OF INTERNAL ASSESSMENT OF 20 MARKS

S. No	Type of Questions	No. of Questions given	No. of Questions to be answered	Marks allotted to each Questions	Total Marks
1	Part I Short essay Questions	4	3	4	12
2	Part II Essay Questions	2	1	8	8
	Total				20

DISTRIBUTION OF INTERNAL ASSESSMENT OF 40 MARKS

1. Written Examination for : 20 Marks
2. Quiz/ Project and Viva-voce: 10 marks
3. Total Internal Marks=30 Marks.

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III YEAR QUESTION PAPER PATTERN FOR INTERNAL ASSESSMENT: 20 MARKS (FOR EACH INTERNAL) DISTRIBUTION OF INTERNAL ASSESSMENT OF 20 MARKS

S. No	Type of Questions	No. of Questions given	No. of Questions to be answered	Marks allotted to each Questions	Total Marks
1	Part I Short essay Questions	4	3	4	12
2	Part II Essay Questions	2	1	8	8
	Total				20

Quiz / Project and Viva-voce/Digital assignment and Viva-voce/ Case study: 20 marks

DISTRIBUTION OF INTERNAL ASSESSMENT OF 40 MARKS

1. **Written Examination for : 20 Marks**
2. **Quiz / Project and Viva-voce/Digital assignment and Viva-voce/ Case study: 20 marks**
3. **Total Internal Marks=40 Marks.**

30/3/19

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AP STATE COUNCIL OF HIGHER EDUCATION
CBCS PATTERN FOR MICROBIOLOGY

EAR	SEMESTER	PAPER	TITLE	MARKS	CREDITS
I	I	I	Introductory Microbiology and Microbial Diversity	100	03
			Practical - I	50	02
	II	II	Microbial Biochemistry and Metabolism	100	03
			Practical - II	50	02
II	III	III	Microbial Genetics and Molecularbiology	100	03
			Practical - III	50	02
	IV	IV	Immunology and Medical Microbiology	100	03
			Practical - IV	50	02
III	V	V	Environmental and Agricultural Microbiology	100	03
			Practical - V	50	02
		VI	Food And Industrial Microbiology	100	03
			Practical - VI	50	02
	* Any one Paper from A, B and C	VII A*	Microbial Biotechnology	100	03
			Practical - VII A	50	02
		VII B*	Advances in Microbiology	100	03
			Practical - VII B	50	02
	** Any one cluster from I, II and III	VII C*	Instrumentation and Biotechniques	100	03
			Practical - VII C	50	02
	VI	VIII (I)**	**Cluster Elective - I**		
			I. Diagnostic MIcrobiology	100	03
			II. Microbial quality control in food and pharmaceutical industry	100	03
			III. Bioinformatics	100	03
			Practical – VIII: 1	50	02
			Practical – VIII: 2	50	02
			Practical/Project Work	50	02
		VIII (II)**	**Cluster Elective - II**		
			I. Microbes in sustainable agriculture	100	03
			II. Biofertilizers and Biopesticides	100	03
			III. Mushroom Cultivation	100	03
			Practical – VIII: 1	50	02
			Practical – VIII: 2	50	02
			Practical/Project Work	50	02

AUTONOMOUS SYLLABUS (2018-19)

30.3.2019

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D.K. GOVT COLLEGE (AUTONOMOUS) FOR WOMEN, NELLORE

B.Sc Microbiology (CBCS) Syllabus

First Year- SEMESTER-I

INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY

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

History and mile stones in Microbiology

Contributions of Antony Von Leewenhock, Edward Jenner, Louis Pasteur, Robert Koch, Ivanowsky, Beijerinck, Winogradsky

Importance and applications of microbiology

Classification of Microorganisms_ , Haeckel's three kingdom concept, Whittaker's five kingdom concept, three domain concept of Carl woese

Outline classification of bacteria as per the second edition of Bergey's manual of systematic Bacteriology(up to classes only)

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

General characteristics of Bacteria, Archea, mycoplasmas and Cyanobacteria , Algae, Fungi, and Protozoa.

Ultra structure of Prokaryotic cell- Variant components and invariant components.

Composition and detailed structure of gram positive and gram negative cell wall, Endospore

General Characteristics of viruses

Morphology, Structure and replication of TMV and HIV. Replications of Bacteriophage (T4)

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

Principles of Microscopy- Bright field, phase contrast and Electron microscopy

General Characteristics of viruses

Morphology, Structure and replication of TMV and HIV.

Replications of Bacteriophage (T4)

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

Isolation of Microorganisms from natural habitats

Pure culture techniques- dilution-plating, streak –plate, Spread-plate, Pour-plate and Enrichment culturing

Preservation of microbial cultures- subculturing, overlaying cultures with mineral oils, lyophilisation, sand cultures, storage at low temperature.

Cultivation of viruses- Tissue culture and embryonated egg.

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

Staining Techniques-simple and differential (Gram staining and Spore staining) Hanging drop method

Sterilization and disinfection techniques- Physical methods- autoclave, hot-air oven, Radiation methods-UV rays, Gamma rays

Chemical methods- alcohols, phenols, Aldehydes, fumigants; Filtration methods HEPA Filters- Laminar Airflow Micropore filtration

MBP- 101 INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY

CREDITS: 2

TOTAL HOURS: 48

1. Microbiology Good Laboratory Practices and Biosafety.
2. Preparation of culture media for cultivation of bacteria
3. Preparation of culture media for cultivation of fungi
4. Sterilization of medium using Autoclave
5. Sterilization of glassware using Hot Air Oven
6. Light compound microscope and its handling
7. Microscopic observation of bacteria (Gram +ve bacilli and cocci, Gram -ve bacilli), Cyanobacteria, Algae and Fungi.
8. Simple staining
9. Gram's staining 10. Hanging-drop method.
11. Isolation of pure cultures of bacteria by streaking method.
12. Preservation of bacterial cultures by various techniques.
13. Diagramatic or Electron photomicrographic observation of TMV, HIV, T4 phage and Adenovirus

SUGGESTED READING

Alexopoulos, C.J., Mims, C.W. and Blackwell, M. (1996).

Introductory Mycology, Wiley, New York. Atlas, R.A. and Bartha, R. (2000). Microbial Ecology - Fundamentals and Application, Benjamin Cummings, New York. Dimmock, N.J., Easton, A.J. and Leppard, K.N. (2001).

Introduction to Modern Virology, Blackwell Science Ltd, U.K. Dube, R.C. and Maheswari, D.K. (2000) General Microbiology.

S Chand, New Delhi. Edition), Himalaya Publishing House, Mumbai. Frobisher, H., Hinsdil, R.D., Crabtree, K.T. and Goodhert, D.R. (2005).

Fundamentals of Microbiology, Saunder and Company, London. Jaya Babu (2006).

Practical Manual on Microbial Metabolisms and General Microbiology.

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B.Sc Microbiology (CBCS) Syllabus

First Year- SEMESTER-II

MBT- 201 : MICROBIAL BIOCHEMISTRY & METABOLISM

TOTAL HOURS: 48 **CREDITS: 4**

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

Outline classification and general characteristics of carbohydrates (monosaccharides, disaccharides and polysaccharides).

General characteristics of amino acids and proteins. Structure of nitrogenous bases, nucleotides, nucleic acids.

Fatty acids (saturated and unsaturated) lipids (spingolipds, sterols and phospholipids).

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

Principle and applications of - Colorimerty

Chromatography (paper, thin-layer and column),

Spectrophotometer (UV & visible), Centrifugation and Gel Electrophoresis.

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

Properties of enzymes – Simple, Conjugated; Coenzymes, Cofactors.

IUB system of enzyme cofactors.

Mechanism of enzyme action.

Factors affecting catalytic activity. Inhibition of enzyme activity – competitive, noncompetitive, uncompetitive and alosteric.

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

Microbial Nutrition –Nutritional requirements and uptake of nutrients by cells.

Nutritional groups of microcroorganisms- autotrophs, heterotrophs, mixotrophs.

Growth media- synthetic, complex, selective, enrichment and differential media.

Microbial Growth- different phases of growth in batch cultures, Synchronous, continuous, biphasic growth.

Factors influencing microbial growth. Methods for measuring microbial growth – Direct microscopy, viable count estimates, turbiodometry and biomass.

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

Aerobic respiration -Glycolysis, HMP path way, ED path way, TCA cycle, Electron transport, oxidative and substrate level phosphorylation.

Anaerobic respiration, Fermentation - Alcohol and lactic acid fermentations. Outlines of oxygenic and anoxygenic photosynthesis in bacteria.

MBP- 201: MICROBIAL BIOCHEMISTRY & METABOLISM

TOTAL HOURS: 48 **CREDITS: 2**

1. Qualitative Analysis of Carbohydrates
2. Qualitative Analysis of Aminoacids
3. Colorimetric estimation DNA by diphenylamine method
4. Colorimetric estimation of proteins by Biuret/Lowry method
5. Paper chromatographic separation of sugars and amino acids
6. Preparation of different media- Synthetic and Complex Media
7. Setting and observation of Winogradsky column.
8. Estimation of CFU count by spread plate method/pour plate method.
9. Bacterial growth curve. 10. Factors affecting bacterial growth – pH.
11. Factors affecting bacterial growth – Temperature.
12. Factors affecting bacterial growth –Salts

1. Text Book of Microbiology (Microbial Physiology and Genetics Telugu Academy).

2. Microbial physiology and Genetics – R.P .Singh.

3. General Microbiology - Pelczar. SUGGESTED READING Berg JM, Tymoczko JL and Stryer L (2011) Biochemistry, W.H.Freeman and Company Caldwell, D.R. (1995).

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B.Sc MICROBIOLOGY (CBCS) SYLLABUS

SECOND YEAR – SEMESTER- III

MBT- 301 MICROBIAL GENETICS AND MOLECULAR BIOLOGY

TOTAL HOURS:48 **CREDITS: 4**

UNIT-I — No. of hours: 10

Nucleic acids – DNA and RNA Structure and organization of prokaryotic DNA

Extrachromosomal genetic elements – Plasmids and transposons.

Replication of DNA – Semi conservative mechanism, Enzymes involved in replication.

UNIT-II — No. of hours: 10

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

Mutagens - Physical and Chemical mutagens.

Outlines of DNA damage and repair mechanisms.

Genetic recombination in bacteria – Conjugation, Transformation and Transduction.

UNIT-III — No. of hours: 10

Concept of gene – Concept of gene – Traditional and Modern - Muton, Recon and Cistron.

One gene one enzyme and one gene one polypeptide hypotheses.

Types of RNA and their functions.

Genetic code.

Structure of ribosomes.

UNIT-IV — No. of hours: 8

Types of genes – structural, constitutive, regulatory Protein synthesis – Transcription and translation. Regulation of gene expression in bacteria – lac operon.

UNIT-V — No. of hours: 10

Basic principles of genetic engineering.

Restriction endonucleases, DNA polymerases and ligases. Vectors – PBR 322, PUC 101.

Polymerase chain reaction.

Genomic and cDNA libraries.

Outlines of gene cloning methods.

General account on application of genetic engineering in industry, agriculture and medicine.

MBP- 301 MICROBIAL GENETICS AND MOLECULAR BIOLOGY

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 (Demonstration)

4. Estimation of DNA using UV spectrophotometer. (Demonstration)

5. Resolution and visualization of DNA by Agarose Gel Electrophoresis.

6. Resolution and visualization of proteins by Polyacrylamide Gel Electrophoresis (SDS-PAGE). (Demo) 7. Problems related to DNA Mutations.

8. Induction of mutations in bacteria by UV light.

9. Instrumentation in molecular biology – Ultra centrifuge, Transilluminator, PCR (through Photographs)

SUGGESTED READING

Crueger, W. and Crueger, A. (2000). Biotechnology: A Text Book of Industrial Microbiology, PrenticeHall of India Pvt. Ltd., New Delhi.

Freifelder, D. (1990). Microbial Genetics. Narosa Publishing House, New Delhi.

Freifelder, D. (1997).

Essentials of Molecular Biology. Narosa Publishing House, New Delhi. Glazer, A.N. and Nikaido, H. (1995).

Microbial Biotechnology – Fundamentals of Applied Microbiology, W.H. Freeman and company, New York. Glick, B.P. and Pasternack, J. (1998).

Molecular Biotechnology, ASM Press, Washington D.C., USA. Kannan, N. (2003).

Hand Book of Laboratory Culture Medias, Reagents, Stains and Buffers.

Panima Publishing Co., New Delhi. 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. Nicholl, D.S.T. (2004). An Introduction to Genetic Engineering. 2 nd Edition.

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B.Sc MICROBIOLOGY (CBCS) SYLLABUS

SECOND YEAR – SEMESTER- IV

MBT- 401 IMMUNOLOGY AND MEDICAL MICROBIOLOGY

TOTAL HOURS: 48 **CREDITS: 4**

UNIT-I

No. of hours: 10

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

Primary and secondary organs of immune system – thymus, bursa fabricus, bone marrow, spleen and lymph nodes.

Cells of immune system. - B and T lymphocytes, null cells, monocytes, macrophages, neutrophils, basophils and eosinophils.

UNIT-II

No. of hours: 10

Antigens – types, chemical nature, antigenic determinants, haptens.

Factors affecting antigenicity.

immunoglobulin – basic structure, types, properties and functions of immunoglobulins.

Concept of hypersensitivity and Autoimmunity.

Types of antigen-antibody reactions - Agglutinations, Precipitation, Neutralization, complement fixation, blood groups.

Labeled antibody based techniques – ELISA, RIA and Immunofluroscence.

Polyclonal and monoclonal antibodies production and applications

UNIT-III

No. of hours: 10

Normal flora of human body.

Host pathogen interactions: infection, invasion, pathogen, pathogenicity, virulence and opportunistic infection.

General account on nosocomial 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-IV **No. of hours: 8**

Antibacterial Agents- Penicillin, Streptomycin and Tetracycline,

Antifungal agents – Amphotericin B, Griseofulvin

Antiviral substances - Amantadine and Acyclovir

Tests for antimicrobial susceptibility.

Brief account on antibiotic resistance in bacteria - Methicillin-resistant

Staphylococcus aureus (MRSA).

Vaccines – Natural and recombinant.

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

General account of microbial diseases – causal organism, pathogenesis, epidemiology, diagnosis, prevention and treatment

Bacterial diseases – Tuberculosis and Typhoid

Fungal diseases – Candidiasis.

Protozoal diseases – Malaria,

Viral diseases - Hepatitis- B and AIDS

MBP- 401 IMMUNOLOGY AND MEDICAL MICROBIOLOGY

TOTAL HOURS: 48 **CREDITS: 2**

1. Identification of human blood groups.
2. Separate serum from the blood sample (demonstration).
3. Estimation of blood haemoglobin in sahli method.
4. Total RBC Count of the given blood sample using haemocytometer.
5. Differential Leukocyte Count of the given blood sample.
6. single radial Immunodiffusion by Ouchterlony method double diffusion method
7. Identify bacteria (E. coli, Pseudomonas, Staphylococcus, Bacillus) using laboratory strains on the basis of cultural, morphological and biochemical characteristics: IMViC, urease production and catalase tests
8. Isolation of bacterial flora of skin by swab method.
9. Antibacterial sensitivity by Kirby-Bauer method.
10. Identifiation of diseases bosed on the suysuptanes.
11. Study symptoms of the diseases with the help of photographs: Anthrax, Polio, Herpes, chicken pox, HPV warts, Dermatomycoses (ring worms)

12. Study of various stages of malarial parasite in RBCs using permanent mounts. 15

SUGGESTED TEST BOOKS.

1. Immunology by Nandinicretly . Nandinishetty.

2. Text book of Microbiology by R Anantanarayana.

SUGGESTED READING

Abbas AK, Lichtman AH, Pillai S. (2007).

Cellular and Molecular Immunology. 6th edition Saunders Publication, Philadelphia.

Ananthanarayan R. and Paniker C.K.J. (2009) Textbook of Microbiology. 8th edition, University Press Publication Brooks G.F., Carroll K.C., Butel J.S., Morse S.A. and Mietzner, T.A. (2013) Jawetz, Melnick and Adelberg's Medical Microbiology. 26th edition.

McGraw Hill Publication Delves P, Martin S, Burton D, Roitt IM. (2006).

Roitt's Essential Immunology.11th edition WileyBlackwell Scientific Publication, Oxford. Goering R., Dockrell H., Zuckerman M. and Wakelin D. (2007) Mims' Medical Microbiology. 4th edition. Elsevier Goldsby RA, Kindt TJ, Osborne BA. (2007). Kuby's Immunology. 6th edition W.H. Freeman and Company, New York. Kuby's Immunology. 6th edition W.H. Freeman and Company, New York. Jawetz, Melnick and Adelberg's Medical Microbiology. 26th edition.

McGraw Hill Microbiology. 4th edition. Elsevier Publication Richard C and Geiffrey S. (2009). Immunology. 6th edition. Wiley Blackwell Publication.

Willey JM, Sherwood LM, and Woolverton CJ. (2013) Prescott, Harley and Klein's Microbiology. 9th edition.

McGraw Hill Higher Education

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D.K. GOVT COLLEGE (AUTONOMOUS) FOR WOMEN, NELLORE

BSc MICROBIOLOGY (CBCS) SYLLABUS

THIRD YEAR- SEMESTER-V

501 ENVIRONMENTAL & AGRICULTURAL MICROBIOLOGY

Total Hours:36 **CREDITS:3**

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

Terrestrial Environmental: Soil profile and soil Microflora

Aquatic Environmental :Microflora of fresh water marine habitats

Atmosphere: Aeromicroflora and dispersal of microbes

Extreme Habitats:Extremophiles:Microbes thriving at high & low temperature,

PH, high hydrostatic & osmotic pressures salinity,& low nutrients levels

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

Role of Microorganism in nutrient cycling(Carbon,nitrogen,phosphorus).

Treatment and safety of drinking (potable) water, methods to detect portability of water samples:(a) Standard qualitative procedure: presumptive test /MPN test, colifirmed and Completed tests for feacal coliforms (b) membrane filter techniques, Microbialinteraction:Mutualism,commensalism,antagonism,competition, parasitism,predation.

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

Outline of Solid waste management: Sources and types of Solid waste disposal

(composting and sanitary landfill)

Liquid waste management: composition and strength of Sewage (BOD and COD), primary ,secondary,(oxidation ponds, trickling filter, activated sludge process and septic tank)and tertiary sewage treatment

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

Plant Growth Promoting Microorganism; Mycorrhizae, Rhizobia,Azotobacter,

Frankia. Phasphate-solubilizer and cyanobacteria.

Outlines of biological nitrogen fixation (symbiotic, non-symbiotic)

Biofertilisers- Rhizobia

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

Concept of disease in plants, symptoms of plant disease caused by fungi , bacteria and viruses, plant disease- groundnut rust, Citrus canker and tamota leaf curl

priciples of plant disease control

501-ENVIRONMENTAL & AGRICULTURAL MICROBIOLOGY

Practical syllabus

1.Analysis of soil pH, Moisture content and water holding capacity.

2. Isolation of microbes(Bacteria and fungi) from soil.

3.Study of air flora by petri plate exposure

4.Analysis of potable water: SCP,presumptive,confirmed and completed test ,determination of coliform count in water MPN.

5.Determination of biological oxygen demand (BOD) of waste water sample.

6.Isolation of Rhizobium from root nodules.

7.staining and observation of Vesicular Arbuscular Mycorrhizal (VAM) fungi.

8.Oservation of plant diseases of local importance Citrus canker, tikka disease of ground nut , Bhendi yellow vein mosaic ,Rust , Smuts, Powdery mildews, Tamota leaf curl.

D.K. GOVT COLLEGE (AUTONOMOUS) FOR WOMEN, NELLORE

BSc MICROBIOLOGY (CBCS) SYLLABUS

THIRD YEAR- SEMESTER-V PAPER-VI

MBT-502 FOOD AND INDUSTRIAL MICROBIOLOGY

TOTAL HOURS: 36

UNIT-I — 8 hours

Intrinsic and extrinsic parameters that effects microbial growth in food

Microbial spoilage of food-fruits, vegetables, milk, meat, egg, bread and canned foods

Food intoxication (Botulism)

Food borne diseases (salmonellosis) and their detection.

UNIT-II — 7 hours

Principles of food preservation-physical and chemical methods.

Fermented and dairy foods-cheese and yogurt.

Microbiology as food-SCP, edible mushrooms (white button, oyster and paddy starw). probiotics and their benefits.

UNIT-III — 6 hours

Microorganisms of industrial importance-yeasts, (saccharomyces cerevisiae)

Moulds, (Aspergillus niger) Bacteria(E.coli), actinomycets(streptomycets griseus).

Outline of isolation and screening and strain improvement of industrially-important microorganisms.

UNIT-IV — 8 hours

Types of fermentation processes-solid state, liquid state, fed-batch, continuous.

Basic concepts of Design of ferment.

Ingredients of fermentation media

Downstream processing-filtration, centrifugation, cell disruption, solvent extraction.

UNIT-V — 7 hours

Microbial production of industrial products: citric acid, Ethanol, Amylase, penicillin,

Glutamic acid, and vitamin B12

MBT-502 FOOD AND INDUSTRIAL MICROBIOLOGY

Practical syllabus

1. Isolation of bacteria and fungi from spoiled bread/fruits/Vegetables.
2. Sterility test for Instruments- Autoclave and Hot air Oven.
3. Disinfection of selected Instruments and equipment's.
4. Sterility of air and its relationship to laboratory and Hospital sepsis.
5. Sterility testing of microbiological media.
6. Sterility testing of pharmaceutical products antibiotics, Vaccines and fluids.
7. Standard qualitative analysis of water.
8. Quantitative analysis of water- membrane filter method.
9. Analysis of food samples for mycotoxins.

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BSc MICROBIOLOGY (CBCS) SYLLABUS

THIRD YEAR- SEMESTER-VI

PAPER -VIIA

MBT.601- A MICROBIAL BIOTECHNOLOGY

TOTAL HOURS :36 **CREDITS:3**

UNIT –I **No. of Hours :8**

Microbial Biotechnology: Scope and its applications in human therapeutics and environment (Bioremediation of Xenobiotics).

Genetically engineered microbes for industrial application: Bacteria and Yeast.

UNIT –II **No. of Hours :7**

Recombinant microbial production processes Pharmaceutical industries –Streptokinase

Recombinant vaccines(Hepatitis B vaccine).

Microbial Polysaccharides, Polyesters and Bioplastics.

Microbial biosensors

UNIT –III **No. of Hours :10**

Microbial based transformation of steroids

Biocatalytic processes their industrial application: Production of high

Fructose corn syrup and Production of cocoa butter substitute.

Immobilization methods and their application.

UNIT –IV **No. of Hours :7**

Bioethanol and Biodiesel production: commercial production from lignocellulosic waste and algal biomass.

Biogas production: Methane production using microbial culture.

Bio leaching.

UNIT –V **No. of Hours :4**

Outlines of Intellectual Property Rights: Patents. Copyrights, Trademarks

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MBT.601- A MICROBIAL BIOTECHNOLOGY

PRACTICAL SYLLABUS

TOTAL HOURS :36 **CREDITS:2**

1.Yeast cell immobilization in calcium alginate gels
2.Pigment production from fungi/bacteria.
3.Isolation of protease/xylanase/lipase production bacteria
4.Study of algal Single Cell Proteins.

SUGGESTEED READING

Crueger W, Crueger A(1990) Biotechnology: **A tect book of Industrial Microbiology** 2nd edition Sinauer associates, Inc

Demain, A. L and Daviies , J.E(1999). **Manual of industrial Microbiology and Biotechnology** ,2nd Edition , ASM Press.

Glazer AN and Nikaido H (2007)**Microbial Biotechnology**,2nd Edition,Cambridge University press.

Glick BR, Pasternak JJ,and Patten CL(2010) **Molecular Biotechnology** 4th Edition ,ASM PRESS.

Gupta PK (2009) **Elements of Biotechnology** 2nd Edition, Rastogi Publications.

D.K. GOVT COLLEGE (AUTONOMOUS) FOR WOMEN, NELLORE

BSc MICROBIOLOGY (CBCS) SYLLABUS

THIRD YEAR- SEMESTER-VI

PAPER –VII B

MBT.601- B ADVANCE IN MICROBIOLOGY

TOTAL HOURS :36 **CREDITS:3**

UNIT –I **No. of Hours :8**

Sallent features microbial genomes,core genome pool, flexible genome pool and concept of pangenome. Evolution of bacterial virulence- Genome pool, Pathogenicity Island (PAI) and their characteristics.

UNIT –II **No. of Hours :8**

Brief history and development of Metagenomics.Understanding bacterial diversity approach. Prospecting genes of biotechnological importance using metagenomics. Basic knowledge of Viral Metagenome,meta transcriptomics, metaproteomics and metabolomics.

UNIT –III **No. of Hours :8**

Epiphytic fitness and its mechanism in plant pathogens. Hypersensitive response (HR) to plant pathogens and its mechanism. Type three system(TTSS) of plant and animal pathogens.

UNIT –IV **No. of Hours :5**

Biofilms: Types of microorganisms, molecular aspects and signification in environment, health care, virulence and antimicrobial resistance.

UNIT –V **No. of Hours :7**

Networking in biological system, Quorum sensing in bacteria. Co-ordinated regulation of bacterial virulence factors. Basics of synthesis of polliovirus in laboratory. Future implications of synthetic biology with respect to bacteria and viruses.

MBT.601- B ADVANCE IN MICROBIOLOGY

PRACTICAL SYLLABUS

TOTAL HOURS :36 **CREDITS:2**

1.Extraction of metagenomics DNA from soil.

2. To understand the impediments in extracting metagenomics DNA from soil.

3.PCR amplification of metagenomics DNA using universal 16s ribosomal gene primers.

4.Case study to understand the how the poliovirus genome was synthesized in the laboratory.

5.Case study to understand how networking Metabloic pathway in bacteria takes place.

SUGGETED READING

Fraser CM, Read TD and Nelson KE. Microbial Genomes , 2004. Human press

Miller RV Day MJ. Microbial Evolution-Gene establishment , survival and exchange, 2004, ASM press

Bull AT.Microbial Diversity and Bioprospecting,2004 ASM press

Sangdum C.Indroduction to system Biology,2007.Humana press.

Klipp E, Liebermeister W. System Biology-A Text book.2009.Wiley –VCH Verlag

Caetano –Anolles G. Evolutionary Genomics and Sysytem Biology,2010.John Wile Y and Sons.

Voit EO(2072)A First Course in System Biology. 1st edition .Garland Science.

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D.K. GOVT COLLEGE (AUTONOMOUS) FOR WOMEN, NELLORE

BSc MICROBIOLOGY (CBCS) SYLLABUS

THIRD YEAR- SEMESTER-VI

MBT.601- C INSTUMENTATION AND BIOTECHNIQUES

TOTAL HOURS :36 **CREDITS:3**

UNIT –I **No. of Hours :6**

Bright field and dark field Microscopy,Fluorescence Microscopy,UV Microscopy, Phase contrast Microscopy, and Micrometry

UNIT –II **No. of Hours :8**

Principles and applications of Paper chromatography column packing and fraction collection. Concept of Gel filtration chromatography, Ion-exchange chromatography. GLC and HPLC.

UNIT –III **No. of Hours :6**

Principles and applications of native polyacrylamide gel electrophoresis,SDS- polyacrylamide gel electrophoresis,2D gel electrophoresis and isoelectronic focusing.

UNIT –IV **No. of Hours :6**

Principles and applications of study of absorption and Emission Spectra of biomolecules. Analysis of biomolecular using UV – Vis spectrophotometry,Centrifugation.Turbidometry.

UNIT –V **No. of Hours :8**

Principle of centrifugation, RCF and sedimentation coefficient, fixed angle and swinging bucket rotors. Preparative and analytical centrifugation, density gradient centrifugation and ultracentrifugation.

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MBT.601- C INSTUMENTATION AND BIOTECHNIQUES

PRACTICAL SYLLABUS

TOTAL HOURS :36 **CREDITS:2**

1.Study of fluorescent micrographs to visualize bacterial cells.
2. Ray diagrams of phase contrast microscopy and electron microscopy.
3.Separation of mixture by paper/thin layer chromatography.
4.Demonstration of column packing in any form of column chromatography.
5.Separation of protein mixture by form of chromatography.
6. Separation of protein mixture by polyacrylamide gel electrophoresis (PAGE), Agarose gel electrophoresis.
7.Determination of for an unknown sample and calculation of extinction coefficient.
8.Separation of components of a given mixture using a laboratory scale centrifuge
9. Understand the density gradient centrifugation with the help of pictures.
10.Estimation of DNA by diphenyl amine method
11.Estimation of protein by Lowry method.

SUGGESTED BOOKS

Nelson DL and Cox MM. (2008) .Lehniger priciplees of Biochemistry.5th Ed. W.H.Freeman and Company

Willey MJ, Sherwood LM & Woolverton C.J.(2013). Prescott. Harley and Klein'sMicrobiology.9th Ed.,McGraw Hill.

Krap G.(2010) Cell and Molecular Biology:Concepts and Experiments.6th edition.Jhon wiley & sons.Inc.

De Robertis EDP and and De Robertis EMF.(2006).The Cell and molecular biology.8th Edition Lipincott William and Wilkins, Pjiladelphia.

Cooper G.M. and Hausman R.E.(2009).The Cell and : A Molecular Approch.5th Edition.ASM press & Sunderland , Washington D.C.,sinauer Associates MA.

D.K. GOVT COLLEGE (AUTONOMOUS) FOR WOMEN, NELLORE 2.41

B.Sc MICROBIOLOGY (CBCS) SYLLABUSSEMESTER-VI

Cluster Elective I; paper- VIII (II) a

MBT – 603 A MICROBES IN SUSTAINABLE AGRICULTURE

TOTAL HOURS: 36 **CREDITS:3**

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

Soil as Microbial Habitat, Soil properties. Diversity and distribution of microorganisms in soil. Mineralization of cellulose, hemicelluloses, lignin, phosphate nitrate.

UNIT-II **No .of Hours: 6**

Carbon dioxide, Methane, Nitrous oxide, nitric oxide-production and control

UNIT-III **No .of Hours: 6**

Agri-composting and Vermi-composting

UNIT-IV **No .of Hours: 8**

Plant growth promoting bacteria, biofertilizers- symbiotic (Bradyrhizobium, Rhizobium, Frankia), Non Symbiotic (Azospirillum, Azotobacter, Mycorrhizae, MHBs, Phosphate solubilizers, algae). Novel combination of microbes as biofertilizers, PGPRs.

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

Biotech feed, Silage, Biomanure, Biogas, Biofuels- advantages and processing parameters. Advantages, social and environmental aspects of GM crops, BT crops golden rice.

MBT – 603 A MICROBES IN SUSTAINABLE AGRICULTURE

TOTAL HOURS: 36 **CREDITS:2**

1. Study of soil profile.
2. Study of micro flora of different types of soil
3. Rhizobium as soil inoculants characteristics and field applications
4. Azotobacter as soil inoculants characteristics and field applications
5. Design and functioning of a biogas plant
6. Isolation of cellulose degrading organisms

SUGGESTED READINGS

1. Agrios GN. (2006). Plant pathology. 5th edition. Academic press, San Diego
2. Singh RS.(1998). Plant diseases management. 7th edition. Oxford & IBH , New Delhi.
3. Glick BR, Pastemark JJ, & Patten CL (2010) Molecular biotechnology 4t edition , ASM Press
4. Altman A (1998). Agriculture Biotechnology, 1st edition, Marcel Decker Inc
5. Mahindra K Rai. (2005) Handbook of microbial biofertilizers, The Haworth press Inc. Ltd.
6. Saleem F & shakoori AR (2012) Development of Bioinsecticides, Lap Lambert Academy Publishing GmbH KG

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D.K. GOVT COLLEGE (AUTONOMOUS) FOR WOMEN, NELLORE

B.Sc MICROBIOLOGY (CBCS) SYLLABUS SEMESTER-VI

Cluster Elective I; paper- VIII (II) b

MBT-603 B BIOFERTILIZERS AND BIOPESTICIDES

TOTAL HOURS: 36 **CREDITS:3**

UNIT-I **No. of Hours: 10**

Advantages of Biofertilizers over Chemical fertilizers. Symbiotic N2 fixers: Rhizobium- Isolation, Characteristics, types, inoculums production and field application, legume/ pulses plants.

Frankia from non-legumes and characterization.
Cyanobacteria from Azolla, characterization, mass multiplication, Role in rice cultivation, Crop response, field application.

UNIT-II **No .of Hours: 6**

Free living Azospirillum, Azotobacter- isolation, characteristics, mass inoculums, production and field application.

UNIT-III **No .of Hours: 6**

Phosphate solubilizing microbes- Isolation, characterization, mass inoculum production, field application.

UNIT-IV **No .of Hours: 8**

Importance of mycorrhizal inoculums, types of Mycorrhizae and associated plants, mass inoculums production of VAM, Field application of Ectomycorrhizae and VAM.

UNIT-V **No .of Hours: 7**

General account of microbes used as Bioinsecticides and their advantages over synthetic pesticides. Bacillus thuringenesis- production, field applications. Viruses- NPV cultivation and field applications.

MBT-603 B BIOFERTILIZERS AND BIOPESTICIDES

TOTAL HOURS: 36 **CREDITS: 2**

1. Isolation of Rhizobium from root nodules. & cultivation
2. Isolation of phosphate solubilizers from soil.
3. Staining and observation of VAM.
4. A visit to biofertilizer production unit.

SUGGESTED READINGS

1. Agarwal SK (2005) Advanced Environmental Biotechnology, APH publication.
2. Kannaiyan, S.(2003). Biotechnology of Biofertilizers, CHIPS, Texas.
3. Mahindra K Rai. (2005) Handbook of microbial biofertilizers, The Haworth press Inc. Ltd. New Delhi
4. Saleem F & shakoori AR (2012) Development of Bioinsecticides, Lap Lambert Academy Publishing GmbH KG
5. Reddy, S.M. et. Al. (2002). Bioinoculants for sustainable agriculture and forestry, Scientific Publishers.
6. Subba Rao n.s (1995) Soil microorganisms and plant growth Oxford and IBH publishing co. Pvt. Ltd. New Delhi.

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D.K. GOVT COLLEGE (AUTONOMOUS) FOR WOMEN, NELLORE

B.Sc MICROBIOLOGY (CBCS) SYLLABUSSEMESTER-VI

Cluster Elective I; paper- VIII (II) C

MBT-603 C MUSHROOM CULTIVATION

TOTAL HOURS: 36 **CREDITS: 2**

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

History and scope of mushroom cultivation. Types of edible mushrooms available in India. Mushroom morphology. Different parts of a typical mushroom & variations in mushroom morphology. Button, paddy straw & Oyster- General Morphology, distinguishing characteristics.

UNIT-II **No .of Hours: 6**

Classification based on occurrence, natural habitats, color of spores, morphology of fruiting layers, structure and texture of fruiting bodies. Key to differentiate edible from poisonous mushrooms. Economic importance of edible mushrooms.

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

Cultivation of Button, Oyster and paddy straw Mushrooms: Collection of raw materials, compost & composting, spawn & spawning, casing & case run, cropping, picking & packing, marketing.

UNIT-IV **No .of Hours: 6**

Nutritional profile of mushrooms, health benefits of mushrooms. Mushroom Toxins and illness, mushroom recipes.

UNIT-V **No .of Hours: 7**

Effect of physical and chemical factors on the growth of mushrooms. Crop management during spawn running, casing to mushroom period, the cropping period. Post harvest management.

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MBT-603 C MUSHROOM CULTIVATION

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TOTAL HOURS: 36 **CREDITS:2**

1. Microscopic and anatomical observations of different mushroom species..
2. Preparation of spawn under controlled conditions (preparation of mother spawn in saline bottle and polypropylene bag and their multiplication.
3. Types of compost preparation and sterilization.
4. Mushroom bed preparation- paddy straw, sugarcane trash, maize straw, banana leaves/waste.
5. Spawning, casing, Cropping and harvesting.
6. Substrate preparation, bed preparation, spawning and cropping.
7. Diseases of mushrooms (photographs).
8. Visit to relevant Labs/field Visits

SUGGESTED READINGS

1. Mushroom cultivation, Tripathi, D.P. (2005) Oxford & IBH Publishing Co. PVT. LTD, New Delhi.
2. Mushroom production and processing technology, pathak yadhav Gour (2010) published by Agro bios (India).
3. A handbook of edible mushroom, S. Kannaiyan & K. Ramaswamy (1980). Today & Tomorrows printers & publishers, New Delhi.
4. Handbook on Mushrooms, Nita Bahl, Oxford & IBH Publishing Co.

REVISED SYLLABUS - 30.3.2019

&

PATTERN OF QUESTION PAPER

AFTER BOARD OF STUDIES MEETING

(2019-20)

BSc MICROBIOLOGY (CBCS) SYLLABUS

FIRST YEAR-SEMESTER-I

INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY

TOTAL HOURS: 48 **CREDITS: 3**

UNIT-I No.of hours :10

History and mile stones in Microbiology

Contributions of Antony Von Leewenhock, Edward Jenner, Louis Pasteur, Robert Koch, Ivanowsky.

Importance and applications of microbiology

Classification of Microorganisms-Haeckel's three kingdom concept, Whittaker's five kingdom concept, three domain concept of Carl woese

Outline classification of bacteria as per the second edition of Bergey's manual of systematic Bacteriology(up to classes only)

UNIT-II No.of hours: 10

General characteristics of Bacteria, Archea, mycoplasmas, Cyanobacteria.

Ultra structure of Prokaryotic cell- Variant components and invariant components.

General Characteristics of viruses

Morphology, Structure and replication of TMV and HIV.

Replications of Bacteriophage (T4).

UNIT-III No.of hours: 10

General characteristics of Algae,fungi and protozoa(up to classes only)

Principles of Microscopy- Bright field, phase contrast and Electron microscopy.

UNIT-IV No.of hours: 8

Staining Techniques-simple and differential (Gram staining and Spore staining) Hanging drop method.

Sterilization and disinfection techniques- Physical methods- autoclave, hot-air oven, Radiation methods-UV rays, Gamma rays

Chemical methods- alcohols, phenols, Aldehydes, fumigants; Filtration methods HEPA Filters-Laminar Airflow Microspore filtration.

UNIT-V No.of hours:10

Isolation of Microorganisms from natural habitats

Pure culture techniques- dilution-plating, streak –plate, Spread-plate, Pour-plate and Enrichment culturing

Preservation of microbial cultures- subculturing, overlaying cultures with mineral oils, lyophilisation, sand cultures, storage at low temperature.

MBP- 101 INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY

Practical syllabus

SEMESTER-I

TOTAL HOURS: 48 CREDITS: 2

1. Microbiology Good Laboratory Practices and Biosafety.

2. Preparation of culture media for cultivation of bacteria,fungi.

3. Sterilization of medium using Autoclave

4. Sterilization of glassware using Hot Air Oven

5. Light compound microscope and its handling

6. Simple staining , Gram's staining

7.Lactophenol cotton blue staining for fungi

8.Microscopic observation of bacteria (Gram +ve bacilli and cocci, Gram -ve bacilli), Cyanobacteria, Algae and Fungi.

9.. Hanging-drop method.

10. Isolation of pure cultures of bacteria by streak plate, pour plate and spread plate method.

11. Diagramatic or Electron photomicrographic observation of TMV, HIV, T4 phage and Adenovirus

TEXT BOOKS:

1. **An introduction to Microbiology**, A.P.Telugu Academy
2. **Introduction to Microbiology–**R.P.singh
3. **Pelczar,M.**J.,Chan, E.C.S, and Kreig, N.R.(1993). **Microbiology. 5th Edition**

Reference book

1. Atlas,R.A and Bartha.R (2000).**Microbial Ecology**. **Fundamentals and Application**, Benjamin Cumings, New York.
2. Dube,R.C. and Maheswari, D.K.(2000) **General Microbiology**. S Chand, New Delhi. Himalaya Publishing House Mumbai.
3. Madigan, M.T. Martinkl,J.M. and Parker,J.(2010). **Brock Biology of Microorganisms,** 9th Edition.MacMillan Prwess, England.
4. Prescott,M.J., Harley, J.P. and Klein, D.A.(2010). **Microbiology.** 5th Edition WCB Mc GrawHIll,New York.
5. Singh, R.P.(2007) **General Microbiology,** Kalyani Publishers, New Delhi.
6. Ram Reddy, S And Reddy, S.M.(2007)**Essential of Virology.** Scientific Publishers, India, Jodhpur.

D.K. GOVT COLLEGE (AUTONOMOUS) FOR WOMEN, NELLORE 2019-20

BSc MICROBIOLOGY (CBCS) SYLLABUS

FIRST YEAR-SEMESTER-II

MBT- 201 : MICROBIAL BIOCHEMISTRY & METABOLISM

TOTAL HOURS: 48 CREDITS: 3

UNIT-I No. of hours: 10

Outline classification and general characteristics of carbohydrates (monosaccharides, disaccharides and polysaccharides).

General characteristics of amino acids and proteins.

Structure of nitrogenous bases, nucleotides, nucleic acids.

Fatty acids (saturated and unsaturated)

Lipids (spingolipds, sterols and phospholipids)

UNIT-II No. of hours: 8

Principle and applications of - Colorimetry

Chromatography (paper, thin-layer and column),

Gel Electrophoresis.

UNIT-III No. of hours: 10

Properties of enzymes – Simple, Conjugated; Coenzymes, Cofactors.

IUB system of enzyme Classification.

Mechanism of enzyme action.

Factors affecting catalytic activity.

Inhibition of enzyme activity – competitive, non competitive, incompetitive and allosteric.

UNIT-IV No. of hours: 10

Microbial Nutrition –Nutritional requirements and uptake of nutrients by cells.

Nutritional groups of microcroorganisms- autotrophs, heterotrophs, mixotrophs and methylotrophs.

Growth media- synthetic,complex, selective, enrichment and differential media.

Microbial Growth- different phases of growth in batch cultures, Synchronous, continuous, biphasic growth.

Factors influencing microbial growth.

Methods for measuring microbial growth – Direct microscopy, viable count estimates, turbiodometry and biomass.

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

Aerobic respiration -Glycolysis, HMP path way, ED path way, TCA cycle, Electron transport,

Oxidative and substrate level phosphorylation.

Anaerobic respiration, Fermentation - Alcohol and lactic acid fermentations. Outlines of oxygenic and anoxygenic photosynthesis in bacteria.(Light reaction,

Cyclic & Noncyclic photophoshorylation)Calvin cycle.

D.K. GOVT COLLEGE (AUTONOMOUS) FOR WOMEN, NELLORE

PRACTICAL SYLLABUS

MBP- 201: MICROBIAL BIOCHEMISTRY & METABOLISM

TOTAL HOURS: 48 CREDITS: 2

1. Qualitative Analysis of Carbohydrates
2. Qualitative Analysis of Aminoacids
3. Colorimetric estimation DNA by Diphenylamine method
4. Colorimetric estimation of proteins by Biuret method
5. Paper chromatographic separation of sugars and amino acids
6. Turbidometric measurement of bacterial growth
7. Setting and observation of Winogradsky column.
8. Bacterial growth curve.
9. Factors affecting bacterial growth – pH.
10. Factors affecting bacterial growth – Temperature.
11. Factors affecting bacterial growth –Salts

TEXT BOOKS:

1. **Text Book of Microbiology** (Microbial Physiology and Genetics Telugu Academy).
2. **Microbial physiology and Genetics** – R.P .Singh.
3. **General Microbiology** - Pelczar.
4. **Biochemistry**-U. Satyanarayana

SUGGESTED READING

1. Lehninger,A.L.,Nelson, D.L. and Cox, M.M.(1993). **Principles of Biochemistry**,2nd Edition, CBS Publishers and Distributions, New Delhi.
2. Madigan M.T., Martinkl, J.M and Parker, J.(2010).**Brock Biology of Microorganisms**,9th Edition,MacMillan Press,England.
3. Prescott, M.J., Harley, J.P. and Klein, D.A. (2010). **Microbiology**. 5th Edition, WCB Mc GrawHill,
4. Reddy, S.R. and Reddy, S.M. (2004). **Microbial Physiology**, Scientific Publishers, Jodhpur, India

D.K. GOVT. COLLEGE FOR WOMEN(A),NELLORE
MICROBIOLOGY
PRACTICAL MODEL QUESTION PAPER

I YEAR II SEMESTER
PAPER-II-MICROBIOLOGY
MICROBIAL BIOCHEMISTRY AND METABOLISM

Time: 3Hours **Max. Marks:50**

Answer all questions

1. Major **15m**
2. Minor 10m
3. Identify the spotters and write a brief note on them 15m
   a.
   b.
   c.

4.record 5m

5.Viva 5m

TOTAL **50 MARKS**

SECOND YEAR – SEMESTER- III

MBT- 301 MICROBIAL GENETICS AND MOLECULAR BIOLOGY

TOTAL HOURS:48 **CREDITS: 3**

UNIT-I No. of hours: 10

Nucleic acids – DNA
Structure and organization of prokaryotic DNA
Extrachromosomal genetic elements – Plasmids and transposons.
Replication of DNA – Semi conservative mechanism, Enzymes involved in replication.

UNIT-II No. of hours: 10

Mutations - spontaneous and induced, base pair changes,frame shifts,deletions, inversions, tandem duplications, insertions.
Mutagens - Physical and Chemical mutagens.
Outlines of DNA damage and repair mechanisms.
Genetic recombination in bacteria-Conjugation, Transformation and Transduction.

UNIT-III No. of hours: 10

Concept of gene – Traditional and Modern - Muton, Recon and Cistron. One gene one enzyme and one gene polypeptide hypotheses.
Types of RNA and their functions.
Genetic code.
Structure of ribosomes.

UNIT-IV No. of hours: 8

Types of genes – structural, constitutive, regulatory.
Protein synthesis – Transcription and translation.
Regulation of gene expression in bacteria – lac operon.

UNIT-V No. of hours: 10

Basic principles of genetic engineering.
Restriction endonucleases, DNA polymerases and ligases.
Vectors – PBR 322, PUC 101. Polymerase chain reaction.Genomic and cDNA libraries.
Outlines of gene cloning methods.
General account on application of genetic engineering in industry, agriculture and medicine.

MBP- 301 MICROBIAL GENETICS AND MOLECULAR BIOLOGY

PRACTICAL SYLLABUS

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 (Demonstration)

4. Estimation of DNA using UV spectrophotometer. (Demonstration)

5. Resolution and visualization of DNA by Agarose Gel Electrophoresis.

6. Resolution and visualization of proteins by Polyacrylamide Gel Electrophoresis (SDS-PAGE). (Demo)

7. Problems related to DNA Mutations.

8. Induction of mutations in bacteria by UV light.

9. Instrumentation in molecular biology – Ultra centrifuge, Transilluminator, PCR (through Photographs)

SUGGESTED READING

Crueger, W. and Crueger, A. (2000). Biotechnology: A Text Book of Industrial Microbiology, PrenticeHall of India Pvt. Ltd., New Delhi.

Freifelder, D. (1990). Microbial Genetics. Narosa Publishing House, New Delhi.

Freifelder, D. (1997).Essentials of Molecular Biology. Narosa Publishing House, New Delhi.

Glazer, A.N. and Nikaido, H. (1995). Microbial Biotechnology – Fundamentals of Applied Microbiology, W.H. Freeman and company, New York.

Glick, B.P. and Pasternack, J. (1998). Molecular Biotechnology, ASM Press, Washington D.C., USA.

Kannan, N. (2003).Hand Book of Laboratory Culture Medias, Reagents, Stains and Buffers. Panima Publishing Co., New Delhi.

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.

Nicholl, D.S.T. (2004). An Introduction to Genetic Engineering. 2 nd Edition. Cambridge University Press, London.

Old, R.W. and Primrose, S.B. (1994) Principles of Gene Manipulation, Blackwell Science Publication, New York.

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.

Turner, P.C., Mclennan, A.G., Bates, A.D. and White, M.R.H. (1998). Instant Notes in Molecular Biology, Viva Books Pvt., Ltd., New Delhi.

Twynan, R.M. (2003). Advanced Molecular Biology. Viva books Pvt. Ltd. New Delhi.

Verma, P.S. and Agarwal, V.K. (2004). Cell Biology, Genetics, Molecular Biology, Evolution and Ecology. S. Chand & Co. Ltd., New Delhi. Washington, D.C., USA.

D.K. GOVT. COLLEGE FOR WOMEN(A),NELLORE
MICROBIOLOGY

PRACTICAL MODEL QUESTION PAPER
II YEAR III SEMESTER
PAPER-III-MICROBIOLOGY
MICROBIAL GENETICS & MOLECULAR BIOLOGY

Time: 3Hours **Max. Marks:50**

Answer all questions

1. Major **15m**
2. Minor 10m
3. Identify the spotters and write a brief note on them 15m
   a.
   b.
   c.

4.record 5m

5.Viva 5m

TOTAL **50 MARKS**

SECOND YEAR – SEMESTER- IV

MBT- 401 IMMUNOLOGY AND MEDICAL MICROBIOLOGY

TOTAL HOURS: 48 **CREDITS: 3**

UNIT-I No. of hours: 10

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

Primary and secondary organs of immune system – thymus, bursa fabricus, bone marrow, spleen and lymph nodes.

Cells of immune system. - B and T lymphocytes, null cells, monocytes, macrophages, neutrophils, basophils and eosinophils.

UNIT-II No. of hours: 10

Antigens – types, chemical nature, antigenic determinants.

Factors affecting antigenicity.

Immunoglobulin – basic structure, types, properties and functions of immunoglobulins.

Types of antigen-antibody reactions - Agglutinations, Precipitation, Neutralization, complement fixation.

Labeled antibody based techniques – ELISA, RIA and Immunofluroscence.

Polyclonal and monoclonal antibodies – production and applications - MBA

Concept of hypersensitivity and Autoimmunity.

UNIT-III No. of hours: 10

Normal flora of human body.

Host pathogen interactions: infection, invasion, pathogenicity, virulence and opportunistic infections.

General principles of diagnostic microbiology- collection, transport and processing of clinical samples.

General methods of laboratory diagnosis - cultural, biochemical, serological and molecular methods.

UNIT-IV No. of hours: 8

Antibacterial Agents- Penicillin,Rifamycin and Tetracycline.

Antifungal agents – Amphotericin B, Griseofulvin

Antiviral substances - Amantadine and Acyclovir

Tests for antimicrobial susceptibility.

Brief account on antibiotic resistance in bacteria - Methicillin-resistant Staphylococcus aureus (MRSA),MD Tuberculosis.

Vaccines – Natural and recombinant.

UNIT-V No. of hours: 10

General account of microbial diseases – causal organism, pathogenesis, epidemiology, diagnosis, prevention and treatment

Bacterial diseases – Tuberculosis and Typhoid

Fungal diseases – Candidiasis.

Protozoal diseases – Malaria.

Viral diseases - Hepatitis- B and AIDS,H1N1 ,Ebola.

MBP- 401 IMMUNOLOGY AND MEDICAL MICROBIOLOGY

PRACTICAL SYLLABUS

TOTAL HOURS: 48 CREDITS: 2

1. Identification of human blood groups.

2. Separation of serum from the blood sample (demonstration).

3. Estimation of blood haemoglobin in sahli method

4. Total RBC Count of the given blood sample using haemocytometer.

5. Differential Leukocyte Count of the given blood sample.

6. Immunodiffusion by Ouchterlony double diffusion method.

7. Identify bacteria (E. coli, Pseudomonas, Staphylococcus, Bacillus) using laboratory strains on the basis of cultural, morphological and biochemical characteristics: IMVIC, urease production and catalase tests.

8. Isolation of bacterial flora of skin by swab method.

9. Antibacterial sensitivity by Kirby-Bauer method. Identifiation of diseases bosed on the symtoms.

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 TEST BOOKS.

1. Immunology by Nandinishetty .

2. Text book of Microbiology by R Anantanarayana.

SUGGESTED READING

Abbas AK, Lichtman AH, Pillai S. (2007). Cellular and Molecular Immunology. 6th edition Saunders Publication, Philadelphia.

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

Brooks G.F., Carroll K.C., Butel J.S., Morse S.A. and Mietzner, T.A. (2013)

Jawetz, Melnick and Adelberg's Medical Microbiology. 26th edition. McGraw Hill Publication

Delves P, Martin S, Burton D, Roitt IM. (2006). Roitt's Essential Immunology.11th edition WileyBlackwell Scientific Publication, Oxford.

Goering R., Dockrell H., Zuckerman M. and Wakelin D. (2007) Mims' Medical Microbiology. 4th edition. Elsevier

Goldsby RA, Kindt TJ, Osborne BA. (2007). Kuby's Immunology. 6th edition W.H. Freeman and Company, New York.

Kuby's Immunology. 6th edition W.H. Freeman and Company, New York. Jawetz, Melnick and Adelberg's Medical Microbiology. 26th edition.McGraw Hill Microbiology. 4th edition. Elsevier Publication

Richard C and Geiffrey S. (2009). Immunology. 6th edition. Wiley Blackwell Publication.

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

D.K. GOVT. COLLEGE FOR WOMEN(A),NELLORE
MICROBIOLOGY
PRACTICAL MODEL QUESTION PAPER
II YEAR IV SEMESTER
PAPER-IV-MICROBIOLOGY
IMMUNOLOGY AND MEDICAL MICROBIOLOGY

Time: 3Hours **Max. Marks:50**

Answer all questions

1. Major **15m**
2. Minor 10m
3. Identify the spotters and write a brief note on them 15m
   a.
   b.
   c.

4.record 5m

5.Viva 5m

TOTAL **50 MARKS**

D.K. GOVT COLLEGE (AUTONOMOUS) FOR WOMEN, NELLORE

BSc MICROBIOLOGY (CBCS) SYLLABUS

THIRD YEAR- SEMESTER-V

501 ENVIRONMENTAL & AGRICULTURAL MICROBIOLOGY

Total Hours:36 **CREDITS:3**

UNIT-I No.of hours:8

Terrestrial Environment: Soil profile and soil Microflora

Aquatic Environment :Microflora of fresh water and marine habitats

Atmosphere: Aeromicroflora and dispersal of microbes

Extreme Habitats,Extremophiles: temperature,pH,Pressures Salinity.

UNIT- II No.of hours:8

Role of Microorganism in nutrient cycling(Carbon,nitrogen,phosphorus). Treatment and safety of drinking (potable) water,methods to detect portability of water samples:(a)Standard qualitative procedure: presumptive test /MPN test, confirmed test and Completed tests for feacal coliforms (b) Membrane filter techniques,

Microbialinteraction:Mutualism,commensalism,antagonism,competition,

parasitism,predation.

UNIT- III No.of hours:6

Outline of Solid waste management: Sources and types of Solid waste,Methods of solid waste disposal(composting and sanitary landfills)

Liquid waste management: composition and strength of Sewage(BOD and COD), primary ,secondary,(oxidation ponds, trickling filters, activated sludge process and septic tank)and tertiary sewage treatment

UNIT- IV No.of hours:7

Plant Growth Promoting Microorganism-Mycorrhizae,Rhizobia,Azospirillum Azotobacter,Frankia.

Phasphate-solubilizers and cyanobacteria.

Outlines of biological nitrogen fixation (symbiotic, non-symbiotic)

Biofertilisers- Rhizobium

UNIT- V No.of hours:7

Concept of disease in plants, symptoms of plant diseases caused by fungi , bacteria and viruses,

plant disease- groundnut rust, Citrus canker and tamota leaf curl

priciples of plant disease control

501-ENVIRONMENTAL & AGRICULTURAL MICROBIOLOGY

Practical syllabus

1.Analysis of soil pH, Moisture content and water holding capasity.

2. Isolation of microbes(Bacteria and fungi) from soil.

3.Study of air flora by petri plate exposure

4.Analysis of potable water: SCP,presumptive,confirmed and completed test ,determination of coliform count in water MPN.

5.Determination of biological oxygen demand (BOD) of waste water sample.

6.Isolation of Rhizobium from root nodules.

7.Staining and observation of Vesicular Arbuscular Mycorrhizal (VAM) fungi.

8.Observation of plant diseases of local importance Citrus canker, tikka disease of ground nut , Bhendi yellow vein mosaic ,Rust , Smuts, Powdery mildews, Tamota leaf curl.

MODEL PAPER FOR SEMESTER END EXAMINATIONS

B.Sc MICROBIOLOGYIII YEAR SEMESTER-V PAPER-V

PRACTICAL MODELQUESTIONPAPER

MBT 501: ENVIROMENTAL & AGRICULTURAL MICROBIOLOGY

Time: 3Hours **Max. Marks:50**

Answer all questions

1. Major **15m**
2. Minor 10m
3. Identify the spotters and write a brief note on them 15m
   a.
   b.
   c.

4.record 5m

5.Viva 5m

TOTAL **50 MARKS**

D.K. GOVT COLLEGE (AUTONOMOUS) FOR WOMEN, NELLORE

BSc MICROBIOLOGY (CBCS) SYLLABUS

THIRD YEAR- SEMESTER-V PAPER-VI

MBT-502 FOOD AND INDUSTRIAL MICROBIOLOGY

TOTAL HOURS: 36 CREDITS:3

UNIT-I No.of hours: 8

Intrinsic and extrinsic parameters that effects microbial growth in food
Microbial spoilage of food-fruits, vegetables, milk, meat and canned foods
Food infection(salmonellosis) and Food intoxication (Botulism)

UNIT-II No.of hours:7

Principles of food preservation-physical and chemical methods.
Fermented and dairy foods-cheese and yogurt.
Microbes as food-SCP, edible mushrooms (white button, oyster and paddy starw). probiotics and their benefits.

UNIT-III No.of hours :6

Microorganisms of industrial importance-yeasts, (Saccharomyces cerevisiae)
Moulds, (Aspergillus niger) Bacteria(E.coli), actinomycets(streptomyces griseus).
Isolation and screening and Outline of strain improvement of industrially-important microorganisms.

UNIT-IV No.of hours : 8

Types of fermentation processes-solid state, liquid state,batch,fed-batch, and continuous.
Basic concepts of Design of fermentor.
Ingredients of fermentation media
Downstream processing-filtration, centrifugation, cell disruption, solvent extraction.

UNIT-V No.of hours:7

Microbial production of industrial products: citric acid, Ethanol, Amylase, penicillin, Glutamic acid, and vitamin B12

MBT-502 FOOD AND INDUSTRIAL MICROBIOLOGY

Practical syllabus

1. Isolation of bacteria and fungi from spoiled bread/fruits/Vegetables.
2. Methylene blue dye reduction test(MBRT).
3. Disinfection of selected instruments and equipment's.
4. Crowd plate technique.
5. Production of Alcohol
6. Standard qualitative analysis of water.
7. Quantitative analysis of water- membrane filter method/MPN.
8. Analysis of food samples for mycotoxins.(Demonstration)
9. Estimation of Citric acid

MODEL PAPER FOR SEMESTER END EXAMINATIONS

B.Sc MICROBIOLOGYIII YEAR SEMESTER-V PAPER-VI

PRACTICAL MODELQUESTIONPAPER

MBT601: FOOD AND INDUSTRIAL MICROBIOLOGY

Time: 3Hours **Max. Marks:50**

Answer all questions

1. Major **15m**
2. Minor 10m
3. Identify the spotters and write a brief note on them 15m
   a.
   b.
   c.

4.record 5m

5.Viva 5m

TOTAL **50 MARKS**

D.K. GOVT COLLEGE (AUTONOMOUS) FOR WOMEN, NELLORE

BSc MICROBIOLOGY (CBCS) SYLLABUS

THIRD YEAR- SEMESTER-VI

PAPER -VIIA

MBT.601- AMICROBIAL BIOTECHNOLOGY

TOTAL HOURS :36 **CREDITS:3**

UNIT –I **No. of Hours :8**

Microbial Biotechnology:Scope and its applications in human therapeutics and environment (Bioremediation of Xenobiotics).

Genetically engineered microbes for industrial application: Bacteria and Yeast.

UNIT –II **No. of Hours :7**

Recombinant microbial production processes Pharmaceutical industries –Streptokinase

Recombinant vaccines(Hepatitis B vaccine).

Microbial Polysaccharides, Polyesters and Bioplastics.

Microbial biosensors

UNIT –III **No. of Hours :10**

Microbial based transformation of steroids

Biocatalytic processes their industrial application: Production of high

Fructose corn syrup and Production of cocoa butter substitute.

Immobilization methods and their application.

UNIT –IV **No. of Hours :7**

Bioethanol and Biodiesel production: commercial production from lignocellulosic waste and algal biomass.

Biogas production: Methane production using microbial culture.

Bio leaching.

UNIT –V **No. of Hours :4**

Outlines of Intellectual Property Rights: Patents. Copyrights, Trademarks

MBT.601- A MICROBIAL BIOTECHNOLOGY

PRACTICAL SYLLABUS

TOTAL HOURS :36 **CREDITS:2**

1.Yeast cell immobilization in calcium alginate gels

2.Pigment production from fungi/bacteria.

3.Isolation of protease/xylanase/lipase production bacteria

4.Study of algal Single Cell Proteins.

SUGGESTEED READING

Crueger W, Crueger A(1990) Biotechnology: **A tect book of IndustrialMicrobiology** 2nd edition Sinauer associates, Inc

Demain, A. L and Daviies , J.E(1999). **Manual of industrial Microbiology andBiotechnology** ,2nd Edition , ASM Press.

Glazer AN and Nikaido H (2007)**Microbial Biotechnology**,2nd Edition,Cambridge University press.

Glick BR, Pasternak JJ,and Patten CL(2010**) Molecular Biotechnology** 4th Edition ,ASM PRESS.

Gupta PK (2009) **Elements of Biotechnology** 2nd Edition, Rastogi Publications.

D.K. GOVT COLLEGE (AUTONOMOUS) FOR WOMEN, NELLORE

BSc MICROBIOLOGY (CBCS) SYLLABUS

THIRD YEAR- SEMESTER-VI

PAPER –VII B

MBT.601- BADVANCE IN MICROBIOLOGY

TOTAL HOURS :36 **CREDITS:3**

UNIT –I No. of Hours :8

Salient features microbial genomes,core genome pool, flexible genome pool and concept of pangenome. Evolution of bacterial virulence- Genome pool, Pathogenicity island (PAI) and their characteristics**.**

UNIT –II No. of Hours :8

Brief history and development of Metagenomics.Understanding bacterial diversity approach. Prospecting genes of biotechnological importance using metagenomics. Basic knowledge of Viral Metagenome,meta transcriptomics, metaproteomics and metabolomics.

UNIT –III No. of Hours :8

Epiphytic fitness and its mechanism in plant pathogens. Hypersensitive response (HR) to plant pathogens and its mechanism.Type three system(TTSS) of plant and animal pathogens**.**

UNIT –IV No. of Hours :5

Biofilms: Types of microorganisms, molecular aspects and signification in environment, health care, virulence and antimicrobial resistance.

UNIT –V No. of Hours :7

Networking in biological system, Quorum sensing in bacteria. Co-ordinated regulation of bacterial virulence factors. Basics of synthesis of poliovirus in laboratory. Future implications of synthetic biology with respect to bacteria and viruses.

MBT.601- B ADVANCE IN MICROBIOLOGY

PRACTICAL SYLLABUS

TOTAL HOURS :36 **CREDITS:2**

1.Extraction of metagenomics DNA from soil.

2. To understand the impediments in extracting metagenomics DNA from soil.

3.PCR amplification of metagenomics DNA using universal 16s ribosomal gene primers.

4.Case study to understand the how the poliovirus genome was synthesized in the laboratory.

5.Case study to understand how networking Metabloic pathway in bacteria takes place.

SUGGETED READING

Fraser CM, Read TD and Nelson KE. Microbial Genomes , 2004. Human press

Miller RV Day MJ. Microbial Evolution-Gene establishment , survival and exchange, 2004, ASM press

Bull AT.Microbial Diversity and Bioprospecting,2004 ASM press

Sangdum C.Indroduction to system Biology,2007.Humana press.

Klipp E, Liebermeister W. System Biology-A Text book.2009.Wiley –VCH Verlag

Caetano –Anolles G. Evolutionary Genomics and Sysytem Biology,2010.John Wile Y and Sons.

Voit EO(2072)A First Course in System Biology. 1st edition.Garland Science.

BSc MICROBIOLOGY (CBCS) SYLLABUS

THIRD YEAR- SEMESTER-VI

MBT.601- C INSTUMENTATION AND BIOTECHNIQUES

TOTAL HOURS :36 CREDITS:3

UNIT –I **No. of Hours :6**

Bright field and dark field Microscopy,Fluorescence Microscopy,UV Microscopy, Phase contrast Microscopy, and Micrometry

UNIT –II **No. of Hours :8**

Principles and applications of Paper chromatography column packing and fraction collection. Concept of Gel filtration chromatography, ion-exchange chromatography.GLC andHPLC.

UNIT –III **No. of Hours :6**

Principles and applications of native polyacrylamide gel electrophoresis,SDS- polyacrylamide gel electrophoresis,2D gel electrophoresis and isoelectronic focusing.

UNIT –IV **No. of Hours :6**

Principles and applications of study of absorption and Emission Spectra of biomolecules. Analysis of biomolecular using UV – Vis spectrophotometry,Centrifugation.Turbidometry.

UNIT –V **No. of Hours :8**

Principle ofcentrifugation,RCF and sedimentation coefficient, fixed angle and swinging bucket rotors. Preparative and analytical centrifugation,density gradient centrifugation and ultracentrifugation.

MBT.601- C INSTUMENTATION AND BIOTECHNIQUES

PRACTICAL SYLLABUS

TOTAL HOURS :36 **CREDITS:2**

1.Study of fluorescent micrographs to visualize bacterial cells.

2. Ray diagrams of phase contrast microscopy and electron microscopy.

3.Separation of mixture by paper/thin layer chromatography.

4.Demonstration of column packing in any form of column chromatography.

5.Separation of protein mixture by form of chromatography.

6. Separation of protein mixture by polyacrylamide gel electrophoresis (PAGE), Agarose gel electrophoresis.

7.Determination of for an unknown sample and calculation of extinction coefficient.

8.Separation of components of a given mixture using a laboratory scale centrifuge

9. Understand the density gradient centrifugation with the help of pictures.

10.Estimation of DNA by diphenyl amine method

11.Estimation of protein by Lowry method.

SUGGESTED BOOKS

Nelson DL and Cox MM. (2008) .Lehniger priciplees of Biochemistry.5th Ed. W.H.Freeman and Company

Willey MJ, Sherwood LM & Woolverton C.J.(2013). Prescott. Harley and Klein'sMicrobiology.9th Ed.,McGraw Hill.

Krap G.(2010) Cell and Molecular Biology:Concepts and Experiments.6th edition.Jhon wiley & sons.Inc.

De Robertis EDP and and De Robertis EMF.(2006).The Cell and molecular biology.8th Edition Lipincott William and Wilkins, Pjiladelphia.

Cooper G.M. and Hausman R.E.(2009).The Cell and : A Molecular Approch.5th Edition.ASM press & Sunderland , Washington D.C.,sinauer Associates MA.

D.K. GOVT. COLLEGE FOR WOMEN(A),NELLORE
MICROBIOLOGY
PRACTICAL MODEL QUESTION PAPER
III YEAR VI SEMESTER

PAPER-VII-MICROBIOLOGY ELECTIVE
INSTUMENTATION AND BIOTECHNOLOGY

Time: 3Hours **Max. Marks:50**

Answer all questions

1. Major **15m**
2. Minor 10m
3. Identify the spotters and write a brief note on them 15m
   a.
   b.
   c.

4.record 5m

5.Viva 5m

TOTAL **50 MARKS**

B.Sc MICROBIOLOGY (CBCS) SYLLABUSSEMESTER-VI

Cluster Elective 1; paper- VIII (I) A

MBT – 602A DIAGNOSTIC MICROBIOLOGY

TOTAL HOURS: 36 CREDITS: 3

UNIT-I No. of Hours: 8

Causative agent and symptoms of bacterial, viral, fungal and protozoan diseases of various human body
systems: nervous (meningitis, encephalitis, cryptococcosis, trypanosomiasis) respiratory (tuberculosis,
influenza, histoplasmosis, toxoplasmosis), gastrointestinal (typhoid. Hepatitis, candidiasis, amoebiasis),
urogential systems (Nongonococcal urethritis, genital herpes, candidiasis Trichomoniasis). Disease associated
clinical samples for diagnosis.

UNIT-II No .of Hours: 8

Collection of clinical samples (oral cavity, throat, skin, blood, CSF, urine and faeces) and precautions required.

Method of transport of clinical samples to laboratory and storage.

UNIT-III No of.Hours: 8

Examination of sample by staining-Gram stain. Ziehl-Neelson Staining for tuberculosis, Giemsa-stained thin

blood film for malaria.

Preparation and use of culture media- Blood agar, Chocolate agar, Lowenstein-Jensen medium, Mac Conkey

agar. Distinct colony properties of various bacterial Pathogens.

UNIT-IV No. of. Hours: 6

Diagnosis of Typhoid, Dengue, HIV and Swine flu using Serological Methods- Agglutination, ELISA,

Immunofluroscence, Nucleic acid based methods- PCR, Nucleic acid probes.

UNIT- V No. of. Hours: 6

Importance of determination of sensitivity/resistance of bacteria using disc diffusion method, Determination

of minimal inhibitory concentration (MIC) of an antibiotic by serial double dilution method.

MBT – 602A DIAGNOSTIC MICROBIOLOGY

TOTAL HOURS: 36 **CREDITS:2**

1. Collection, transport and processing of clinical specimens (Blood, Urine, Stool and Sputum). Receipts,

Labeling, recording and dispatching clinical specimens.

2. Isolation of bacteria in pure culture and Antibiotic sensitivity.

3. Identification of common bacteria (Staphylococcus, Streptococcus, E. coli by studying their

morphology, cultural characters, Biochemical reactions, agglutination and other tests.

4. Maintenance and preservation of stock culture.

SUGGESTED READINGS

1. Ananthanarayan R and Paniker CKJ (2009) Text book of Microbiology, 8 th edition. Universities Press

Private Limited.

2. Brooks G.F., Carroll K.C., Butel J.S., Morse S.A. and Mietzner. T.A. (2013) Jawetz. Melnick and

Adelberg's Medical Microbiology 26 th edition Mc Graw Hill Publication.

3. Collee JG, Fraser, AG, Marmion BP Simmons A (2007)Mackie and McCartney Practical Medical

Microbiology, 14 th edition, Elsevier.vc

4. Randhawa, VS, Mehta G and Sharma KB (2009) Practicals and Viva in Medical Microbiology 2 nd edition,

Elsevier India Pvt Ltd.

5. Title P (2013) Bailey's and Scott's Diagnostic Microbiology..13 th edition ,, Mosby

B.Sc MICROBIOLOGY (CBCS) SYLLABUSSEMESTER-VI

Cluster Elective 1; paper- VIII (I) b

MBT- 602B MICROBIAL QUALITY CONTROL IN FOOD AND PHARMACEUTICAL INDUSTRIES

TOTAL HOUR: 36 **CREDITS: 3**

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

Good laboratory practices- Good morphological practices. Biosafety cabinets- Working of Biosafety cabinets, using protective clothing, specification for BSL-1, BSL-2, BSL-3. Discarding biohazardous waste- Methodology of Disinfection, Autoclaving & Incineration.

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

Culture and microscopic methods – Standard plate count, most probable numbers, direct microscopic counts, Biochemical and immunological methods: Litmus lysate test for endotoxin, gel diffusion, sterility testing for pharmaceutical products

UNIT-III **No .of Hours: 8**

Molecular methods- Nucleic acid probes, PCR based detection, biosensors.

UNIT-IV **No. of Hours: 8**

Enrichment culture techniques for detection of specific microorganisms – on XLD agar, Salmonella Shigella agar, Mannitol salt agar, EMB agar, Mac Conkey agar, Saboraud agar. Ascertaining microbial quality of milk by MBRT. Rapid detection methods of microbiological quality of milk at milk collection centers (COB, 10min reassuring assay).

UNIT-V **No. of hours: 4**

Hazard analysis of critical point (HACCP)- principles, flow diagrams, limitations. Microbial standards for different foods and water-BIS standards for common foods and drinking water. QC&QA, warehousing, sample testing in pharma industry.

MBT-602B MICROBIAL QUALITY CONTROL IN FOOD AND PHARMACEUTICAL INDUSTRIES

TOTAL HOURS: 36 **CREDITS: 2**

1. Microbilogical laboratory safety- general rules & regulations.
2. Sterility tests for instruments – autoclave & hot air oven
3. Disinfection of selected instruments & equipments
4. Sterility of air and its relationship to laboratory & hospital sepsis.
5. Sterility testing of microbiological media
6. Sterility testing of pharmaceutical products n- antibiotics, vaccines & fluids
7. Standard qualitative analysis of water – membrane filter method
8. Analysis of food samples for mycotoxins.

SUGGESTED READING

1. Baird RM, Hodges NA and denyer SP (2005) Handbook of Microbiological Quality Control in Pharmaceutical and Medical Devices, Taylor and Francis Inc.
2. Garg N, Garg KL and Mukerji KG (2010) Laboratory Manual of Food Microbiology I K International Publishing House Pvt. Ltd.
3. Harrigan WF (1998) Laboratory Methods in Food Microbiology 3rd edition. Academic Press.
4. Pharmaceutical Microbiology- Purohit.
5. Pharmaceutical Microbiology-W.B. Hugo.

D.K. GOVT COLLEGE (AUTONOMOUS) FOR WOMEN, NELLORE

B.Sc MICROBIOLOGY (CBCS) SYLLABUSSEMESTER-VI

Cluster Elective I; paper- VIII (I) C

MBT – 602 C BIOINFORMATICS

TOTAL HOURS: 36 **CREDITS: 3**

UNIT-I **No. of Hours: 6**

RDBMS-Definition of relational database

Mode of data transfer (FTP, SFTP, SCP), advantage of encrypted data transfer

UNIT-II **No .of Hours: 7**

Bioinformatics- Its Definitions, Introduction, History. Bioinformatics- Objectives, Applications, Its need, Scope, Careers. Bioinformatics scenario in India & the rest of the world. Sequences used in Bioinformatics-DNA, protein, RNA. Dawn of sequencing. Brief understanding of DNA, Protein, and RNA molecules.

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

Local and Global Sequence alignment, pair wise and multiple sequence alignment. Scoring alignment, scoring matrices. Types of phylogenetic trees, Different approaches of phylogenetic tree construction- UPGMA, Neighbor joining, Maximum Parsomony, Maximum likelihood.

UNIT-IV **No .of Hours: 7**

Local and Global Sequence alignment, pair wise and multiple sequence alignment. Scoring alignment, scoring matrices. Types of phylogenetic trees, Different approaches of phylogenetic tree construction- UPGMA, Neighbor joining, Maximum Parsomony, Maximum likelihood.

UNIT-V **No .of Hours:9**

Diversity of Genomes: Viral, Prokaryotic & eukaryotic genomes Genome, transcriptome, proteome, 2-D Gel electrophoresis, Maldi Toff spectroscopy Major features of completed genomes: F.Coli, S.Cerevisiae , Human Hierarchy of protein structure – primary, secondary and tertiary structures , modeling Structural Classes, Motifs, Folds andDomains.

Protein structure prediction in presence and absence of structure template.

MBT – 602 C BIOINFORMATICS

TOTAL HOURS:36 **CREDITS:3**

1. Introduction to different operating systems-UNIX, LINUX, and Windows.
2. Introduction to bioinformatics databases (any three): NCBJ.
3. Sequence retrieval using BLAST.
4. Sequence alignment & phylogenetic analysis using clustal W & phylip.
5. Picking out a given gene from genomes using Gensacnor other softwares (promoter region identification, repeat in genome, ORf prediction). Gene finding tools (Glimmer, GENSCAN), Primer designing, Genscan/Genetool.
6. Protein structure prediction: primary structure analysis, secondary structure prediction using psi-pred, homology modeling using Swiss model.
7. Prediction of different features of a functional gene

SUGGESTED READINGS

1. Andreas (2004) Bioinformatics- A practical guide to the analysis of genes & protein 2nd ED Baxevanis and Francis Ouellette.
2. Christian Crumlish The internet (1999). BPB Publications.
3. K. Mani & N. Vijayaraj Bioinformatics for the beginners
4. Lesk M.A.(2008) Introduction to Bioinformatics Oxford publication,3rd International Student Edition
5. Pennington & Dunn (2002) proteomics; Viva book publishers, New Delhi.
6. Preeti (2007) Foundations of Computing, 4th edition. BPB Publications.

D.K. GOVT COLLEGE (AUTONOMOUS) FOR WOMEN, NELLORE 2019-20

B.Sc MICROBIOLOGY (CBCS) SYLLABUSSEMESTER-VI

Cluster Elective I; paper- VIII (II) a

MBT – 603 A MICROBES IN SUSTAINABLE AGRICULTURE

TOTAL HOURS: 36 **CREDITS:3**

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

Soil as Microbial Habitat, Soil properties. Diversity and distribution of microorganisms in soil. Mineralization of cellulose, hemicelluloses, lignin, phosphate nitrate.

UNIT-II **No .of Hours: 6**

Carbon dioxide, Methane, Nitrous oxide, nitric oxide-production and control

UNIT-III **No .of Hours: 6**

Microorganisms used as biocontrol agents against plant pathogens, insects, weeds vermi compost.

UNIT-IV **No .of Hours: 8**

Plant growth promoting bacteria, biofertilizers- symbiotic (Bradyrhizobium, Rhizobium, Frankia), Non Symbiotic (Azospirillum, Azotobacter, Mycorrhizae, Phosphate solubilizers, algae). Novel combination of microbes as biofertilizers.

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

Biotech feed, Silage, Biomanure, Biogas, Biofuels- advantages and processing parameters. Advantages, social and environmental aspects of GM crops, Bt crops golden rice.

MBT – 603 A MICROBES IN SUSTAINABLE AGRICULTURE

TOTAL HOURS: 36 **CREDITS:2**

1. Study of soil profile.
2. Study of micro flora of different types of soil
3. Rhizobium as soil inoculants characteristics and field applications
4. Azotobacter as soil inoculants characteristics and field applications

5. Design and functioning of a biogas plant
6. Isolation of cellulose degrading organisms

SUGGESTED READINGS

1. Agrios GN. (2006). Plant pathology. 5th edition. Academic press, San Diego
2. Singh RS.(1998). Plant diseases management. 7th edition. Oxford & IBH , New Delhi.
3. Glick BR, Pastemark JJ, & Patten CL (2010) Molecular biotechnology 4t edition , ASM Press
4. Altman A (1998). Agriculture Biotechnology, 1st edition, Marcel Decker Inc
5. Mahindra K Rai. (2005) Handbook of microbial biofertilizers, The Haworth press Inc. Ltd.
6. Saleem F & shakoori AR (2012) Development of Bioinsecticides, Lap Lambert Academy Publishing GmbH KG

D.K. GOVT COLLEGE (AUTONOMOUS) FOR WOMEN, NELLORE

B.Sc MICROBIOLOGY (CBCS) SYLLABUSSEMESTER-VI

Cluster Elective I; paper- VIII (II) b

MBT-603 B BIOFERTILIZERS AND BIOPESTICIDES

TOTAL HOURS: 36 **CREDITS:3**

UNIT-I **No. of Hours: 10**

Advantages of Biofertilizers over Chemical fertilizers. Symbiotic N2 fixers: Rhizobium- Isolation, Characteristics, types, inoculums production and field application, legume/ pulses plants.

Frankiafrom non-legumes and characterization. Cyanobacteria from Azolla, characterization, mass multiplication, Role in rice cultivation, Crop response, field application.

UNIT-II **No .of Hours: 6**

Free living Azospirillum, Azotobacter- isolation, characteristics, mass inoculums, production and field application.

UNIT-III **No .of Hours: 6**

Phosphate solubilizing microbes- Isolation, characterization, mass inoculum production, field application.

UNIT-IV **No .of Hours: 8**

Importance of mycorrhizal inoculums, types of Mycorrhizae and associated plants, mass inoculums production of VAM, Field application of Ectomycorrhizae and VAM.

UNIT-V **No .of Hours: 7**

General account of microbes used as Bioinsecticides and their advantages over synthetic pesticides. Bacillus thuringenesis- production, field applications. Viruses- NPV cultivation and field applications.

MBT-603 B BIOFERTILIZERS AND BIOPESTICIDES

TOTAL HOURS: 36 **CREDITS: 2**

1. Isolation of Rhizobium from root nodules and cultivation.
2. Isolation of phosphate solubilizers from soil.
3. Staining and observation of VAM.
4. A visit to biofertilizer production unit.

SUGGESTED READINGS

1. Agarwal SK (2005) Advanced Environmental Biotechnology, APH publication.
2. Kannaiyan, S.(2003). Biotechnology of Biofertilizers, CHIPS, Texas.
3. Mahindra K Rai. (2005) Handbook of microbial bio fertilizers, The Haworth press Inc. Ltd. New Delhi
4. Saleem F & shakoori AR (2012) Development of Bio insecticides, Lap Lambert Academy Publishing GmbH KG
5. Reddy, S.M. et. Al. (2002). Bio inoculants for sustainable agriculture and forestry, Scientific Publishers.
6. Subba Rao n.s (1995) Soil microorganisms and plant growth Oxford and IBH publishing co. Pvt. Ltd. New Delhi.

D.K. GOVT COLLEGE (AUTONOMOUS) FOR WOMEN, NELLORE

B.Sc MICROBIOLOGY (CBCS) SYLLABUSSEMESTER-VI

Cluster Elective I; paper- VIII (II) C

MBT-603 C MUSHROOM CULTIVATION

TOTAL HOURS: 36 **CREDITS: 2**

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

History and scope of mushroom cultivation. Types of edible mushrooms available in India. Mushroom morphology. Different parts of a typical mushroom & variations in mushroom morphology. Button, paddy straw & Oyster- General Morphology, distinguishing characteristics.

UNIT-II **No .of Hours: 6**

Classification based on occurrence, natural habitats, color of spores, morphology of fruiting layers, structure and texture of fruiting bodies. Key to differentiate edible from poisonous mushrooms. Economic importance of edible mushrooms.

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

Cultivation of Button, Oyster and paddy straw Mushrooms: Collection of raw materials, compost & composting, spawn & spawning, casing & case run, cropping, picking & packing, marketing.

UNIT-IV **No .of Hours: 6**

Nutritional profile of mushrooms, health benefits of mushrooms. Mushroom Toxins and illness, mushroom recipes.

UNIT-V **No .of Hours: 7**

Effect of physical and chemical factors on the growth of mushrooms. Crop management during spawn running, casing to mushroom period, the cropping period. Post harvest management.

MBT-603 C MUSHROOM CULTIVATION

TOTAL HOURS: 36 **CREDITS:2**

1. Microscopic and anatomical observations of different mushroom species..
2. Preparation of spawn under controlled conditions (preparation of mother spawn in saline bottle and polypropylene bag and their multiplication.
3. Types of compost preparation and sterilization.
4. Mushroom bed preparation- paddy straw, sugarcane trash, maize straw, banana leaves/waste.

5. Spawning, casing, Cropping and harvesting.
6. Substrate preparation, bed preparation, spawning and cropping.
7. Diseases of mushrooms (photographs).
8. Visit to relevant Labs/field Visits

SUGGESTED READINGS

1. Mushroom cultivation, Tripathi, D.P. (2005) Oxford & IBH Publishing Co. PVT. LTD, New Delhi.
2. Mushroom production and processing technology, pathak yadhav Gour (2010) published by Agro bios (India).
3. A handbook of edible mushroom, S. Kannaiyan & K. Ramaswamy (1980). Today & Tomorrows printers & publishers, New Delhi.
4. Handbook on Mushrooms, Nita Bahl, Oxford & IBH Publishing Co.

D.K. GOVT. COLLEGE FOR WOMEN(A),NELLORE
MICROBIOLOGY
THEORY MODEL QUESTION PAPER
I YEAR I SEMESTER
PAPER-I-MICROBIOLOGY
INTRODUCTION TO MICROBIOLOGY&MICROBIAL DIVERSITY

Time: 3Hours **Max. Marks:70**

SECTION-A

Answer any FIVE of the following questions. 5x2=10

1. Define pasteruization
2. Robert Koch
3. HEPA filters
4. Liophilization
5. Electron microscope
6. Autoclave
7. Streak plate
8. Mycoplasma

SECTION-B

Answer any FIVE of the following 5x4=20

9. How radiation can be used for sterilizing the objects
10. Koch's postulates
11. Write a short note on mode of reproduction in moulds
12. Describe the structure of TMV
13. Enrichment culturing
14. Classification of fungi
15. Microspore filtaration
16. Hot air Oven

SECTION-C

Answer ALL question .Each carries 8 marks 5x8=40

UNIT-I

17.a.List of the contribution of Antony von leeuwen hock and Edward jenner

Or

b.Give an account on the classification proposed by Haeckel and Whittaker.

18.a.Write a note on general characteristics of mycoplasma and cyanabacteria .

Or

b.Write an essay on general characteristics and classification of Viruses

19.a.Give an account on variant components of prokaryotes.

Or

b.Write the principles and function of electron microscope.

20.a.write an essay on any two differential staining techniques.

Or

b.Define sterilization ?write a detailed account on chemical methods of sterilization.

21.a.Write a note on pure culture techniques.

Or

b.Describe various methods of preservation of pure cultures

D.K. GOVT. COLLEGE FOR WOMEN(A),NELLORE
MICROBIOLOGY
THEORY MODEL QUESTION PAPER
I YEAR II SEMESTER
PAPER-II-MICROBIOLOGY
MICROBIAL BIOCHEMISTRY AND METABOLISM

Time: 3Hours **Max. Marks:70**

SECTION-A

Answer any FIVE of the following questions. 5x2=10

1. Monosaccharides
2. Methylotrophs
3. Allosteric enzymes
4. Nucleotides
5. SDS
6. Biphasic growth
7. Spingo lipds
8. Mixotrophs

SECTION-B

Answer any FIVE of the following 5x4=20

9.Amino acids

10.Co enzymes and cofactors

11.Application of spectrophotometry

12.outlines of gel electrophoresis

13.Synchronous culture

14.ED pathway

15.Anarobic respiration

16.Thin layer chromatography

SECTION-C

Answer ALL question .Each carries 8 marks 5x8=40

17.What are corbohydrates ?Give outline classification of corbohydrates

Or

Write a note on spingo lipids and phospholipids

18.what is the principles of working of calorimeter. Give its applicatiction

Or

What is Gel electrophoresis? Write about its applications

19.Define nutrition ?Explain the diversity in nutritional requirement of microorganisms with example.

Or

Describe the methods of measuring microbial growth.

20.Define enzyme?write a note on various properties of enzymes

Or

Write a detailed account on various factors of enzymes which effects catalytic activity of enzymes

21.Give an account on TCA cycle

Or

Write briefly about alcohol and lactic acid fermentation.

D.K. GOVT. COLLEGE FOR WOMEN(A),NELLORE
MICROBIOLOGY
THEORY MODEL QUESTION PAPER
II YEAR III SEMESTER
PAPER-III-MICROBIOLOGY
MICROBIAL GENETICS & MOLECULAR BIOLOGY

Time: 3Hours **Max. Marks:70**

SECTION-A

Answer any FIVE of the following questions. 5x2=10

1.Mutagens
2.mRNA
3.Polymerase
4.Plasmids
5.Regulatory gene
6.PBR 322
7.Ligase
8.Recon

SECTION-B

Answer any FIVE of the following 5x4=20

9.Transposons
10.Topoisomerase
11.DNA damage
12.Ribosomes
13.PCR
14.Genomic library
15.RNA polymerase
16.One gene one enzyme hypothesis

SECTION-C

Answer ALL question .Each carries 8 marks 5x8=40

UNIT-I

17.(a)Describe the Nucleic acids? Write a note on Extrachromosomal elements.

OR

(b).Define replication? Describe briefly about semi conservative Replication.

UNIT-II

18.Write an essay on types of mutation.

OR

(b). Describe protein synthesis?

UNIT-III

19.(a).Write a note on types of RNA and their functions**?**

OR

(b). Write about the Genetic code?

UNIT-IV

20. Detailed explanation of structure of prokaryotic promoters

OR

Define Operon concept?write a note on Lac-operon?

UNIT-V

21. Write an essay Outlines of gene cloning method?

OR

Write a General accont on applications of genetic engineering in agricultural and medicine?

D.K. GOVT. COLLEGE FOR WOMEN(A),NELLORE
MICROBIOLOGY
THEORY MODEL QUESTION PAPER
II YEAR IV SEMESTER
PAPER-IV-MICROBIOLOGY
IMMUNOLOGY AND MEDICAL MICROBIOLOGY

Time: 3Hours **Max. Marks:70**

SECTION-A

Answer any FIVE of the following **5x2=10**

1.Monocytes
2. Ebola
3.Antigen
4.Null cells
5.Macrophages
6.Thymus
7.Infection
8.H1N1 flu

SECTION-B

Answer any FIVE of the following **5x4=20**

9.Cell mediate immunity
10.Autoimmunity
11.Antibacterial agents
12.Antiviral substance
13.Monoclonal antibodies
14.Normal flora of skin
15. write about neutrophils and basophils
16.Cultural method of laboratory

SECTION-C

Answer ALL question .Each carries 8 marks **5x8=40**

17.Define immunity?Write a note on innate immunite acquired immunity

Or

Write a note on primary organs of immune system

18. Write a detailed note on types of immunoglobulins

Or

Write an essay on labelled antibody based techniques

19.write a general methods of laboratory microbiology.

Or

Write a general principles of diagnostic microbiology

20.Give a general account on antibacterial agents

Or

Give a detailed account on various tests for antimicrobial susceptibility

21.General on account organism,pathogenesis,epidermiology,diagnosis, prevention and treatment of tuberculosis and typhoid

.

Or

Write a note on Hepatitis B and AIDS

MODEL PAPER FOR SEMESTER END EXAMINATIONS

B.Sc MICROBIOLOGYIII YEAR SEMESTER-V PAPER-V

THEORYMODELQUESTIONPAPER

MBT 501: ENVIROMENTAL & AGRICULTURAL MICROBIOLOGY

Time: 3hrs **SECTION-A** **max marks:60**

Answer any FIVE of the following questions . **5x4=20**

1. Extremophiles.
2. MPN
3. Antagonism
4. BOD
5. Marine Microflora
6. Rhizobium
7. Citrus Canker
8. Non Symbiotic nitrogen fixation

SECTION-B **5X8=40**

9.a.Describe Soil Profile and Soil Microflora

Or

b.Write about Aeromicroflora and dispersal of microbes

10.a.Explain microbial interaction

Or

b.Discuss the role of Microorganisms in Carbon cycle

11.a.Give an account on Sewage treatment

Or

b.Write the methods of Solid waste disposal.

12.a.Discribe plant growth promoting microorganisms

Or

b.Write in detail about biological symbiotic nitrogen fixation

13.a. Discuss the symptoms of plant diseases caused by fungi and virus

Or

b. Describe the concept of and principles of plant disease control.

MODEL PAPER FOR SEMESTER END EXAMINATIONS

B.Sc MICROBIOLOGYIII YEAR SEMESTER-V PAPER-VI

THEORYMODELQUESTIONPAPER

MBT601: FOOD AND INDUSTRIAL MICROBIOLOGY

SECTION-A max marks:60

Answer any FIVE of the following questions . 5x4=20

1.Food intoxication.

2.probiotics.

3.fermentors.

4.salmonellosis.

5.Amylase production.

6.Indrustrial importance actinomycets.

7.Ingredient of fermentation media.

8.pencillin.

SECTION-B

Answer the all question choosing one question from each unit 5x8=40

UNIT-I

9. a. write about the intrinsic and extrinsic parameters that effect microbial in food.

OR

b. Describe microbial spoilage of food.

UNIT-II

10. a. Discuss the principles of food preservation.

OR

b. Write an essay of microorganisms as and fermenters dairy foods

UNIT-III

11. a. write about and isolation and screening of industrially importance of microoraganisms

OR

b. Explain method of strain improvement.

UNIT-IV

12. a. Discuss various types fermentation used in industry.

OR

b. Given account downstream processing.

UNIT-V

13. a. discuss the industry production of ethanol.

OR

b. write about microbial production of vitaminB12

D.K. GOVT. COLLEGE FOR WOMEN(A),NELLORE
MICROBIOLOGY
THEORY MODEL QUESTION PAPER
III YEAR VI SEMESTER
PAPER-VII-MICROBIOLOGY ELECTIVE
INSTUMENTATION AND BIOTECHNOLOGY

Time: 3Hours **Max. Marks:60**

SECTION-A

Answer any FIVE of the following **5x4=20**

1. HPLC
2. Micrometry.
3. Isoelectrofocusing.
4. RCF
5. Turbidometry.
6. Factors affecting electrophoretic Mobility.
7. Partition principle.
8. Dark field microscopy**.**

SECTION-B

Answer any FIVE of the following **5x8=40**

9.(a) .Describe about Fluoresencemicroscopy?

Or

(b).Write an essay on phase contrast microscopy?

10.(a).Describe principle, instrumentation and applications of Ion Exchange chromatography?

Or

(b). Describe principle, instrumentation and applications of paper chromatography?

11.(a).Explain details about SDS-PAGE?

Or

(b).Write about principle and application of 2D Gel Electrophoresis?

12.(a).Describe principle and application of study of absorption spectra of biomolecules?

Or

(b).Describe UV and Visible range spectrophometry?

13.(a).Explain about preparative and analytical centrifugation

Or

(b).Describe principle and application of Density gradient centrifugation

D.K. GOVT COLLEGE (AUTONOMOUS) FOR WOMEN, NELLORE

Department of Microbiology

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