

**MODEL QUESTION PAPER**  
**M.Sc. Microbiology**  
**1<sup>st</sup> Semester**  
**PAPER-1: MB 101: GENERAL MICROBIOLOGY**

Time: Three hours

Maximum: 85 marks

Answer ALL questions.

1. Write short notes on any FIVE of the following: 5 X 5 = 25 marks.
- (a) Write the contributions of Pasteur and Beijerinck.
  - (b) Explain briefly the structure and functions of bacterial cellwall.
  - (c) Briefly explain the concept of containment facility.
  - (d) Write a commonly used method for isolation of pure culture of bacterium.
  - (e) Distinguish between continuous and synchronous cultures.
  - (f) Distinguish between bacteria and mycoplasmas.
  - (g) Give a brief account of slime molds.
  - (h) Briefly explain the morphological features protozoa.

**UNIT-1**

2. (a) Discuss the kingdoms of organisms and phylogenetic tree. (15)
- Or
- (b) Explain the importance of Beragy's Manual in bacterial taxonomy.

**UNIT II**

3. (a) Write the special staining techniques for microscopic identification of Microorganisms. (15)
- Or
- (b) Explain the importance of selective, differential and maintenance Microbiology.

**UNIT III**

4. (a) Describe the reproduction and spore formation in bacteria. (15)

Or

- (b) Explain the biochemical methods for measurement of microbial growth.

**UNIT IV**

5. (a) Discuss the economic importance of fungi with examples. (15)

Or

- (b) Write on outline classification of algae by Fritsch.

**General Guidelines:**

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3. **Examiners should strictly adhere to these instructions.**  
Abbreviations: Q<sub>1</sub> = Question-1: Q<sub>2</sub> = Question-2: Q<sub>3</sub> = Question-3: Q<sub>4</sub> = Question-4

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**MODEL QUESTION PAPER**  
**M.Sc. Microbiology**  
**1<sup>st</sup> Semester**  
**PAPER-2: MB 102: VIROLOGY**

Time :Three hours

Maximum :85 marks

Answer ALL Questions.

1 Write short notes on any FIVE of the following: 5 X 5 = 25 marks.

- (a) Baculoviridae
- (b) Geminiviridae
- (c) Host range of viruses
- (d) Virion associated enzymes
- (e) Molecular associated enzymes
- (f) Interference
- (g) Viral Zoonosis
- (h) Viral disease surveillance.

**UNIT-I**

2 (a) Classify the RNA viruses of animals with examples. (15)

Or

(b) Write the characteristics of sub-viral agents of plants.

**UNIT-II**

3. (a) How do you assay the animal viruses ? (15)

Or

(b) Discuss the physical properties of viruses

**UNIT-III**

4. (a) Explain the immunological responses of Animal host to virus infections. (15)

Or

- (b) Discuss the genome diversity in DNBViruses.

**UNIT-IV**

5. (a) How does viruses gain entry into animal Hosts?

(15)

Or

- (b) Explain the influence of biological and Physical factors on the survival and spread of viruses.

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**MODEL QUESTION PAPER**  
**M.Sc. Microbiology**  
**1<sup>st</sup> Semester**  
**PAPER-3: MB 103: BIOMOLECULES**

Time : Three hours

Maximum : 85 marks

Answer ALL Questions.

1 Write short notes on any FIVE of the following: 5 X 5 = 25 marks.

- (a) Mutarotation
- (b) Lipoproteins
- (c) Ninhydrin reaction of amino acids
- (d) Ramachandran's plot
- (e) Z-DNA
- (f) Cytochromes
- (g) Chemical structure and organization of membranes
- (h) Oxidative phosphorylation.

**UNIT-I**

2. (a) Write the importance chemical reactions of Monosaccharides. (15)

Or

(b) What are phosphor lipids? Write their Chemical structures and functions.

**UNIT-II**

3. (a) Describe the secondary, tertiary and Quaternary structures of proteins. (15)

Or

(b) Describe the different methods of sequencing of proteins .

**UNIT-III**

4. (a) Describe the structure and functions of different types of RNAs. (15)

Or

- (b) Write the chemical structure, dietary sources, biochemical function and deficiency diseases of riboflavin and niacin.

**UNIT-IV**

5. (a) Describe the bacterial photosynthesis and the photosynthesis electron transport system.

(15)

Or

- (b) Describe the role of trace elements in Microbial enzymes.

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**MODEL QUESTION PAPER**

**M.Sc. Microbiology**

**1<sup>st</sup> Semester**

**PAPER-4: MB 104: ANALYTICAL TECHNIQUES**

Time : Three hours

Maximum : 85 marks

1. Write short notes on any FIVE of the following: 5 X 5 = 25 marks.
- (a) Fluorescent microscopy
  - (b) Negative staining technique
  - (c) TLC
  - (d) 2- electrophoresis
  - (e) Principles of colorimetry
  - (f) Optical rotatory dispersion.
  - (g) Units of radioactivity and isotopes
  - (h) RIA.

**UNIT-I**

- 2 (a) Write the principles of different types of Electron microscopy and their applications. (15)
- Or
- (b) Describe the sample preparation for Phase Contrast Microscopy highlighting its principle and applications.

**UNIT-II**

3. (a) Describe how sub cellular organelles can be separated by centrifugation. (15)
- Or
- (b) What is gel filtration? Describe how the Molecular weight of a protein can be determined by gel filtration.

**UNIT-III**

4. (a) Describe the essential components of a UV- Visible spectrophotometer and its use in Biochemical analysis. (15)

Or

- (b) Describe a method for determination of Osmotic pressure of a solution. How do you determine the molecular weight of a Molecule using osmotic pressure of a solution Containing the molecule?

#### **UNIT-IV**

5. (a) Describe the different methods of detection of radiation. (15)

Or

- (b) Explain manometric technique and its Applications.

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**MODEL QUESTION PAPER**

**M.Sc. Microbiology**

**2<sup>nd</sup> Semester**

**PAPER-1: MB 201: MICROBIAL PHYSIOLOGY AND METABOLISM**

Time ;Three hours

Maximum :85 marks

Answer ALL Questions.

1. Write short notes on any FIVE of the following : 5 X 5 = 25 marks.
- (a) Mixotrophs.
  - (b) Chemosynthetic bacteria
  - (c) C<sub>2</sub>--- C<sub>4</sub> Split P[<sub>2</sub> pathway.
  - (d) Lactic acid fermentation.
  - (e) Oxidative domination.
  - (f) Nitrogenase..
  - (g) Biosynthesis of phospholipids.
  - (h) Reductive catabolism.

**UNIT – I**

2. (a) Discuss the factors affecting the microbial Growth. (15)
- Or
- (b) Write on diversity of respiratory pathways in Microorganisms.

**UNIT -II**

3. (a) TCA cycle is an amphibolic pathway. Explain. (15)
- Or
- (b) Discuss the similarities and differences between anoxygenic phototrophic bacteria and oxygenic Phototrophs.

**UNIT- III**

4. (a) Explain the regulation biosynthesis of Tryptophan in microorganisms. (15)

Or

- (b) Write on assimilation of inorganic nitrogen and sulphur.

**UNIT- IV**

- 5 (a) Explain the biosynthesis and catabolism of Pyrimiding nucleotides in millcroorganisms.? (15)

Or

- (b) How secondary metabolites metabolites are utilized for the biosynthesis of antibiotics and hormones in microorganisms.

**General Guidelines:**

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**MODEL QUESTION PAPER**

**M.Sc. Microbiology**

**2<sup>nd</sup> Semester**

**PAPER-2: MB 202: ENZYMOLOGY AND CELL BIOLOGY**

Time: Three hours

Maximum: 85 marks

Answer ALL questions.

1. Write short notes on any FIVE of the following: 5 X 5 = 25 marks.

- (a) Lysosomes.
- (b) Photophosphorylation.
- (c) Protein kinases.
- (d) Coated vesicles.
- (e) Oxidoreductases.
- (f) Metalloenzymes.
- (g) Ribonuclease action.
- (h) ATcase.

**UNIT-I**

2. (a) Explain the structure and functions of Mesosomes and Cytoskeleton system. (15)

Or

(b) Write the structures and functions of Photosynthetic pigments.

**UNIT- II**

3. (a) Disruption of growth factor signaling can lead to cancer, Explain. (15)

Or

(b) Discuss the cell cycle regulation.

**UNIT- III**

4. (a) How do you determine  $K_m$ ,  $V_{max}$  and  $k_{cat}$  Values of an enzyme?. (15)

Or

- (b) Write the methods for the assay of enzymes.

**UNIT-IV**

5. (a) Compare the kinetics of immobilized and free Enzymes. (15)

Or

- (b) Explain the criteria for testing the purity of Enzyme preparations.

**General Guidelines:**

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**MODEL QUESTION PAPER**

**M.Sc. Microbiology**

**2<sup>nd</sup> Semester**

**PAPER-3: MB 203: MOLECULAR AND MICROBIAL GENETICS**

Time :Three hours

Maximum.:85marks

Answer ALL questions

1 Write short notes on any FIVE of the following : 5 X 5 = 25 marks.

- (a) Complementation.
- (b) RAPD.
- (c) Retransposons
- (d) Mutator genes.
- (e) Frame shift mutations.
- (f) Sexduction.
- (g) Generalized transduction.

**UNIT I**

2. (a) Explain recombination at molecular level. (15)
- Or
- (b) Discuss the organization of genomes in Prokaryotes.

**UNIT II**

3. (a) Write on structure and functions of different Bacterial transposons. (15)
- Or
- (b) How do you engineer the proteins by site Directed mutagenesis ?

**UNIT III**

4. (a) How do you isolate and analyze the mutants? (15)
- Or
- (b) Explain different DNA repair mechanisms.

**UNIT IV**

5 (a) Discuss Benzer's studies on r-II LOCUS of T4 bacteriophage. (15)

Or

(b) Relate between phenotypic changes and Environmental alterations.

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**MODEL QUESTION PAPER**  
**M.Sc. Microbiology**  
**2<sup>nd</sup> Semester**  
**PAPER-4: MB 204: IMMUNOLOGY**

Time : Three hours

Maximum : 85 marks

Answer ALL Questions

1. Write short notes on any FIVE of the following: 5 X 5 = 25 marks.

- (a) Radioimmunoassay
- (b) Immunological memory
- (c) Opsonins
- (d) All types and idiotypes
- (e) Cytokines
- (f) DNA vaccines
- (g) Nude mice
- (h) Serotherapy.

**UNIT 1**

2. (a) Explain different agglutination tests to study Antigen – antibody reactions. (15)

Or

(b) Write on innate immunity.

**UNIT II**

3. (a) Discuss the molecular basis for generation of Antibody diversity. (15)

Or

(b) Write applications of monoclonal Antibodies in biology and medicine

with examples.

**UNIT III**

4. (a) Explain the immune responses of host to Protozoan infections. (15)

Or

- (b) Write on antibody - dependent cell - mediated Cytotoxicity.

**UNIT IV**

5. (a) Discuss the functions of class I and II MHC Molecules. (15)

Or

- (b) Explain any three primary Immuno Deficiency diseases.

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**MODEL QUESTION PAPER**

**M.Sc. Microbiology**

**2<sup>nd</sup> Semester**

**NON-CORE PAPER: MB 207: PRINCIPLES OF MICROBIOLOGY**

Answer ALL Questions

Time: 3 hours.

Max . Marks: 85 marks

1. Write short notes on any FIVE of the following: 5 X 5 = 25 marks.

- (a) Bacterial growth curve.
- (b) General characters of viruses.
- (c) Conjunctivitis.
- (d) AIDS.
- (e) Koch's Postulates
- (f) Chemotherapy
- (g) Diarrhoea.
- (h)

**UNIT 1**

2. (a) Describe the general characters of Bacteria.

(15)

(Or)

(b) Write the different methods of sterilization highlighting their principles involved.

**UNIT II**

3 (a) Write an account of sexually transmitted diseases and their causative organisms.

(15)

(Or)

(b) Describe the pathology of Skin diseases of fungal Origin and their adverse effects.

**UNIT III**

4. (a) Describe the methods to determine Antibiotic Sensitivity of microorganisms and the different Antimicrobial agents.

(15)

(Or)

- (b) Discuss the different types of immunity and the cells and products involved in the immune response.

**UNIT 1V**

5. (a) Describe the role of different vectors in the Transmission of infective Diseases in humans.

(15)

(Or)

- (b) Write the pathogenesis of diseases caused by Solmonella and Epidermophyton, their diagnosis and treatment.

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**MODEL QUESTION PAPER**

**M.Sc. Microbiology**

**3<sup>rd</sup> Semester**

**PAPER-1: MB 301: MOLECULAR BIOLOGY**

Time: 3 hrs.

Max. Marks: 85

Answer all questions

1. Write short notes on any **five** of the following: 5 X 5 = 25 marks.
- a) Carcinogens.
  - b) Constitutive genes.
  - c) What is a  $\omega$  Clamp?
  - d) What is a promoter?
  - e) How are start and stop codons identified?
  - f) RNA Polymerase.
  - g) Nif Operon.
  - h) Post translational processing of proteins.

**UNIT-1:**

2. Write in detail about the experiments that led to prove DNA as the genetic material.

(15)

(Or)

What are the different types of tumors? Add a note on the chromosomal changes induced by carcinogens.

**UNIT-2:**

3. Write about the process and proteins involved in DNA replication.

(15)

(Or)

What is the mechanism of transcription? Add a note on transcriptional activators.

**UNIT-3:**

4. Explain the genetic code and its properties?

(15)

(Or)

Describe the mechanism of protein Synthesis.

**UNIT-4:**

5. Write about the regulation of lac operon.

(15)

(Or)

Write about the arabinose operon.

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**MODEL QUESTION PAPER**

**M.Sc. Microbiology**

**3<sup>rd</sup> Semester**

**PAPER-2: MB 302: MEDICAL MICROBIOLOGY**

Time: 3 hrs.

Max. Marks: 85

Answer all questions

1. Write short notes on any **five** of the following: 5 X 5 = 25 marks.

- a) Pathology of gonococcus.
- b) Shigellosis.
- c) Late diagnosis of Tuberculosis.
- d) Mucormycosis.
- e) Quartan Malaria.
- f) Drug Resistance in Bacteria.
- g) Antifungal drugs
- h) Interferon.

**UNIT-1:**

2. Describe the normal microbial flora of the human body. (15)

(Or)

Write about the pathology and lab diagnosis of Enterobacteriaceae.

**UNIT-2:**

3. Write about the description and pathology of diseases caused by intestinal flagellates. (15)

(Or)

Explain the various diseases caused by opportunistic fungi.

**UNIT-3:**

4. What is epidemiology? What is the significance of epidemiological studies? (15)

(Or)

Write down the principles of chemotherapy. Add a note on the problems of drug resistance in bacteria.

**UNIT-4:**

5. What are the various viruses affecting the respiratory tract? Describe. (15)

(Or)

Explain the different types of interferous and their induction.

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**MODEL QUESTION PAPER**

**M.Sc. Microbiology**

**3<sup>rd</sup> Semester**

**PAPER-3: MB 303: BIostatistics AND BIOinformatics**

Time: 3 hrs.

Max. Marks: 85

Answer all questions

1. Write short notes on any **five** of the following: 5 X 5 = 25 marks.

- a) Standard Deviation.
- b) t-Test Analysis.
- c) PAM Matrix.
- d) Edit Distance.
- e) Fragment Assembly
- f) Comparative Genomics.
- g) Threading.
- h) Energy minimization.

**UNIT-1:**

2. Discuss in detail about basic principles of theory of probability. (15)

(Or)

Write about Correlation and linear regression.

**UNIT-2:**

3. What is a database? Discuss about different types of database and add a note on their significance. (15)

(Or)

Discuss in detail about pair wise sequence alignment using Dynamic Programming

**UNIT-3:**

4. What is Phylogenetic tree? Discuss the construction of a Phylogenetic tree using Parsimony method and branch & bound method. (15)

(Or)

Explain the methodology of Peptide Sequencing using mass and spectroscopy data.

**UNIT-4:**

5. Discuss in detail about secondary structure prediction.

(15)

(Or)

Discuss in detail about tertiary structure prediction.

**General Guidelines:**

1. Q<sub>1</sub> consists 2 short note questions should be given from each unit. 4 units X 2 = 8 short note questions carries each question 5 marks. 5 X 5 = 25 marks.
2. Q<sub>2</sub> to Q<sub>5</sub>, all are **essay type questions only**. No short type and long type answers. 2 essay type questions from each unit with internal choice. Q<sub>2</sub>, Q<sub>3</sub>, Q<sub>4</sub> and Q<sub>5</sub> covers the syllabi from units 1, 2, 3 and 4 respectively i.e. both the essay questions in Q<sub>2</sub> must be given from **unit-1**. Similarly Q<sub>3</sub> from **unit 2**, Q<sub>4</sub> from **unit 3** and Q<sub>5</sub> from **unit 4** respectively. Each essay question carries 15 marks (Q<sub>2</sub> to Q<sub>5</sub>) ⇒ 4 questions x 15 marks = 60 marks. Totally 25 + 60 = 85 marks.
3. **Examiners should strictly adhere to these instructions.**  
Abbreviations: Q<sub>1</sub> = Question-1: Q<sub>2</sub> = Question-2: Q<sub>3</sub> = Question-3: Q<sub>4</sub> = Question-4

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**MODEL QUESTION PAPER**

**M.Sc. Microbiology**

**3<sup>rd</sup> Semester**

**PAPER-4: MB 304: MOLECULAR BIOTECHNOLOGY**

Time: 3 hrs.

Max. Marks: 85

Answer all questions

1. Write short notes on any **five** of the following: 5 X 5 = 25 marks.

- a) Maxane Gilberts Method.
- b) Homopolymer tailing
- c) Nitrocellulose membrane.
- d) Cosmids.
- e) Gene Therapy.
- f) cDNA microarrays.
- g) SNP
- h) Inkjetting.

**UNIT-1:**

2. Explain the principle and methodology of DNA Sequencing. (15)

(Or)

Write in detail about the principle involved in PCR, its types and application.

**UNIT-2:**

3. Explain the various cloning vectors used in r-DNA technology. (15)

(Or)

What is the significance of the various enzymes used in r-DNA technology?

**UNIT-3:**

4. Write in detail about the applications of r-DNA in various phases of life. (15)

(Or)

What are GEMS? Write few examples describing their significance.

**UNIT-4:**

5. What are the different types of DNA microarrays? Explain the different methods for the production and development of DNA microarrays.

(15)

(Or)

Explain the analysis of whole genomes for gene expression patterns using micro arrays.

**General Guidelines:**

1. Q<sub>1</sub> consists 2 short note questions should be given from each unit. 4 units X 2 = 8 short note questions carries each question 5 marks. 5 X 5 = 25 marks.
2. Q<sub>2</sub> to Q<sub>5</sub>, all are **essay type questions only**. No short type and long type answers. 2 essay type questions from each unit with internal choice. Q<sub>2</sub>, Q<sub>3</sub>, Q<sub>4</sub> and Q<sub>5</sub> covers the syllabi from units 1, 2, 3 and 4 respectively i.e. both the essay questions in Q<sub>2</sub> must be given from **unit-1**. Similarly Q<sub>3</sub> from **unit 2**, Q<sub>4</sub> from **unit 3** and Q<sub>5</sub> from **unit 4** respectively. Each essay question carries 15 marks (Q<sub>2</sub> to Q<sub>5</sub>) ⇒ 4 questions x 15 marks = 60 marks. Totally 25 + 60 = 85 marks.
3. **Examiners should strictly adhere to these instructions.**  
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**MODEL QUESTION PAPER**

**M.Sc. Microbiology**

**3<sup>rd</sup> Semester**

**NON-CORE PAPER: MB 307: APPLIED MICROBIOLOGY**

Time: 3 hrs.

Max. Marks: 85

Answer all questions

1. . Write short notes on any **five** of the following. 5 X 5 = 25 marks.

- (a) Blenders experiments
- (b) Shine Dahlgren sequence
- (c) Batch culture .
- (d) Continuous culture.
- (e) Microbial leaching.
- (f) Food chain.
- (g) Biofertilizers.

**UNIT-1:**

2. (a) What is Transcription. Explain how it transcribes in prokaryotes. (15)
- (Or)
- (b) What is Operon Concept, How regulation of gene expression takes place in Prokaryotes.

**UNIT-2:**

- 3 (a) Define Diurnal periodicity pattern. Explain the dispersal of airborne Microorganisms. (15)
- (Or)
- (b) Explain microbial growth kinetics.

**UNIT-3:**

- 4 (a) Describe the suet of microorganisms in recovery of the mineral (Uranium) from Ores. (15)
- (Or)

- (b) What is replication? How it takes place in Prokaryotes.

**UNIT-4:**

- 5 (a) Explain the methods of food preservation.

(15)

(Or)

- (b) What are Biofertilizers ?

**General Guidelines:**

1. Q<sub>1</sub> consists 2 short note questions should be given from each unit. 4 units X 2 = 8 short note questions carries each question 5 marks. 5 X 5 = 25 marks.
2. Q<sub>2</sub> to Q<sub>5</sub>, all are **essay type questions only**. No short type and long type answers. 2 essay type questions from each unit with internal choice. Q<sub>2</sub>, Q<sub>3</sub>, Q<sub>4</sub> and Q<sub>5</sub> covers the syllabi from units 1, 2, 3 and 4 respectively i.e. both the essay questions in Q<sub>2</sub> must be given from **unit-1**. Similarly Q<sub>3</sub> from **unit 2**, Q<sub>4</sub> from **unit 3** and Q<sub>5</sub> from **unit 4** respectively. Each essay question carries 15 marks (Q<sub>2</sub> to Q<sub>5</sub>) ⇒ 4 questions x 15 marks = 60 marks. Totally 25 + 60 = 85 marks.
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**MODEL QUESTION PAPER**

**M.Sc. Microbiology**

**4<sup>th</sup> Semester**

**PAPER-1: MB 401: FERMENTATION TECHNOLOGY AND INDUSTRIAL  
MICROBIOLOGY**

Time: 3 hrs.

Max. Marks: 85

Answer all questions

1. Write short notes on any **five** of the following: 5 X 5 = 25 marks.

- a) Antifoams.
- b) Primary screening.
- c) Fed batch culture.
- d) Kinetics of Batch culture.
- e) Bio-films.
- f) Microbial leaching of Uranium.
- g) IPR

**UNIT-1:**

2. Write in detail about the isolation and preservation of industrially important microorganisms? (15)

(Or)

What are the different media and materials used in industrial microbiology?

**UNIT-2:**

3. Explain the basic design of a fermentor. What are the different types of fermentors used? (15)

(Or)

What are the various water-borne diseases arising due to faecal pollution? Mention the indicator organisms.

**UNIT-3:**

4. Write short notes on the microbial production of (15)

- (a) Methyl mercury. (b) Tri-methyl arsine (c) H<sub>2</sub>S

(Or)

Explain the various processes involved in the treatment of sewage. Add a note on the significance of microorganisms.

**UNIT-4:**

5. Write about the role of microorganisms in the degradation of Oil spills and pesticides. (15)

(Or)

Write about the microbiological deterioration of paper and textiles and their prevention.

**General Guidelines:**

1. Q<sub>1</sub> consists 2 short note questions should be given from each unit. 4 units X 2 = 8 short note questions carries each question 5 marks. 5 X 5 = 25 marks.
2. Q<sub>2</sub> to Q<sub>5</sub>, all are **essay type questions only**. No short type and long type answers. 2 essay type questions from each unit with internal choice. Q<sub>2</sub>, Q<sub>3</sub>, Q<sub>4</sub> and Q<sub>5</sub> covers the syllabi from units 1, 2, 3 and 4 respectively i.e. the both essay questions in Q<sub>2</sub> must be given from **unit-1**. Similarly Q<sub>3</sub> from **unit 2**, Q<sub>4</sub> from **unit 3** and Q<sub>5</sub> from **unit 4** respectively. Each essay question carries 15 marks (Q<sub>2</sub> to Q<sub>5</sub>) ⇒ 4 questions x 15 marks = 60 marks. Totally 25 + 60 = 85 marks.
3. **Examiners should strictly adhere these instructions.**  
Abbreviations: Q<sub>1</sub> = Question-1: Q<sub>2</sub> = Question-2: Q<sub>3</sub> = Question-3: Q<sub>4</sub> = Question-4.

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**MODEL QUESTION PAPER**

**M.Sc. Microbiology**

**4<sup>th</sup> Semester**

**PAPER-2: MB 402: ENVIRONMENTAL MICROBIOLOGY**

Time: 3 hrs.

Max. Marks: 85

Answer all questions

1. Write short notes on any **five** of the following: 5 X 5 = 25 marks.

- a) Food Web.
- b) Energy transfer efficiency
- c) Sanitary examination of Water.
- d) Vertical Profiles.
- e) Algae toxins.
- f) Trickling filters.
- g) Biofouling.
- h) Deterioration of painted surfaces.

**UNIT-1:**

2. What are the different biological factors influencing the growth and survival of microorganisms? (15)

(Or)

Describe the interrelations of microbial populations and community dynamics.

**UNIT-2:**

3. Explain the Zonation characteristics of oceans. (15)

(Or)

What are the various water-borne diseases arising due to faecal pollution? Mention the indicator organisms.

**UNIT-3:**

4. Write short notes on the microbial production of  
(a) Methyl mercury. (b) Tri-methyl arsine (c) H<sub>2</sub>S (15)

(Or)

Explain the various processes involved in the treatment of sewage. Add a note on the significance of microorganisms.

**UNIT-4:**

5. Write about the role of microorganisms in the degradation of Oil spills and pesticides.

(Or)

Write about the microbiological deterioration of paper and textiles and their prevention.

**General Guidelines:**

1. Q<sub>1</sub> consists 2 short note questions should be given from each unit. 4 units X 2 = 8 short note questions carries each question 5 marks. 5 X 5 = 25 marks.
2. Q<sub>2</sub> to Q<sub>5</sub>, all are **essay type questions only**. No short type and long type answers. 2 essay type questions from each unit with internal choice. Q<sub>2</sub>, Q<sub>3</sub>, Q<sub>4</sub> and Q<sub>5</sub> covers the syllabi from units 1, 2, 3 and 4 respectively i.e. both the essay questions in Q<sub>2</sub> must be given from **unit-1**. Similarly Q<sub>3</sub> from **unit 2**, Q<sub>4</sub> from **unit 3** and Q<sub>5</sub> from **unit 4** respectively. Each essay question carries 15 marks (Q<sub>2</sub> to Q<sub>5</sub>) ⇒ 4 questions x 15 marks = 60 marks. Totally 25 + 60 = 85 marks.
3. **Examiners should strictly adhere these instructions.**  
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**MODEL QUESTION PAPER**

**M.Sc. Microbiology**

**4<sup>th</sup> Semester**

**PAPER-3: MB 403: FOOD MICROBIOLOGY AND AGRICULTURAL  
MICROBIOLOGY**

Time: 3 hrs.

Max. Marks: 85

Answer all questions

1. Write short notes on any **five** of the following: 5 X 5 = 25 marks.
- a) Microbial flora of fresh foods, meat & milk.
  - b) Types of Spoilage organisms
  - c) Refrigeration & freezing as food preservation techniques
  - d) Single cell protein.
  - e) Soil profile.
  - f) Biochelators.
  - g) Phosphate solubilization
  - h) NPV Virus

**UNIT-1:**

2. What is food poisoning? Discuss the mycotoxins and bacterial toxins in food & their impact on human health. (15)

(Or)

Enumerate different techniques involved in microbiological examination of foods.

**UNIT-2:**

3. Enumerate the methods of food preservation. (15)

(Or)

Discuss in detail the production of Biomass.

**UNIT-3:**

4. Describe the role of microorganisms in organic mater decomposition. (15)

(Or)

Explain the process of Biological Nitrogen fixation.

**UNIT-4:**

5. Discuss the different bio-fertilizers and add a note on their significance. (15)

(Or)

Discuss the role of Bio-pesticides in Biological control.

**General Guidelines:**

1. Q<sub>1</sub> consists 2 short note questions should be given from each unit. 4 units X 2 = 8 short note questions carries each question 5 marks. 5 X 5 = 25 marks.
2. Q<sub>2</sub> to Q<sub>5</sub>, all are **essay type questions only**. No short type and long type answers. 2 essay type questions from each unit with internal choice. Q<sub>2</sub>, Q<sub>3</sub>, Q<sub>4</sub> and Q<sub>5</sub> covers the syllabi from units 1, 2, 3 and 4 respectively i.e. both the essay questions in Q<sub>2</sub> must be given from **unit-1**. Similarly Q<sub>3</sub> from **unit 2**, Q<sub>4</sub> from **unit 3** and Q<sub>5</sub> from **unit 4** respectively. Each essay question carries 15 marks (Q<sub>2</sub> to Q<sub>5</sub>) ⇒ 4 questions x 15 marks = 60 marks. Totally 25 + 60 = 85 marks.
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**MODEL QUESTION PAPER**

**M.Sc. Microbiology**

**4<sup>th</sup> Semester**

**PAPER-4: MB 404: PHARMACEUTICAL MICROBIOLOGY**

Time: 3 hrs.

Max. Marks: 85

Answer all questions

1. Write short notes on any **five** of the following: 5 X 5 = 25 marks.
- a) Distinguish between Antiseptics & Disinfectants.
  - b) Aminoglycoside antibiotics.
  - c) Bacterial Cell wall.
  - d) Folate antagonists.
  - e) Microbial production of Vitamin B<sub>12</sub>.
  - f) Microbial transformation of steroids.
  - g) Microbial spoilage
  - h) Quality assurance.

**UNIT-1:**

2. Define antibiotics. Classify them with examples. (15)
- (Or)

Discuss about ~~to~~ lactam antibiotics quoting proper examples.

**UNIT-2:**

3. Write in detail about the Bacterial resistance to antibiotics. (15)
- (Or)

What is antibiotic assay? Write the assay of penicillin & streptomycin.

**UNIT-3:**

4. Write down the Industrial production of amylase and Citric Acid. (15)
- (Or)

What is microbial assay? Write the assay of Vitamin B<sub>12</sub> and Lysine.

**UNIT-4:**

5. Write a note on microorganisms that effect pharmaceutical industry and write down the measures to be taken to control microbial risk.

(15)

(Or)

Discuss in detail about contamination of non-sterile pharmaceuticals in hospital and community environments.

**General Guidelines:**

1. Q<sub>1</sub> consists 2 short note questions should be given from each unit. 4 units X 2 = 8 short note questions carries each question 5 marks. 5 X 5 = 25 marks.
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