S.S. Jain Subodh P.G. College, Jaipur (Autonomous)
M. Sc. Microbiology Semester II

Assignment March 2025
Paper-I
Bacteriology

Students are required to attempt 4 questions (one question from each unit). Write answers in at least 500 words with good presentation. Each question carries **7.5** marks.

UNIT-I

Q. 1 Explain in detail Bergey's Manual System of bacterial classifications. **7.5**

OR

Q. 2 Write detail note on Endospore structure and formation. **7.5**

UNIT-II

Q. 3 Explain in detail Phylogenetic diversity and key features of different phyla of Archaebacteria. **7.5**

OR

Q. 4 Write detailed account of methanogens and extremophiles. **7.5**

UNIT-III

Q.5 Explain in detail account of Anoxygenic photosynthetic bacteria. **7.5**

OR

Q.6 Explain in detail bioluminescent bacteria with example. **7.5**

UNIT-IV

Q. 7 What do you mean by microbial growth curve, explain in detail batch culture and continuous Culture. **7.5**

OR

Q. 8 Write detail note on economic importance of bacteria**.** **7.5**

S.S. Jain Subodh P.G. College, Jaipur (Autonomous)
M. Sc. Microbiology Semester II
Assignment March 2025
Paper-II
Molecular Biology and Microbial Genetics

Students are required to attempt 4 questions (one question from each unit). Write answers in at least 500 words with good presentation. Each question carries **7.5** marks.

UNIT-I

1. Explain the structure and different forms of DNA (A, B, C, D, T, and Z). **7.5**
2. Describe the process of DNA replication in prokaryotes. **7.5**

UNIT-II

3. Explain the mechanism of transcription in prokaryotes, including initiation, elongation, and termination. **7.5**
4. Discuss the process of translation and post translation modifications in eukaryotes. **7.5**

UNIT-III

5. Explain the regulation of gene expression in bacteria using Trp Operon as example. **7.5**
6. Describe different types of mutations and their molecular mechanisms at the DNA level. **7.5**

UNIT-IV

7. Explain bacterial transformation process and the role of competency in gene transfer. **7.5**
8. Discuss bacterial conjugation and the role of F and HFR factors in genetic recombination. **7.5**

S.S. Jain Subodh P.G. College, Jaipur (Autonomous)

M. Sc. Microbiology Semester II

Assignment March 2025

Paper-III

Microbial Ecology

Students are required to attempt 4 questions (one question from each unit). Write answers in at least 500 words with good presentation. Each question carries **7.5** marks.

UNIT-I

Q. 1. What is ecological succession? Give an account of the sequential stages of a typical xerosere. **7.5**

Or

Q. 2. Write notes on: **3+4.5 =7.5**

a. Microbial biofilms

b. Ecosystem characteristics

UNIT-II

Q3. Write notes on: **3+4.5 =7.5**

a. Mycorrrhiza.

b. Lichens.

Or

Q. 4. Describe the interactions of microbial population in detail. **7.5**

UNIT-III

Q.5. Write notes on: **3.5+4 =7.5**

a. Environmental impact of biogeochemical cycles.

b. Phosphorus cycle.

Or

Q. 6. What is Eutrophication? Write about the causes of eutrophication. And also mention the microbial changes in eutrophic bodies of water induced by various inorganic pollutants. **7.5**

UNIT-IV

Q7. Write a brief account of airborne transmission of microbes, their diseases and Preventive measures. **7.5**

Or

Q. 8. Write notes on: **3.5+4=7.5**

a. Aeroallergy and Aeroallergens

b. Factors affecting microbial community in soil.

M. Sc. Microbiology Semester II

Assignment March 2025

Paper- IV

Medical Microbiology

Students are required to attempt 4 questions (one question from each unit). Write answers in at least 500 words with good presentation. Each question carries **7.5** marks.

UNIT-I

Q1. Discuss Pathogenesis of Viral infections in detail. **(7.5)**

Or

Q2. Write short notes on following: **(4+3.5=7.5)**

a). Normal microbial flora of Intestinal Tract and their role

b). Antimicrobial host defence mechanisms

UNIT-II

Q3. Describe about general characteristic, morphology, pathogenicity, diagnosis and treatment of disease caused by *Mycobacteria*. **(7.5)**

Or

Q4. Write short notes on following: **(4+3.5=7.5)**

a). *Shigella*

b). *Pneumococci*

UNIT-III

Q5. Discuss the structure, reproduction, pathogenicity, diagnosis and treatment of disease caused *by Candida albicans*. **(7.5)**

Or

Q6. Write short notes on following: **(4+3.5=7.5)**

a). *Sporothrix schenckii*

b). *Aspergillus fumigatus*

UNIT-IV

Q7. Write a detailed note on pathogenesis, diagnosis, epidemiology and treatment of Pox Virus. **(7.5)**

Or

Q8. Write short note on following: **(4+3.5=7.5)**

a). HIV

b). Hepatitis B virus

M. Sc. Microbiology Semester IV

Assignment March 2025
Paper I
Immunology

Students are required to attempt 4 questions (one question from each unit). Write answers in at least 500 words with good presentation. Each question carries **7.5** marks.

UNIT-I

Q1. Explain Innate and adaptive immunity in detail. **(7.5)**

Or

Q2. Write short notes on following: **(4+3.5=7.5)**

a). Phases of Immune response

b). Hematopoises

UNIT-II

Q3. Discuss the production of polyclonal Antibodies and their applications. **(7.5)**

Or

Q4. Write short notes on following: **(4+3.5=7.5)**

a). Immuno electrophoresis

b). Western Blotting

UNIT-III

Q5. Write a detailed note on Major Histocompatibility Complex. **(7.5)**

Or

Q6. Write short notes on following: **(4+3.5=7.5)**

a). DNA Vaccines

b). Attenuated Vaccines

UNIT-IV

Q7. Describe in detail about Hypersensitivity, its types and associated diseases. **(7.5)**

Or

Q8. Write short note on following: **(4+3.5=7.5)**

a). Addison's disease

b). B Cell deficiencies

M.Sc. Microbiology Semester IV

Assignment March 2025

Paper II

Industrial Microbiology

Students are required to attempt 4 questions (one question from each unit). Write answers in at least 500 words with good presentation. Each question carries **7.5** marks.

UNIT-I

Q. 1 What do you mean by upstream process? Write detail note on strain improvement of industrial important microorganism. **7.5**

OR

Q. 2 Explain in brief media formulation for fermenter. **7.5**

UNIT-II

Q. 3 Explain in brief downstream process of microbial products and its applications applications. **7.5**

OR

Q. 4 Explain in brief various methods used in purification of microbial products. **7.5**

UNIT-III

Q. 5 Write detail note on industrial production of ethanol. **7.5**

OR

Q. 6. Explain in brief immobilization of microbial cell and enzyme and its applications. **7.5**

UNIT-IV

Q. 7 Write detail note on production of recombinant vaccine and its applications. **7.5**

OR

Q. 8 Write detail note on industrial applications of microorganism. **7.5**

S.S. Jain Subodh P.G. College, Jaipur (Autonomous)
M. Sc Microbiology Semester IV

Assignment March- 2025
Paper III Elective -A
Bioethics, Biosafety and IPR

Students are required to attempt 4 questions (one question from each unit). Write answers in at least 500 words with good presentation. Each question carries **7.5** marks.

UNIT -I

1. Write a detailed note on ELSI on Human Genome Project. **7.5**

OR

2. Write short note on the following: **7.5**

(a) Ethical Implications on Biological Weapons
(b) Ethical and moral values on experimental animals.

UNIT -II

3. Explain different levels of biosafety and give three specific microorganisms at each level. **7.5**

OR

4. Write short note on the following: **7.5**

(a) Cartagena Protocol on biosafety
(b) Biosafety cabinets and types

UNIT -III

5. Write a note on assessment and management risks associated with GMO. **7.5**

OR

6. Write short note on the following: **7.5**

(a) IPR and its importance with reference to India
(b) Role of regulatory bodies in biosafety committee

UNIT -IV

7. Write a detailed note on Intellectual Property Management. **7.5**

OR

8. Write short note on the following: **7.5**

(a) Methods of application of patents
(b) Forms of protection (Copyright, Industrial /design and Trademark)

S.S. Jain Subodh P.G. College, Jaipur (Autonomous)
M. Sc. Microbiology Semester IV

Assignment March 2025
Paper-IV Elective A
Enzymology and Fermentation Technology

Students are required to attempt 4 questions (one question from each unit). Write answers in at least 500 words with good presentation. Each question carries **7.5** marks.

UNIT-I

Q1. Define enzymes and explain their properties. Discuss the concepts of holoenzyme, apoenzyme, cofactors, coenzymes, and prosthetic groups with examples. **7.5**

OR

Q2. Describe allosteric enzymes and isoenzymes. How do enzyme inhibitors regulate enzyme activity. **7.5**

UNIT-II

Q3. Derive the Michaelis-Menten equation and explain its significance in enzyme kinetics. **7.5**

OR

Q4. Describe different methods of immobilization of enzymes? **7.5**

UNIT-III

Q5. Explain the history of fermentation and its significance. What are the key factors in microbial culture selection for fermentation? **7.5**

OR

Q6. Describe the working principles of different fermenters, including packed bed, fluidized bed, trickle bed, and bubble column reactors. **7.5**

UNIT-IV

Q7. Explain microbial growth kinetics in batch, continuous, and fed-batch cultures. What are their advantages and applications? **7.5**

OR

Q8. Discuss the production and applications of microbial products such as antibiotics (penicillin) and single-cell proteins (SCP). **7.5**