

**S.S. Jain Subodh P.G. College, Jaipur**  
**M.Sc. Biotechnology (II Semester) 2025**  
**Paper I (Molecular Biology)**  
**Assignment March 2025**

**Instructions for Students:** Assignment consists of 8 questions. Students are required to attempt **4 Questions** (1 from each unit). Write answers in atleast 500 words with good presentation. Each question carries **7.5 Marks**.

**UNIT-I**

**Q.1** Explain in detail DNA Repair system in prokaryotes with the help of diagrams.

**OR**

What is the end replication problem? Explain the role of telomerases in solving the problem.

**UNIT-II**

**Q.2.** Explain translation in prokaryotes with the help of well labelled diagrams.

**OR**

Explain eukaryotic transcription initiation and the role of mediators and enhancers.

**UNIT-III**

**Q.3.** Explain the intracellular protein trafficking with the help of diagrams.

**OR**

What are the factors influencing mRNA stability? How is it regulated?

**UNIT-IV**

**Q.4.** Describe Northern blotting technique in detail and give its applications.

**OR**

What is CRISPR/Cas9 system for gene editing? Why is this technique unique?

**S.S. JAIN SUBODH P.G. COLLEGE, JAIPUR**

**M.Sc. Biotechnology (Semester II)**

**Paper-II (Enzymology)**

**Assignment March 2025**

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 enzyme catalysis? Write detail note on various enzyme catalysis activity. 7.5

**OR**

**Q. 2** Explain in brief factors affecting on enzyme activity. 7.5

**UNIT-II**

**Q. 3** Explain allosteric enzyme? Describe in detail concerted and sequential models for allosteric enzyme. 7.5

**OR**

**Q. 4** Write detail note on reversible and irreversible enzyme inhibition. 7.5

**UNIT-III**

**Q. 5** What do you mean by enzyme kinetics, describe in brief enzyme kinetics and its applications. 7.5

**OR**

**Q. 6** Explain in brief Ribozymes and DNAzymes. 7.5

**UNIT-IV**

**Q. 7** Write detail note on various industrial applications of enzymes. 7.5

**OR**

**Q. 8** Write detail note on enzyme immobilization and its applications. 7.5

**S. S. JAIN SUBODH P. G. COLLEGE, JAIPUR (AUTONOMOUS)**  
**M.Sc. Biotechnology (Semester II)**  
**Paper-III (Immunology)**  
**Assignment March 2025**

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 the Antibodies Structure and their classes with detail diagram. (7.5)

**OR**

Q.2 Write short note on Organization and expression of immunoglobulin genes. (7.5)

**UNIT-II**

Q.3 Write a note on Cells of immune system. (7.5)

**OR**

Q.4 Explain the B cells maturation, activation and proliferation with diagram. (7.5)

**UNIT-III**

Q.5 Write the process for the Activation of complement system and their regulation with the help of diagram. (7.5)

**OR**

Q.6 Write short note on the following:

- (a) DAMS
- (b) PAMS

**UNIT-IV**

Q.7 Define hypersensitivity? Explain the various types of hypersensitive reactions. (7.5)

**OR**

Q.8 Write short note on Autoimmunity.

**S. S. JAIN SUBODH P. G. COLLEGE, JAIPUR (AUTONOMOUS)**  
**M.Sc. Biotechnology (Semester II)**  
**Elective Paper of Group B (Virology)**  
**Assignment March 2025**

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 Biosafety? Discuss various types of Biosafety levels and it's examples & guidelines for laboratories.

**OR**

Q.2 Write note on Bacteriophage virus and it's replication cycle.

**UNIT-II**

Q.3 What is ELISA? Write detail note on it's components, Principle, types and applications ?

**OR**

Q.4 Write note on Immunohistochemistry.

**UNIT-III**

Q.5 Write detail note about HIV virus and it's structure?

**OR**

Q.6 Write note on Virus cell interaction.

**UNIT-IV**

Q.7 Define epidemiology. Explain in detail functions of epidemiology in public health ?

**OR**

Q.8 Write note on Case control and cohort studies of any disease.

**S. S. JAIN SUBODH P. G. COLLEGE, JAIPUR (AUTONOMOUS)**  
**M.Sc. Biotechnology (Semester IV)**  
**Paper-I (Plant Biotechnology)**  
**Assignment March 2025**

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 Define Biotechnology ? Discuss modern trends in Plant Biotechnology.

**OR**

Write note on the Various techniques of plant cell and tissue culture.

**UNIT-II**

Q.3 Define Totipotency ? Write detail note on Micropropagation with diagram?

**OR**

Q.4 Write note on Production of haploids.

**UNIT-III**

Q.5 Define Transformation. Write detail note about Agrobacterium mediated plant transformation.

**OR**

Q.6 Write note on Particle Gun Method.

**UNIT-IV**

Q.7 Define Molecular farming. Explain in detail benefits and risks of Molecular farming ?

**OR**

Q.8 Write note on Herbicide resistance.

**S.S. Jain Subodh P.G. College, Jaipur**  
**M.Sc. Biotechnology (IV Semester) 2025**  
**Paper II (IPR and Bioethics)**  
**Assignment March 2025**

**Instructions for Students:** Assignment consists of 8 questions. Students are required to attempt **4 Questions** (1 from each unit). Write answers in atleast 500 words with good presentation. Each question carries **7.5 Marks**.

**UNIT-I**

**Q.1** Discuss in detail national and international guidelines for biosafety regulation.

**OR**

Write a detailed note on legal and socioeconomic impact of biotechnology.

**UNIT-II**

**Q.2.** What is meant by Intellectual property rights (IPR). Explain types of IPR.

**OR**

You have a business idea of superfood products such as algae-based supplement. Discuss the steps that are required to set up your business based on this business idea.

**UNIT-III**

**Q.3.** A biotechnology firm reports a revenue of ₹15,00,000 and a Cost of Goods Sold (COGS) of ₹6,00,000. Calculate the Gross Profit Margin and explain its significance in assessing the company's financial health.

**OR**

Explain in detail different stages of setting up an enterprise in field of biotechnology.

**UNIT-IV**

**Q.4.** Write detailed notes on Bio-incubators and bio accelerators.

**OR**

What is plagiarism? Explain the methods for prevention and management of plagiarism.

**S. S. JAIN SUBODH P. G. COLLEGE, JAIPUR (AUTONOMOUS)**  
**M.Sc. Biotechnology (Semester IV)**  
**Paper-III (Applied Environmental Biotechnology)**  
**Assignment March 2025**

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 the historical development and applications of Environmental Biotechnology.  
7.5

**OR**

Write short note on Microbial interactions (symbiosis, competition, predation) 7.5

**UNIT-II**

Q.2 Describe the different waste types and sources with examples. 7.5

**OR**

Write short note on anaerobic digestion and composting 7.5

**UNIT-III**

Q.3 Explain biomass production systems and sustainability in bioenergy. 7.5

**OR**

Write short note on Nutrient recovery technologies (nitrogen, phosphorus) 7.5

**UNIT-IV**

Q.4 Discuss the importance and methodology of Environmental Impact Assessment (EIA).  
7.5

**OR**

Write note on Sustainable Development Goals (SDGs) and their relevance to biotechnology.  
7.5

**S. S. JAIN SUBODH P. G. COLLEGE, JAIPUR (AUTONOMOUS)**  
**M.Sc. Biotechnology (Semester IV)**  
**Paper-IV (Bioprocessing & Engineering)**  
**Assignment March 2025**

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 Define Bioprocessing? How to analyze mixed microbial populations. 7.5

**OR**

Q.2 Write short note on the following: 7.5

(a) Membrane Bioreactors

**UNIT-II**

Q.3 Define downstream processing? Write detail note on removal of microbial cells and solid matter, foam reparation, precipitation, filtration, centrifugation, cell disruptions. 7.5

**OR**

Q.4 Write short note on the following: 7.5

(a) Whole cell Immobilization

**UNIT-III**

Q.5 Write the process for ethanol and citric acid production with diagram. 7.5

**OR**

Q.6 Write short note on the following: 7.5

(a) Production of Single Cell Protein

**UNIT-IV**

Q.7 Define Cell growth. Write an essay on Substrate Assimilation/Product Secretion? 7.5

**OR**

Q.8 Write short note on the following: 7.5

(a) Production of steroids, vaccines