S.S. Jain Subodh P.G. College, Jaipur (Autonomous)
CIA March 2026
M.Sc. Biotechnology Semester II
Paper I- Molecular Biology

Max. Marks: 30

UNIT-I

Q.1 Describe the initiation and complete mechanism of DNA replication in prokaryotes with the help of neat, labelled diagrams.

OR

Write short notes on:

a. End replication problem and role of telomerase in eukaryotes
b. Site specific recombination

UNIT-II

Q.2. Explain transcription initiation in eukaryotes emphasizing on the role of RNA polymerases, mediators and enhancers.

OR

Write short notes on:

a. Splicing pathways and Alternative splicing
b. Lac, trp and ara operons

UNIT-III

Q.3. Explain in detail the regulation of gene expression in eukaryotes with the help of suitable diagrams.

OR

Write short notes on:

a. Co- and post translational modifications of proteins
b. Protein targeting

UNIT-IV

Q.4. Explain the different types of blotting techniques used in molecular biology with well labelled diagrams.

OR

Write short notes on the following

a. Genome editing
b. Promoter bashing

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

Assignment March 2026
Paper-II
Enzymology

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 Write short notes on:- COVALENT CATALYSIS. (7.5)

OR

Q.2 How enzyme activity can be measured?

UNIT -II

Q. 3 Explain irreversible inhibition of enzyme. (7.5)

OR

Q.4 Write short note on competitive and uncompetitive inhibition. (7.5)

UNIT -III

Q. 5 Write short note of Ribozymes. (7.5)

OR

Q.6 Explain multisubstrate enzyme kinetics. (7.5)

UNIT -IV

Q. 7 What do you mean by enzyme immobilization explain. (7.5)

OR

Q.8 Describe the industrial uses of enzymes. (7.5)

S. S. JAIN SUBODH P. G. COLLEGE, JAIPUR (AUTONOMOUS)
M.Sc. Biotechnology (Semester II)
Paper-III (Immunology)
Assignment March 2026

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 MHC Structure and their classes with detail diagram. (7.5)

OR

Q.2 Write short note on different types of immunoglobulin and their function. (7.5)

UNIT-II

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

OR

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

UNIT-III

Q.5 Write the process of role of T_H cells in humoral response (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 Antibody Drug Conjugate (ADC).

S. S. JAIN SUBODH P. G. COLLEGE, JAIPUR (AUTONOMOUS)
M.Sc. Biotechnology (Semester II)
Assignment
Paper IV (Elective Paper of Group B (Virology)
Attempt any four questions

UNIT-I

Q.1 Define Virus? Discuss introduction to replication strategies in viruses.

OR

Write short note on the following:

(a) Containment facilities
(b) Virus taxonomy

UNIT-II

Q.2 What is PCR? Write detail note on it's components, Principle, types and applications ?

OR

Write short note on the following:

(a) *in vitro* and *in vivo* systems for virus growth
(b) IFA

UNIT-III

Q.3 Write detail note about Herpes virus and it's structure?

OR

Write short note on the following:

(a) Clathrin coated pits
(b) Virus- cytoskeletal interactions

UNIT-IV

Q.4 Define epidemiology. Explain in detail types and methods of public health and infectious disease surveillance ?

OR

Write short note on the following:

(a) Cohort studies
(b) Needs and steps to be taken for outbreak investigations.

S. S. JAIN SUBODH P. G. COLLEGE, JAIPUR (AUTONOMOUS)
M.Sc. Biotechnology (Semester IV)
Assignment
Paper-I (Plant Biotechnology)
Attempt any four questions

UNIT-I

Q.1 Define Biotechnology ? Discuss various application and development of Plant Biotechnology.

OR

Q.2 Write short note on the following:

(a) Stock Solutions
(b) Plant Growth Regulators

UNIT-II

Q.3 Define Totipotency ? Write detail note on Organogenesis and Somatic embryogenesis with diagram?

OR

Q.4 Write short note on the following:

(a) Somaclonal variation in plant cell culture and regenerated plants
(b) Protoplast culture

UNIT-III

Q.5 Define Transformation ? Write detail note about direct transformation of plant systems using physical methods.

OR

Q.6 Write short note on the following:

(a) Chemical methods of gene transfer
(b) Comparison of methods for transfer of DNA to plants

UNIT-IV

Q.7 Define Cry Proteins. Explain in detail about Insect resistance ?

OR

Q.8 Write short note on the following:

(a) Molecular farming
(b) Metabolic engineering

S.S. Jain Subodh P.G. College, Jaipur (Autonomous)
Assignment March 2026
M.Sc. Biotechnology Semester IV
Paper II- IPR and Bioethics

Max. Marks: 30

UNIT-I

Q.1 Discuss in detail the legal and socio-economic impact of biotechnology.

OR

Explain different levels of containment with suitable examples.

UNIT-II

Q.2. 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.

OR

Explain different types of Intellectual Property Rights in detail with suitable examples.

UNIT-III

Q.3. Explain in detail different stages of setting up an enterprise in field of biotechnology.

OR

Discuss in detail the 4P marketing strategies for an enterprise.

UNIT-IV

Q.4. Write detailed note on role of bioethics in research. Discuss all the aspects.

OR

Write short notes the ways of prevention and management of plagiarism

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

Assignment March 2026
Paper-III
Environmental biotechnology

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 microbial interaction including symbiosis, competition and predation. **7.5**

Q. 2 Write short notes on - **(3.5+4=7.5)**

a) Scope of environmental biotechnology
b) Application of environmental biotechnology

UNIT -II

Q. 3 Explain E- waste and its environmental impact in detail. **7.5**

Q. 4 Write short notes on - **(3.5+4=7.5)**

a) Membrane bioreactors
b) Municipal and agricultural waste

UNIT -III

Q. 5 Discuss briefly different types of biomass in environment. **7.5**

Q. 6 Write short notes on - **(3.5+4=7.5)**

a) Nutrient recovery technology
b) Circular economy concept

UNIT -IV

Q. 7 Explain in detail the microbial indicators of pollution. **7.5**

Q. 8 Write short notes on - **(3+4.5=7.5)**

a) Sustainable development goals
b) Remote sensing and GIS in environmental monitoring

S. S. JAIN SUBODH P. G. COLLEGE, JAIPUR (AUTONOMOUS)
M.Sc. Biotechnology (Semester IV)
Paper-IV (Bioprocessing & Engineering)
Assignment March 2026

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) Photobioreactor

UNIT-II

Q.3 Define downstream processing? Write detail note on bioconversion and Biotransformation. 7.5

OR

Q.4 Write short note on the following: 7.5

Whole cellImmobilization and their Industrial Applications

UNIT-III

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

OR

Q.6 Write short note on the following: 7.5

Agro-products (oilseeds) Food preservation.

UNIT-IV

Q.7 Define cell growth. Write an assay on Surface and submerged liquid substrate fermentation.? 7.5

OR

Q.8 Write short note on the following: 7.5

Industrial Enzymes