University of Rajasthan
Jaipur

SYLLABUS

M. Sc. BIO-CHEMISTRY

(Annual Scheme)

M.Sc. (Previous) Examination 2019
M.Sc. (Final) Examination 2020
M.SC. BIOCHEMISTRY

Course Outline and Scheme of Examination for
(Two Year Course-Annual System)
Jaipur- 302 004
University of Rajasthan

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>S.1</td>
<td>Computational Methods</td>
</tr>
<tr>
<td>1</td>
<td>Biochemical Techniques and Enzyme倫ogy and Bioenergetics</td>
</tr>
<tr>
<td>3</td>
<td>Genetic Biochemistry</td>
</tr>
<tr>
<td>3</td>
<td>General Metabolism</td>
</tr>
<tr>
<td>3</td>
<td>Biochemistry of Molecules</td>
</tr>
<tr>
<td>3</td>
<td>Cell Biology and Physiology</td>
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<td>Exam.</td>
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Max. Hours of Paper: 6

Date: 4-11-2014
M.S. BIOCHEMISTRY

(II YEAR COURSE-ANNUAL SYSTEM)

JAPIUR- 32 004

UNIVERSITY OF RAJASTHAN
UNIT I: STRUCTURE AND FUNCTION OF PROTEINS AND MACROMOLECULES

UNIT II: TRANSPORT MECHANISMS

UNIT III: BİOMEMBRANES
UNIT II - ENZYME KINETICS


UNIT I - BIOCATALYTICS

UNIT IV - ENZYMOCHEMISTRY AND BIOTECHNOLOGIES

UNIT II - CARBOHYDRATE METABOLISM

UNIT III - LIPID METABOLISM

UNIT I - AMINO ACID AND NUCLEOTIDE METABOLISM

UNIT IV - LIPID METABOLISM

UNIT V - BIOCHEMISTRY OF DNA AND RNA
1. Basic Biochemical Methods

LAB COURSE I


Syllabus: MSc Biochemistry

UNIT II: METABOLIC TECHNIQUES

UNIT IV: DNA REPLICATION-I

Semi-conservative replication, Replication forks, Role of DNA primers, Telomerase enzyme, Replication of DNA in E.coli, Recombinant DNA technology, DNA sequencing, DNA fingerprinting.

UNIT IV: DNA REPLICATION-II AND REPAIR

DNA repair mechanisms, DNA ligases, DNA polymerases, DNA replication errors, DNA repair mechanisms, DNA repair enzymes, DNA repair processes, DNA repair mechanisms.

UNIT IV: RNA SYNTHESIS AND REGULATION

Transcription factors, RNA polymerases, RNA splicing, RNA editing, RNA modification, RNA stability.

UNIT V: PROTEIN TARGETING

G-PIPS, G-protein coupled receptors, Protein trafficking, Protein sorting and targeting, Cell organelles and proteins in the secretory pathway.

UNIT V: SIGNAL TRANSDUCTION


UNIT VI: IMMUNOBIOLOGY

Antibody structure, Antibody function, Immune response, Immune tolerance, Immune memory.

UNIT VII: GENETICS AND GENOMICS

Genetic principles, Genetic linkage, Genetic mapping, Genomic technologies, Genomic analyses.

UNIT VIII: MOLECULAR BIOLOGY

DNA structure, RNA structure, Protein structure, Protein synthesis, Protein folding.

UNIT IX: CELL BIOLOGY

Cell structure, Cell function, Cell signaling, Cell division, Cell death.

UNIT X: DEVELOPMENTAL BIOLOGY

Developmental processes, Developmental genetics, Developmental regulation, Developmental mechanisms.

UNIT XI: NEURAL BIOLOGY

Neuronal function, Neurotransmission, Neural plasticity, Neural development.

UNIT XII: MAMMALIAN BIOLOGY

Mammalian physiology, Mammalian genetics, Mammalian diseases, Mammalian evolution.

The genetic code, Elucidation, experimental, codon degeneracy, RNA structures, DNA structures, protein structures, folding, function, turnover, degradation, death, and mechanisms involved therein.
CANDIDATES HAVE TO ANSWER THE QUESTIONS ONE FROM EACH UNIT UNTIL THE QUESTIONS WILL BE SET IN ALL SELECTING TWO QUESTIONS FROM EACH.

TIME: 3 HRS
MAX. MARKS FOR EACH THEORY PAPER IS 100
INSTRUCTIONS TO EXAMINERS TO EACH PAPER (PREVIOUS AND FINAL)

MSc. BIOCHEMISTRY

1. PROTEIN ANALYSIS
   - Effect of inhibitors on oxygen consumption by purified enzyme
   - Study of effect of leucine on enzyme activities
   - Preparation and characterization of membrane proteins

2. PROTEIN SYNTHESIS
   - Identification of proteins by SDS-PAGE and amino acid analysis
   - Determination of amino acid content in proteins
   - Determination of protein concentration in solutions

3. NUCLEIC ACIDS AND ENZYMES
   - Analysis of DNA by gel electrophoresis
   - Detection of DNA by northern blotting
   - Detection of RNA by southern blotting

4. PROTECTIVE AND IMMUNOLOGY
   - Immune response to antigens
   - Determination of antibody levels
   - Detection of antigen-antibody complexes

5. INTESTINAL KINETICS AND METABOLISM
   - Study of intestinal absorption of nutrients
   - Analysis of intestinal motility
   - Determination of intestinal pH and enzymes

6. ANALYSIS OF BIOMOLECULES
   - Determination of molecular weight
   - Detection of protein-protein interactions
   - Analysis of protein-protein complexes

7. PROHODOERGINS AND NEUROTRANSMITTERS
   - Identification of neurotransmitters
   - Determination of neurotransmitter levels
   - Analysis of neurotransmitter receptors

8. GENE REGULATION AND HUMAN DISEASE
   - Analysis of gene expression
   - Determination of gene expression levels
   - Analysis of gene expression patterns

University of Rajasthan
M.Sc. BIOCHEMISTRY
(Previous and Final)

Max. Marks : 200

Duration of Exam : 12 hrs.
(Spread in 2 days)

4 Exercises to be performed selecting one exercise from each section.

Two quantitative exercises  = 50 \times 2 = 100
Two qualitative exercises  = 25 \times 2 = 50
Viva
Record

= 20

= 200

Note—The practical examination will be conducted by the board of two external and one internal examiners who will conduct practical on both days.

Dy. Registrar
(Academic)
University of Rajasthan
JAIPUR