



**SCHOOL of STUDIES in LIFE SCIENCE**

**Pt. Ravishankar Shukla University Raipur  
(C.G.), India 492010**

**Syllabus**

**Entrance Test**

**For**

**Ph. D. in BIOCHEMISTRY**

**Session: 2025-26**

Approved by:	Board of Studies Biochemistry	
Date: 23.5.2025	Dr. Mrigendra Kumar Dwivedi	
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	Prof. D. L. Gupta	
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## Syllabus for Ph. D. Entrance Test in BIOCHEMISTRY

### 1. Basic (Organic) Biochemistry

- I. **Biomolecules** – Structure and Biological role of Carbohydrates, Lipids, proteins and nucleic acids.
- II. **Bioenergetics and Metabolism**- Glycolysis, Krebs cycle, Pentose phosphate pathway, Beta Oxidation of free fatty acids, Fatty acid synthesis, Ketone bodies, Biosynthesis and degradation of Nucleic acids and amino acids. Inborn error in metabolic pathways.
- III. **Cell biology**- Transport of proteins among different organelles. Cell signaling: Signaling via G-protein linked and enzyme linked cell surface receptors, MAP kinase pathways. Eukaryotic cell division cycle
- IV. **Nutritional and clinical Biochemistry**- Nutritional aspects of the carbohydrates, lipids and protein. Composition of balanced diets. RDA , Food processing, BMR.  
Plasma proteins, Liver, Kidney function tests, Compensatory mechanism for acidosis and alkalosis. Malabsorption syndrome – tests for their evaluation and significance.
- V. **Plant and Animal Biochemistry**- Plant hormones, Photosynthesis, Senescence. Plant tissue culture, Plant transformation technology, RAPD. Seed technology. Animal Hormones, Genetic Engineering and Recombinant DNA technology.
- VI. **Gene replication, expression and regulation**- Replication in prokaryotes and Eukaryotes. Gene expression and regulation in prokaryotes and Eukaryotes.
- VII. **Basic Immunology**- Cells and organs of immune system, antigens, antibody, cytokines, MHC, Immune responses. Cancer.


### 2. Physical Biochemistry

- I. **Instrumentation and Molecular Techniques**- General Principle, Instrumentation and biological application of Chromatography, Electrophoresis, Centrifugation, Spectroscopy, Immunological Techniques, PCR, DNA and protein sequencing, Molecular Markers for diversity analysis.
- II. **Biostatistics**- Sampling, central tendency, Hypothesis and its testing.

### 3. in-organic Biochemistry

- I. Biological Role of Fe, Ca, Mg, Co, Zn, N and P.
- II. Iron Storage and Transport.
- III. Electron Carrier, Blue Copper protein, Co factors.

**BoS Biochemistry Approved Syllabus for Ph. D. Entrance Test in Biochemistry  
(Session 2025-26)**

 Padayship