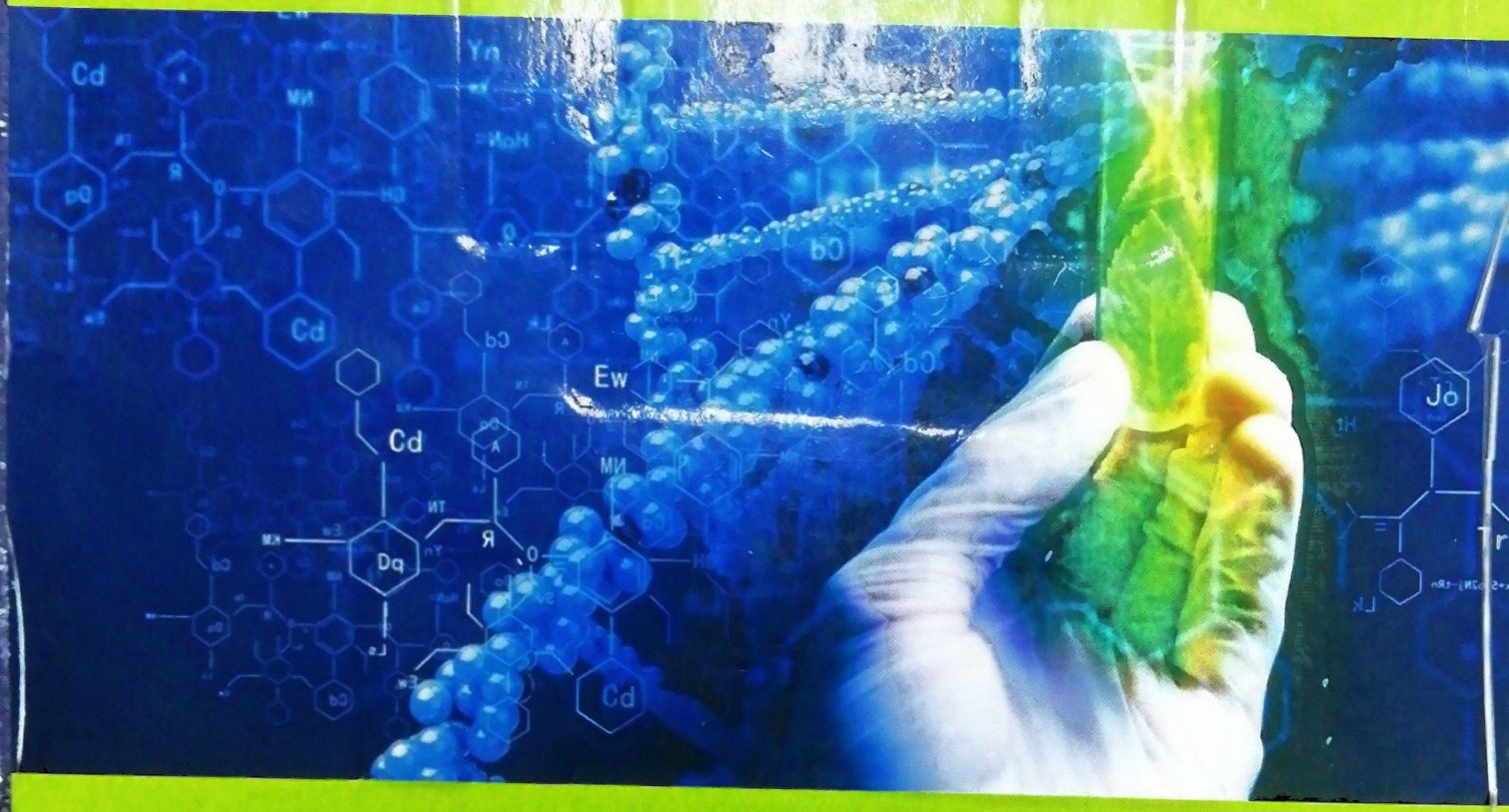
Based on syllabus of recognized universities

Textbook of

BIOTECHNOLOGY

For B.Sc Biotechnology - First Year



Including practicals and previous year questions

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BIOTECHNOLOGY

For B.Sc. First Year

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Ms. Rachana Tiwari: Joined as Assistant Professor in Faculty of Biotechnology, at Rungta College of Science and Technology, Bhilai. She completed her BSc(Biotechnology) from Shri Shankaracharya College, Bhilai and MSc (Biotechnology) in the year 2014 from Kalyan P.G Autonomous College, Bhilai, Chhattisgarh. She has a total of 06 years of teaching and research experience. She has been a part of many national and international conferences. She has published one research paper on the activity of Antioxidants in a very reputed journal and is currently working on an ongoing chapter writing project in Elsevier. Her area of interest is in the field of Antioxidant and Anti- drug Approach

Preface

It gives immense pleasure to publish the book on Biotechnology as well as for the students of all the subjects of Life Sciences. The objective of this book is to provide whole syllabus in one book with concise, compact and advanced reading materials in the students of Biotechnology Undergraduates. In order to make this Book very effective or useful because of including of Biotechnology Paper 1 and 2, Biotechnology Practical's and question bank in sufficient numbers.

This book containing all the units of Paper 1 and 2 of Biotechnology including the topic of Biochemistry, Biostatistics, Microbiology, Cell Biology, Genetics, Computers with an introduction to the Scope of Biochemistry, Biotechnology and Microbiology in career. In Last parts of the books containing Biotechnology Instrumentation and related Practical in easiest form.

The Subject Matter of this book is presented in simple understandable language so that the students will be grasp more and more. All the necessary parameters have been taken to make the book self-explanatory with full illustrations. The suitable diagrams, charts, table are given wherever necessary. The book is primarily written and essentially meant for undergraduate students of Biotechnology, but we anticipate that the content may be useful for wide range of students in life Sciences.

I would like to acknowledge the invaluable contributions provided by the Probecell editorial team. I give great thanks to the graphic designers who were instrumental in preparing much of the artwork for this text. I would also like to acknowledge my colleagues and students for their willingness to serve as test subjects for many of the useful contents in this book. Finally, I would like to thank my teachers and parents for their guidance, support, and encouragement throughout the process of completing this book.

We must express thankful to our colleagues and friends who support us and gives their expert advice. The authors will be highly obliged for any type of Suggestions to improve the content are welcome from the teachers and students

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BIOTECHNOLOGY

B.Sc. Part I

Index Paper – 1

BIOCHEMISTRY, BIOSTATISTICS AND COMPUTERS

BIOTECHNOLOGY

B.Sc. Part I

Index Paper – 2

CELL BIOLOGY, GENETICS AND MICROBIOLOGY

Practical's

S.No	Title
1	An introduction to Biotechnology, General rules for writing good lab notebooks aseptic technique and safety
2	Basic Requirements in a Laboratory:
3	Instruments used in Biotechnology laboratories
4	To perform different method of sterilization of glassware used in lab.
5	Preparation of basic liquid media (broth) for the routine cultivation of bacteria.
6	Preparation of basic solid media, agar slants and agar deep tubes for the routine cultivation of microorganisms.
7	Demonstration of selective and differential media.
8	Isolation and enumeration of micro-organisms from soil by the serial-dilution agar plating.
9	Isolation of microorganisms from air.
10	Preparation of bacterial smear.
11	Calibration of an ocular micrometer for different objective (low- power, high power and oil- immersion) of a microscope.
12	Measurement of micro- organisms by the use of ocular micrometer.
13	Enumeration (counting) of bacteria by plate count or serial dilution agar plate technique.
14	Pour- plate method.
15	Streak- plate method.
16	Spread – plate technique.
17	Broth culture cultivation.
18	Determination of bacterial growth curve by turbidity measurements (spectrophotometer method).
19	To study and demonstrate mitosis by preparing the mount of an onion root tip cells
20	To perform the Gram staining of given bacterial sample.
21	To determine the ability of an organism to hydrolyze starch or to produce alpha amylase.
22	Ninhydrin test is a chemical test performed to detect the presence of protein, ammonia, primary/secondary amines, or amino acids.
23	Xanthoproteic test for aromatic amino acid estimation.
24	Biuret test for protein estimation.
25	Millions test for phenolic group of protein

26	Molisch's test for carbohydrates.
27	To determine the presence or absence of reducing sugar in the solution by benedict test
28	Problems on mean, mode and median.