Second Edition

Biochemistry and Clinical Pathology

Practical Notebook Course Code ER20-23P

for Second Year Diploma in Pharmacy

has been written and designed as per the Pharmacy Council of India's Education Regulation, 2020, for Diploma in Pharmacy course (Course Code ER20-23P). This practical notebook, is designed to fulfil the course objectives and also help the pharmacy students in determination of the normal and abnormal constituents in blood and urine samples, and interpret the results of such laboratory tests.

The Notebook contains 24 experiments as per guidelines of ER-2020. Some blank left hand-sided pages have been provided for making observations and calculations wherever required as also for labelling and recording other important information on the subjects.

Appendix, which contains the list of manufacturers and suppliers of medical diagnostic equipment, reagents and kits, and assignment formats as per ER20-23P to be submitted by each student, has been added in the last to help the students as well as the teachers for conducting the practical | experiments.

Varun Dutt Sharma MPharm
is ex-Principal, Janta Polytechnic, Jahangirabad, Bulandshahar, UP, and currently Consultant at VYDSAM Ayurveda PG College, Khurja, UP.

SK Pandey BPharm
is ex-Head, Department of Pharmacy, Janta Polytechnic, Jahangirabad, Bulandshahar, UP.

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4819/XI, Prahlad Street, 24 Ansari Road, Daryaganj, New Delhi 110 002, India
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Sharma | Pandey

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Varun Dutt Sharma MPharm

Ex-Principal
Janta Polytechnic, Jahangirabad, Bulandshahar, Uttar Pradesh
Consultant, VYDSAM Ayurveda PG College, Khurja (UP)

SK Pandey BPharm

Ex-Head, Department of Pharmacy
Janta Polytechnic, Jahangirabad, Bulandshahar, Uttar Pradesh

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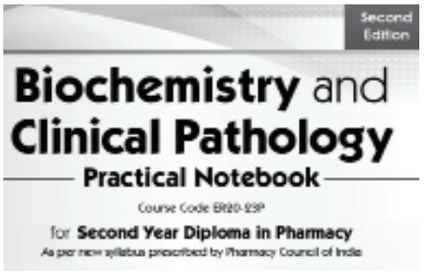

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Ph: 011-23289259, 23266861, 23266867 Fax: 011-23243014 Website: www.cbspd.com
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Corporate Office: 204 FIE, Industrial Area, Patparganj, Delhi 110 092, India

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Certificate

Student's Name: _____

Class: _____ *Roll No.* _____

Subject: _____

This is to certify that experiments, written in the index, have been performed by the student, are satisfactory.

Grade..... *Name and signature of Teacher*

College stamp *Date .....*

to

our Parents

Syllabus

Biochemistry and Clinical Pathology—Practical

Course Code: ER20-23P **50 Hours (2 Hours/week)**

Scope: This course is designed to train the students in the qualitative testing of various biomolecules and testing of biological samples for determination of normal and abnormal constituents.

Course Objectives: This course will train and provide hands-on experiences on the following:

1. Qualitative determination of biomolecules/metabolites in simulated biological samples
2. Determination of normal and abnormal constituents of simulated blood and urine samples

Course Outcomes: Upon successful completion of this course, the students will be able to:

1. Qualitatively determine the biomolecules/metabolites in the given biological samples
2. Determine the normal and abnormal constituents in blood and urine samples and interpret the results of such testing.

Practicals

1. Qualitative analysis of carbohydrates (4 experiments)
2. Qualitative analysis of proteins and amino acids (4 experiments)
3. Qualitative analysis of lipids (2 experiments)
4. Qualitative analysis of urine for normal and abnormal constituents (4 experiments)
5. Determination of constituents of urine (glucose, creatinine, chlorides) (2 experiments)
6. Determination of constituents of blood/serum (simulated) (creatine, glucose, cholesterol, calcium, urea, SGOT/SGPT) (5 experiments)
7. Study the hydrolysis of starch from acid and salivary amylase enzyme (1 experiment)

Assignments

The students shall be asked to submit written assignments on various pathology lab reports (one assignment per student per sessional period, i.e. a minimum of THREE assignments per student)

Instructions

1. In the laboratory student must be in uniform and should maintain strict discipline.
2. Always put on neat and clean white apron whenever you are working in laboratory.
3. Always bring practical notebook for viva and counter signature.
4. The practical notebook should be completed same day in every respect and should be submitted on the same day to the teacher concerned for the marking and signature.
5. Procedures are written in the language of students and procedure written should be strictly followed.
6. Actual observations and readings should be recorded in the practical notebook; calculations and conclusions should be based on the actual observations.
7. Practical must be performed individually.
8. Safety rules must be followed strictly and student must know emergency treatment for accidents, laboratory infections, etc.
9. Keep your working place neat and clean.
10. Student must handle equipment, glassware and appliances carefully. Thoroughly clean the apparatus required in the practical work.
11. After the work is finished, the student should clean the apparatus and other articles.
12. Never take or use any chemical or reagents without the prior permission of teacher or lab technician.
13. The physiological solution and working solution of drug should be prepared freshly at the time of conducting experiment.
14. The stock solution of the drugs can be stored under conditions specified individually.
15. Do not weigh less than 10 mg on a high quality analytical balance. For less than 10 mg of weighing of the any drug; it is advisable to prepare its solution by dilution method.
16. Never throw waste papers and burnt matchsticks in the sink; this will block the sink that may lead to overflowing. Put the waste materials in the dustbin.
17. The water taps and gas taps should be tightly closed after the work is over.
18. Electrical switches should be put off before leaving the laboratory.

Preface to the Second Edition

The Pharmacy Council of India made regulations under Section 10 of Pharmacy Act, 1948 called "The Education Regulations, 2020, for Diploma in Pharmacy course. "It was approved by Government of India, Ministry of Health and Family Welfare which was notified in october, 2020 and implemented in 2021 for Diploma in Pharmacy students. In ER, 2020, lots of scope has been given in this practical curriculum for the active learning by the students through the assignments which will enhance their critical thinking, searching scientific literatures, interpretational and communication skills. The designed practical course provides opportunities to observe, think, and analyse problem-solving methods in the given experimental/ simulated conditions. The designed course provides course objectives and also determination of the normal and abnormal constituents in blood and urine samples and interpret the results of such testing.

The *Practical Notebook* contains 24 experiments as per guidelines of ER, 2020. Some left blank pages are provided for making observations and calculations wherever applicable.

We shall gratefully acknowledge the comments, suggestions and criticism by respected teachers and students for improvement of future edition.

We express sincere thanks to Mr Satish Kumar Jain, Chairman & Managing Director, and Mr YN Arjuna, Vice President—Publishing, Editorial, and Publicity, CBS Publishers & Distributors for their cooperation, encouragement and assistance in bringing out the Second Edition of this *Practical Notebook*. Finally our gratitude to our colleagues for their inspiration and motivation.

Varun Dutt Sharma
SK Pandeyt

Preface to the First Edition

The ultimate objective of technical education is to develop relevant skills, creativity and competence among the students so as to enable them to perform the task effectively and efficiently later in the world of work. Practical work consists of tasks that require some manipulation of apparatus or some action.

To achieve the above aim and to reduce the writing workload to some extent for the students, this *Practical Notebook of Biochemistry and Clinical Pathology* for first year diploma in pharmacy has been written according to the new syllabus prescribed by the Pharmacy Council of lndia, Education Regulations, 1991. This practical notebook contains 44 (printed) and 3 (blank exercises) experiments, well illustrated with observation tables and normal clinical values to make more meaningful and serve as a guide to the students. A few blank exercises are provided so that student can use these pages for writing additional experiments guided by the teachers depending on the availability of reagents and infrastructure of the concerned laboratory.

We express sincere thanks to Mr Satish Kumar Jain, Chairman & Managing Director, and Mr YN Arjuna, Vice President—Publishing, Editorial, and Publicity, CBS Publishers & Distributors, New Delhi, for their cooperation, encouragement and assistance in bringing out this Notebook in its present form. Finally our gratitude to our colleagues and Mr Sandeep Kumar for his sincere cooperation in computer typing and setting the script.

We shall gratefully acknowledge the comments, suggestions and criticism by the teachers and students for improvement of future editions of this book.

Varun Dutt Sharma
SK Pandey

Contents

INDEX

S. No.	Name of the experiment	Page No.	Remarks

INDEX

S. No.	Name of the experiment	Page No.	Remarks

INDEX

S. No.	Name of the experiment	Page No.	Remarks

INDEX

S. No.	Name of the experiment	Page No.	Remarks