

Pharmacology

Course Code: **ER20-21T**

for **Second Year Diploma in Pharmacy**

is strictly written according to the new syllabus framed by Pharmacy Council of India (PCI) as per ER-2020. This book is presented and published to meet the requirements of students of second year Diploma in Pharmacy (DPharm). The book, written in a simple and lucid language, attempts to demystify and simplify the basic concepts for the students of pharmacy for proper understanding of the subject and to get a sure success in the State Board Examinations.

Salient features of the book:

- All topics are described in an easy to understand language.
- Gives to-the-point answers.
- Covers all the requisite contents as per new syllabus.
- Shows success key in Board Examination.

This book, as well as **CBS Confident Pharmacy Series**, will be useful not only for the students and teachers but also for candidates desiring to attempt competitive examinations for job opportunities in pharmacy profession such as hospital pharmacists in PHCs, civil hospitals, etc.

VN Raje MPharm is currently Principal, Gourishankar Education Society's GES College of Pharmacy (DPharm), Limb, Satara, Maharashtra. He has an excellent track record in pharmacy academics with 31 years of rich experience as a teacher and principal at diploma in pharmacy institution. He is presenting personality development and career guidance programmes to the students and staff.



He is recipient of 'Best Participation Award' at national level IAPST conference held in 2011. Since 2008, he has been writing books in the field of pharmacy: So far he has published 11 popular titles, each title going to the third edition.

Now, as per PCI's new syllabus (ER-2020), he is in the process of completing fourth edition of 6 titles and bringing out fresh edition of 5 new titles according to the recent subjects introduced in the syllabus.



Scan for
price of this
book and
catalogue

ISBN: 978-93-5466-502-8



Pharmacology

Pharmacology

Course Code: **ER20-21T**

for **Second Year Diploma in Pharmacy**

As per new syllabus prescribed by Pharmacy Council of India



VN Raje



CBS Publishers & Distributors Pvt Ltd
4819/XI, Prahlad Street, 24 Ansari Road, Daryaganj, New Delhi 110 002, India
E-mail: delhi@cbspd.com, cbspubs@airtelmail.in; Website: www.cbspd.com
New Delhi | Bengaluru | Chennai | Kochi | Kolkata | Lucknow | Mumbai
Hyderabad | Jharkhand | Nagpur | Patna | Pune | Uttarakhand



CBS Publishers & Distributors Pvt Ltd

CBS Confident Pharmacy Series

Pharmacology

Course Code: ER20-21T

for **Second Year Diploma in Pharmacy**

As per latest syllabus prescribed by Pharmacy Council of India

Salient Features

- Lucid and easy language
- To the point answers
- Remembering the concepts in the simplest way
- Infusing confidence in the reader to appear in the board examinations

Other books by the same author under

CBS Confident Pharmacy Series

- *Social Pharmacy* for First Year Diploma in Pharmacy
- *Pharmaceutics, 4/e* for First Year Diploma in Pharmacy
- *Pharmacognosy, 4/e* for First Year Diploma in Pharmacy
- *Pharmaceutical Chemistry, 4/e* for First Year Diploma in Pharmacy
- *Human Anatomy and Physiology, 4/e* for First Year Diploma in Pharmacy
- *Pharmacy Law and Ethics* for Second Year Diploma in Pharmacy
- *Biochemistry and Clinical Pathology, 4/e* for Second Year Diploma in Pharmacy
- *Hospital and Clinical Pharmacy, 4/e* for Second Year Diploma in Pharmacy
- *Pharmacotherapeutics* for Second Year Diploma in Pharmacy
- *Community Pharmacy and Management* for Second Year Diploma in Pharmacy

CBS Confident Pharmacy Series

Pharmacology

Course Code: ER20-21T
for **Second Year Diploma in Pharmacy**

As per latest syllabus prescribed by Pharmacy Council of India

VN Raje MPharm, MBA

Principal
Gourishankar Education Society's
GES College of Pharmacy (DPharm)
Limb, Satara, Maharashtra



CBS Publishers & Distributors Pvt Ltd

New Delhi • Bengaluru • Chennai • Kochi • Kolkata • Lucknow • Mumbai
Hyderabad • Jharkhand • Nagpur • Patna • Pune • Uttarakhand

CBS Confident Pharmacy Series

Pharmacology

Course Code: ER20-21T
for **Second Year Diploma in Pharmacy**
As per latest syllabus prescribed by Pharmacy Council of India

Disclaimer

Science and technology are constantly changing fields. New research and experience broaden the scope of information and knowledge. The author has tried his best in giving information available to him while preparing the material for this book. Although, all efforts have been made to ensure optimum accuracy of the material, yet it is quite possible some errors might have been left uncorrected. The publisher, the printer and the author will not be held responsible for any inadvertent errors or inaccuracies.

ISBN: 978-93-5466-502-8

Copyright © Author and Publisher

First Edition: 2023

All rights reserved. No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or any information storage and retrieval system without permission, in written, from the author and the publisher.

Published by Satish Kumar Jain and produced by Varun Jain for

CBS Publishers & Distributors Pvt Ltd

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

Ph: 011-23289259, 23266861, 23266867

Website: www.cbspd.com

Fax: 011-23243014

e-mail: delhi@cbspd.com; cbspdubs@airtelmail.in

Corporate Office: 204 FIE, Industrial Area, Patparganj, Delhi 110 092

Ph: 011-4934 4934

Fax: 011-4934 4935

e-mail: publishing@cbspd.com; publicity@cbspd.com

Branches

- **Bengaluru:** Seema House 2975, 17th Cross, KR Road, Banasankari 2nd Stage, Bengaluru 560 070, Karnataka, India
Ph: +91-80-26771678/79 Fax: +91-80-26771680 e-mail: bangalore@cbspd.com
- **Chennai:** 7, Subbaraya Street, Shenoy Nagar, Chennai 600 030, Tamil Nadu, India
Ph: +91-44-26680620, 26681266 Fax: +91-44-42032115 e-mail: chennai@cbspd.com
- **Kochi:** 42/1325, 1326, Power House Road, Opp KSEB, Power House, Ernakulam, Kochi 682 018, India
Ph: +91-484-4059061-65 Fax: +91-484-4059065 e-mail: kochi@cbspd.com
- **Kolkata:** 147, Hind Ceramics Compound, 1st Floor, Nilgunj Road, Belghoria, Kolkata 700 056, West Bengal, India
Ph: +91-33-25633055-56 e-mail: kolkata@cbspd.com
- **Lucknow:** Basement, Khushnuma Complex, 7-Meerabai Marg (behind Jawahar Bhawan), Lucknow 226 001, India
Ph: +91-522-4000032 e-mail: tiwari.lucknow@cbspd.com
- **Mumbai:** PWD Shed, Gala no. 25/26, Ramchandra Bhatt Marg, Next to JJ Hospital Gate no. 2, Opp. Union Bank of India, Noorbaug Mumbai 400 009, Maharashtra, India
Ph: +91-22-66661880/89 e-mail: mumbai@cbspd.com

Representatives

- **Hyderabad** 0-9885175004 • **Jharkhand** 0-9811541605 • **Nagpur** 0-9421945513
- **Patna** 0-9334159340 • **Pune** 0-9923910676 • **Uttarakhand** 0-9716462459

Printed at Mudrak, Noida, UP, India

Preface

This book **Pharmacology** under the CBS Confident Pharmacy Series which builds self-confidence in students which helps to get success in the examinations. The book has been written to meet the requirements of students of Diploma in Pharmacy (D Pharm) in accordance with the new revised syllabus ER2020 prescribed by Pharmacy Council of India.

This book is small and humble effort has been put in for compiling necessary information on the subject. An attempt has been made to demystify and simplify the basic concepts for the students of pharmacy and to enable them get an evergreen success in MSBTE examinations and all other qualifying examinations throughout India.

The salient features of the present book are:

- Lucid and easy language
- To the point answers
- Remembering facts in the simplest way
- Infusing confidence in the reader to appear in the board examinations.

Hence, the series is named

CBS Confident Pharmacy Series

I am confident that this book will be useful to both the students and the teachers of Diploma in Pharmacy as well as the candidates desiring to succeed in competitive examinations for better job opportunities in pharmacy profession such as hospital pharmacists in PHCs, civil hospitals, etc.

Vijay N Raje

to
my beloved family

Acknowledgements

I express my heartfelt thanks to Prof Madan Jagtap, Chairman, Gourishankar Education Society, Satara, Maharashtra, for consistent encouragement and inspiration for writing this book.

I wish to acknowledge the prompt and efficient help given by Prof Milind Jagtap, Mr Jaywant Salunkhe, Mr Appa Rajage, Mr Nitin Mudalgikar, and Mr Shrirang Katekar of Gourishankar Education Society, Satara.

I am also thankful to Shri Satish Kumar Jain, Chairman and Managing Director, and Shri Shantanu Sarkar, Assistant General Manager, Mumbai Branch, CBS Publishers & Distributors Pvt Ltd, for their sustained efforts and keen interest in the publication of this book.

I wish all my beloved students to have a great success in the board examinations.

Vijay N Raje

Syllabus

(As per PCI New ER 2020)

Pharmacology

Course Code: ER20-21T

1. General Pharmacology

- Introduction and scope of Pharmacology
- Various routes of drug administration—advantages and disadvantages
- Drug absorption—definition, types, factors affecting drug absorption
- Bioavailability and the factors affecting bioavailability
- Drug distribution—definition, factors affecting drug distribution
- Biotransformation of drugs—definition, types of biotransformation reactions, factors influencing drug metabolisms
- Excretion of drugs—definition, routes of drug excretion
- General mechanisms of drug action and factors modifying drug action

2. Drugs Acting on the Peripheral Nervous System

- Steps involved in neurohumoral transmission
- Definition, classification, pharmacological actions, dose, indication and contraindications of
 - a. Cholinergic drugs
 - b. Anti-cholinergic drugs
 - c. Adrenergic drugs
 - d. Anti-adrenergic drugs
 - e. Neuromuscular blocking agents
 - f. Drugs used in myasthenia gravis
 - g. Local anaesthetic agents
 - h. Non-steroidal anti-inflammatory drugs (NSAIDs)

3. Drugs Acting on the Eye

Definition, classification, pharmacological actions, dose, indications and contraindications of

- Miotics
- Mydriatics
- Drugs used in Glaucoma

4. Drugs Acting on the Central Nervous System

Definition, classification, pharmacological actions, dose, indications, and contraindications of

- General anaesthetics
- Hypnotics and sedatives
- Anti-convulsant drugs
- Anti-anxiety drugs
- Anti-depressant drugs
- Anti-psychotics
- Nootropic agents
- Centrally acting muscle relaxants
- Opioid analgesics

5. Drugs Acting on the Cardiovascular System

Definition, classification, pharmacological actions, dose, indications and contraindications of

- Anti-hypertensive drugs
- Anti-anginal drugs
- Anti-arrhythmic drugs
- Drugs used in atherosclerosis and
- Congestive heart failure
- Drug therapy for shock

6. Drugs Acting on Blood and Blood Forming Organs

Definition, classification, pharmacological actions, dose, indications and contraindications of

- Hematinic agents
- Anti-coagulants
- Anti-platelet agents
- Thrombolytic drugs

7. Drugs Acting on Respiratory System

Definition, classification, pharmacological actions, dose, indications and contraindications of

- Bronchodilators
- Expectorants
- Anti-tussive agents
- Mucolytic agents

8. Drugs Acting on the Gastrointestinal Tract

Definition, classification, pharmacological actions, dose, indications and contraindications of

- Anti-ulcer drugs
- Anti-emetics
- Laxatives and purgatives
- Anti-diarrhoeal drugs

9. Drugs Acting on the Kidney

Definition, classification, pharmacological actions, dose, indications and contraindications of

- Diuretics
- Anti-diuretics

10. Hormones and Hormone Antagonists

Physiological and pathological role and clinical uses of

- Thyroid hormones
- Anti-thyroid drugs
- Parathormone
- Calcitonin
- Vitamin D
- Insulin
- Oral hypoglycemic agents
- Estrogen
- Progesterone
- Oxytocin
- Corticosteroids

11. Autocoids

- Physiological role of histamine, 5-HT and prostaglandins
- Classification, clinical uses and adverse effects of antihistamines and 5-HT antagonists

12. Chemotherapeutic Agents: Introduction, basic principles of chemotherapy of infections, infestations and neoplastic diseases, classification, dose, indication and contraindications of drugs belonging to following classes:

- Penicillins
- Cephalosporins
- Aminoglycosides
- Fluoroquinolones
- Macrolides
- Tetracyclines
- Sulphonamides
- Anti-tubercular drugs
- Anti-fungal drugs
- Anti-viral drugs
- Anti-amoebic agents
- Anthelmintics
- Anti-malarial agents
- Anti-neoplastic agents

13. Biologicals

Definition, types and indications of biological agents with examples

Contents

<i>Preface</i>	v
<i>Syllabus</i>	vii
1. General Pharmacology	1
A. Scope of Pharmacology	1
B. Routes of Administration of Drugs	3
C. Absorption of Drugs	10
D. Bioavailability	12
E. Distribution of Drug in the Body	13
F. Biotransformation/Metabolism of Drugs	16
G. Excretion/Disposition of Drugs (Elimination of Drugs)	18
H. Factors Modifying Drug Action	20
2. Drugs Acting on Peripheral Nervous System	29
A. Cholinergic Drugs/Parasympathomimetics	30
B. Anticholinergic	34
C. Adrenergics	37
D. Antiadrenergics	41
E. Neuromuscular Blocking Agents	44
F. Drugs used in Myasthenia Gravis	45
G. Local Anaesthetic Agents	51
H. Nonsteroidal Anti-inflammatory Drugs (NSAIDs)	54
3. Drugs Acting on Eye	60
A. Miotics	60
B. Mydriatics	61
C. Drugs used in Glaucoma	62
4. Drugs Acting on Central Nervous System	64
A. General Anaesthetics	64
B. Hypnotics and Sedatives	77
C. Anticonvulsant Drugs (Antiepileptic Drugs)	83
D. Antianxiety Drugs/Anxiolytics	87
E. Antidepressants/Psychoanaleptics	89

x Pharmacology

F. Antipsychotics	93
G. Nootropic Agents	99
H. Centrally Acting Muscle Relaxants	101
I. Opioid Analgesics	103

5. Drugs Acting on Cardiovascular System 114

A. Antihypertensive Drugs	114
B. Antianginal Drugs	116
C. Antiarrhythmic Drugs	120
D. Drugs used in Atherosclerosis	122
E. Drugs used in Congestive Heart Failure (CHF)	123
F. Drug Therapy for Shock	125

6. Drugs Acting on Blood and Blood Forming Organs 130

A. Haematinics	130
B. Anticoagulants	134
C. Antiplatelet Agents	136
D. Thrombolytic/Fibrinolytic Drugs	137

7. Drugs Acting on Respiratory System 142

A. Bronchodilators	142
B. Antitussive (Anticough) Agents	144
C. Expectorants	146
D. Mucolytic Agents	146

8. Drugs Acting on Gastrointestinal Tract 149

A. Antiulcer Drugs	149
B. Antiemetics	154
C. Laxatives and Purgatives	156
D. Antidiarrhoeal Drugs	159

9. Drugs Acting on Kidney 162

A. Diuretics	162
B. Antidiuretics	168

10. Hormone and Hormone Antagonists 173

A. Thyroid Hormones	173
B. Antithyroid Drugs	174
C. Parathormone	175
D. Calcitonin (Thyrocalcitonin)	177
E. Vitamin D	178
F. Insulin	179

G. Oral Hypoglycemic Agents/Oral Antidiabetic Agents	183
H. Oestrogens	186
I. Progesterone	187
J. Oxytocin	191
K. Corticosteroids (Adrenocortical Hormones)	193
11. Autocoids	196
12. Chemotherapeutic Agents	205
A. Penicillins	206
B. Cephalosporins	208
C. Aminoglycosides	209
D. Fluoroquinolones	210
E. Macrolides	211
F. Tetracyclines	212
G. Sulphonamides	216
H. Antitubercular Agents	221
I. Antifungal Drugs	222
J. Antiviral Drugs	225
K. Antiamoebic Drugs	232
L. Anthelmintics (Antiworms)	234
M. Antimalarial Drugs	236
N. Antineoplastic Agents	238
13. Biologicals	244
Miscellaneous (Objective Questions)	247
Sample Question Paper 1	252
Sample Question Paper 2	254
