

# Contents

<b>UNIT I</b>	<b>EVOLUTION OF THE PHARMACY</b> .....	1
<b>Chapter 1</b>	<b>Pharmacy History</b> .....	3
	<b>Egyptian History</b>	4
	<b>Greek Influence</b>	4
	<b>British Apothecaries</b>	5
	<b>American Pharmacy Pre 1900</b>	6
	<b>Pharmacy in the 20th Century</b>	6
	<b>Development of the Pharmacy Technician's Role</b>	8
	<b>Scope of Practice for Pharmacy Technicians</b>	10
	<b>Standards of Practice</b>	10
	<b>Professional Judgment</b>	10
	<b>Technician Development</b>	11
	<b>Chapter Summary</b>	14
	<i>Review Questions</i>	14
	<i>Learning Activity</i>	16
<b>Chapter 2</b>	<b>Pharmacy of Today and Tomorrow</b> .....	17
	<b>Community Pharmacy</b>	18
	<b>Inpatient Hospital Pharmacy</b>	24
	<b>Home Infusion Pharmacies</b>	29
	<b>Compounding Pharmacies</b>	29
	<b>Nuclear Pharmacy</b>	30
	<b>Telepharmacy</b>	30
	<b>Long-Term Care Pharmacies</b>	31
	<b>Mail-Order Pharmacy</b>	32
	<b>Common Aspects of Technician Training</b>	33
	<b>Chapter Summary</b>	35
	<i>Review Questions</i>	36
	<i>Learning Activity</i>	39
<b>Chapter 3</b>	<b>Professional Roles in the Pharmacy</b> .....	41
	<b>Professionalism</b>	42
	<b>Positions Available for Pharmacy Technicians</b>	44
	<b>Computer Software Programmer</b>	49
	<b>Vision for the Future</b>	49

	<b>Chapter Summary</b>	50
	<i>Review Questions</i>	51
	<i>Learning Activity</i>	53
<b>UNIT II</b>	<b>PHARMACY LAW, ETHICS, AND CONFIDENTIALITY</b>	55
<b>Chapter 4</b>	<b>Pharmacy Law</b>	57
	20th-Century Regulation of Drugs	58
	Legal Guidelines for Filling Prescriptions	59
	Additional Legal Requirements for Controlled Drug Prescriptions	62
	Exempt Narcotics	63
	Storage, Theft, and Mailing Requirements for Controlled Drugs	64
	Record-Keeping for Controlled Drugs	64
	Ordering Controlled Drugs	64
	Authorized Prescribers for Controlled Drugs	67
	Investigational New Drug Application	68
	Expiration Dates and Drug Recalls	69
	Nonprescription Medications	70
	Poisonous Substances	70
	Transferring Prescriptions Between Pharmacies	71
	Torts and Legal Liability	71
	Health Insurance Portability and Accountability Act	73
	<b>Chapter Summary</b>	74
	<i>Review Questions</i>	75
	<i>Learning Activity</i>	78
<b>Chapter 5</b>	<b>Differentiating Law and Ethics</b>	79
	<b>Ethical Codes</b>	81
	<b>Guidelines For Ethical Decision-Making</b>	82
	<b>Managing Ethical Dilemmas</b>	84
	<b>Chapter Summary</b>	87
	<i>Review Questions</i>	87
	<i>Learning Activity</i>	89
<b>Chapter 6</b>	<b>Confidentiality and HIPAA</b>	91
	<b>Health Insurance Portability and Accountability Act</b>	92
	<b>Protected Health Information Protocols</b>	92
	<b>Procedures for Protecting Health Information in the Pharmacy</b>	93
	<b>Verbal Health Information</b>	93
	<b>Chapter Summary</b>	96
	<i>Review Questions</i>	96
	<i>Learning Activity</i>	99

<b>UNIT III</b>	<b>TECHNICIAN'S ROLE IN ENSURING PATIENT RIGHTS</b> .....	101
<b>Chapter 7</b>	<b>The Right Medication to the Right Patient at the Right Time: Communicating Clearly</b> .....	103
	<b>Outpatient Prescription</b> .....	104
	<b>Inpatient Prescriptions</b> .....	107
	<b>Communicating with the Patient</b> .....	110
	<b>Evaluating the Prescription</b> .....	113
	<b>Prescription Turnaround Time</b> .....	114
	<b>Medication Order Turnaround Time</b> .....	115
	<b>Pharmaceutical Abbreviations</b> .....	115
	<b>Overcoming the "Halo Effect"</b> .....	115
	<b>Chapter Summary</b> .....	117
	<i>Review Questions</i> .....	118
	<i>Learning Activity</i> .....	120
<b>Chapter 8</b>	<b>The Right Dosage Form and the Right Route of Administration: Working With Accuracy</b> .....	123
	<b>Solid Oral Dosage Forms</b> .....	124
	<b>Liquid Dosage Forms</b> .....	131
	<b>Routes of Administration</b> .....	132
	<b>Chapter Summary</b> .....	140
	<i>Review Questions</i> .....	141
	<i>Learning Activity</i> .....	142
<b>Chapter 9</b>	<b>At the Right Price: Handling Payment</b> .....	145
	<b>Healthcare Costs</b> .....	146
	<b>Types of Insurance Plans</b> .....	146
	<b>Chapter Summary</b> .....	156
	<i>Review Questions</i> .....	156
<b>Chapter 10</b>	<b>Medication Error Prevention</b> .....	159
	<b>Types of Medication Errors</b> .....	160
	<b>The Technician's Professional Approach to Medication Errors</b> .....	163
	<b>Chapter Summary</b> .....	167
	<i>Review Questions</i> .....	167
	<i>Learning Activity</i> .....	169
<b>UNIT IV</b>	<b>MECHANICS OF MEDICATION DISPENSING AND INVENTORY CONTROL</b> .....	171
<b>Chapter 11</b>	<b>Over-the-Counter Medications and Herbal Products</b> .....	173
	<b>Categorizing Nonprescription Drugs</b> .....	174
	<b>Cough, Cold, and Allergy Preparations</b> .....	179
	<b>Herbal Remedies</b> .....	182

	<b>Chapter Summary</b>	187
	<i>Review Questions</i>	188
	<i>Learning Activity</i>	190
<b>Chapter 12</b>	<b>Outpatient Prescriptions</b>	191
	<b>Independent Retail Pharmacy</b>	192
	<b>Clinic Pharmacy</b>	199
	<b>Chain Pharmacy</b>	199
	<b>Chapter Summary</b>	201
	<i>Review Questions</i>	202
<b>Chapter 13</b>	<b>Inpatient Hospital and Homecare Prescriptions</b>	205
	<b>Inpatient Hospital Pharmacy</b>	206
	<b>Homecare Practice Setting</b>	214
	<b>Phone Triage</b>	214
	<b>Chapter Summary</b>	216
	<i>Review Questions</i>	217
	<i>Learning Activity</i>	219
<b>Chapter 14</b>	<b>Inventory Control</b>	221
	<b>The Formulary System</b>	222
	<b>Product Buying Sources</b>	223
	<b>Ordering Processes</b>	224
	<b>Receiving Process</b>	224
	<b>Product Storage and Handling</b>	225
	<b>Expiration Dating</b>	225
	<b>Investigational Drugs</b>	226
	<b>Controlled Drugs</b>	226
	<b>Inventory Management</b>	226
	<b>Chapter Summary</b>	227
	<i>Review Questions</i>	227
<b>UNIT V</b>	<b>EXTEMPORANEOUS COMPOUNDING</b>	231
<b>Chapter 15</b>	<b>Compounding Equipment and Use</b>	233
	<b>Definition of Compounding</b>	234
	<b>Basic Compounding Procedures</b>	234
	<b>Legislation Concerning Compounding</b>	235
	<b>Reasons for Compounding</b>	235
	<b>Compounding Facilities</b>	236
	<b>Compounding Equipment</b>	236
	<b>Mortars and Pestles</b>	243
	<b>Mixing and Transferring Equipment</b>	244

<b>Chapter Summary</b>	246
<i>Review Questions</i>	247
<i>Learning Activity</i>	249
<b>Chapter 16 Solutions, Syrups, and Suspensions</b> .....	251
<b>Reconstitution of Oral Antibiotic Powders</b>	252
<b>Solutions</b>	253
<b>Suspensions</b>	255
<b>Types of Vehicles</b>	256
<b>Preservatives</b>	259
<b>Chapter Summary</b>	260
<i>Review Questions</i>	260
<b>Chapter 17 Dry Powders, Capsules, and Lozenges</b> .....	263
<b>Bulk Powders for External Use</b>	264
<b>Capsules as an Extemporaneous Compound</b>	267
<b>Compounded Lozenges</b>	272
<b>Chapter Summary</b>	278
<i>Review Questions</i>	278
<b>Chapter 18 Ointments, Creams, Gels, Pastes, and Suppositories</b> .....	281
<b>Advantages of Compounded Topical Preparations</b>	282
<b>Disadvantages of Compounded Topical Preparations</b>	282
<b>Therapeutic Uses of Compounded Topical Preparations</b>	282
<b>Ointments</b>	283
<b>Lip Balms and Topical Application Sticks</b>	290
<b>Suppositories</b>	292
<b>Vaginal Suppositories</b>	293
<b>Urethral Suppositories</b>	293
<b>Chapter Summary</b>	295
<i>Review Questions</i>	296
<i>Learning Activity</i>	198
<b>UNIT VI COMPOUNDED STERILE PRODUCTS</b> .....	299
<b>Chapter 19 Introduction to Microbiology and Aseptic Technique</b> .....	301
<b>Classifications of Bacteria</b>	302
<b>Prokaryotes and Eukaryotes</b>	303
<b>Pathogen Transmission</b>	303
<b>Portals of Entry and Exit</b>	305
<b>Pathogenic Processes</b>	305
<b>Microbial-Host Relationships</b>	305
<b>Viruses</b>	306
<b>Rickettsiae</b>	306
<b>Fungi</b>	306

	<b>Risk Factors for Opportunistic Fungal Infections</b>	307
	<b>Yeasts</b>	307
	<b>Helminths</b>	307
	<b>Importance of Microbiology to the Pharmacy Technician</b>	307
	<b>Chapter Summary</b>	309
	<i>Review Questions</i>	309
<b>Chapter 20</b>	<b>Chapter 797 Guidelines for Compounded Sterile Products</b>	313
	<b>Risk Levels</b>	314
	<b>Cleanroom and Anteroom</b>	315
	<b>Compounding Equipment</b>	315
	<b>Gowning and Gloving by Compounders</b>	317
	<b>Aseptic Technique</b>	318
	<i>Review Questions</i>	322
	<i>Learning Activity</i>	324
<b>Chapter 21</b>	<b>Large and Small Volume Parenterals</b>	325
	<b>Routes of Administration for Parenteral Products</b>	326
	<b>Advantages of Parenteral Products</b>	327
	<b>Disadvantages of Parenteral Products</b>	327
	<b>Large-Volume Parenterals</b>	327
	<b>Small-Volume Parenterals</b>	328
	<b>Labeling Requirements for Compounded Parenterals</b>	330
	<b>Beyond-Use Dating</b>	331
	<b>Media Fill Processes for Compounder Validation</b>	333
	<b>Chapter Summary</b>	336
	<i>Review Questions</i>	337
	<i>Learning Activity</i>	339
<b>Chapter 22</b>	<b>Total Parenteral Nutrition</b>	341
	<b>Uses of TPN</b>	342
	<b>Base Components of a TPN</b>	343
	<b>Using a TPN as a Drug Delivery Vehicle</b>	344
	<b>Compounding TPN</b>	345
	<b>Chapter Summary</b>	347
	<i>Review Questions</i>	348
	<i>Learning Activity</i>	350
<b>Chapter 23</b>	<b>Compounding Sterile Chemotherapeutic Products</b>	351
	<b>Types of Hazardous Drugs</b>	352
	<b>Potential for Exposure to Hazardous Drugs</b>	352
	<b>Safe Handling of Hazardous Drugs</b>	353
	<b>Compounding Sterile Hazardous Preparations</b>	353
	<b>Hazardous Material Spill Kit</b>	354

**Chapter Summary** 355  
*Review Questions* 356  
*Learning Activity* 358

**UNIT VII PROFESSIONALISM AND CAREER EXPLORATION** ..... 359

**Chapter 24 Professional Organizations and Education** ..... 361

**ASHP** 362  
**APhA** 362  
**ACPE** 363  
**AACP** 363  
**NABP** 363  
**NACDS** 364  
**ExCPT** 364  
**PTCB** 364  
**PTEC** 365  
**AAPT** 365  
**NPTA** 365  
**State BOPs** 366  
**Chapter Summary** 366  
*Review Questions* 367  
*Learning Activity* 369

**Chapter 25 Expanding Horizons for Technicians** ..... 371

**Pharmacy Technician Specialty Areas** 372  
**Pharmacy Technician Oncology Specialist** 372  
**Pharmacy Technician HIV-AIDS Specialist** 373  
**Stepping-Stones for Technicians** 373  
**Developing a Career Ladder** 373  
**Search for Career Opportunities** 375  
**Resume Construction** 375  
**Chapter Summary** 378  
*Review Questions* x  
*Learning Activity* 378

**Appendix A: Calculation Formulas and Tables** ..... 379

**Appendix B: Abbreviation Watch List** ..... 383

**Appendix C: High-Risk Medications** ..... 385

**Glossary** ..... 387

**Index** ..... 411