

## Contents

---

<i>Preface</i> .....	(v)
<i>Acknowledgements</i> .....	(vii)
<i>Abbreviations</i> .....	(xxvii)

### CHAPTER 1

#### INTRODUCTION TO PHARMACEUTICAL INORGANIC CHEMISTRY

1.1 Pharmaceutical Chemistry .....	1
1.1.1 Inorganic Chemistry .....	1
1.1.2 Inorganic Compounds.....	1
1.1.3 Importance of Inorganic Pharmaceuticals .....	2
1.2 Pharmacopoeia.....	6
1.2.1 Monograph.....	6
1.2.2 History of Pharmacopoeia .....	7
1.3 Indian Pharmacopoeia .....	8
1.3.1 Features of various Editions of Indian Pharmacopoeia .....	10
1.3.2 Indian Pharmacopoeia 2010.....	11
1.3.3 Format.....	11
1.3.4 Changes.....	12
1.3.5 General Chapters.....	12
1.3.6 Pharmacopoeial Description/Presentation .....	14
1.3.7 General Monographs.....	14
1.3.8 Production.....	15
1.3.9 Manufacture of Drug Products.....	15
1.3.10 Excipients .....	15
1.3.11 Individual Monographs.....	15
1.3.12 Representative example of a Monograph of Indian Pharmacopoeia 2010.....	20
1.3.13 Indian Pharmacopoeia 2014.....	22
1.4 Extra Pharmacopoeia (Martindale).....	22

1.5	British Pharmacopoeia.....	23
1.5.1	Highlights of British Pharmacopoeia 2014 .....	25
1.6	European Pharmacopoeia .....	25
1.7	Pharmacopoeia Internationals (International Pharmacopoeia).....	26
1.8	United States Pharmacopoeia (USP) .....	26
1.9	Pharmaceutical Index .....	27
1.10	The Drugs and Cosmetics Act 1940 .....	27
1.10.1	Scope .....	27
1.10.2	Objectives.....	27
1.10.3	Features of Drugs and Cosmetics Act 1940 .....	27
1.10.4	Standard of Quality .....	28
1.10.5	License to Sell, Stock, Exhibit or Offer for Sale or Distribute Drugs by Retail other than those Specified in (Schedules c, c (1) and (x)) .....	29
1.10.6	Conditions for License .....	29
1.11	Classification of Inorganic Pharmaceuticals.....	29
1.12	Pharmaceutical Aids .....	34
	<b>Probable Questions.....</b>	<b>35</b>

## CHAPTER 2

### **BASICS OF PHARMACEUTICAL INORGANIC CHEMISTRY**

2.1	Atomic Symbols .....	37
2.2	Empirical Formula.....	38
2.3	Molecular Formula .....	39
2.4	Molecular Weight .....	40
2.5	Stoichiometric Equations.....	41
2.6	Chemical Equations .....	41
2.7	Balancing of Chemical Equations .....	42
2.7.1	Balanced Equation.....	42
2.7.2	Balancing Redox Reaction Equations .....	43
2.7.3	Electronic Concept of Oxidation and Reduction.....	44

2.8	Periodic Table.....	49
2.8.1	General Properties of the Elements in the Periodic Table .....	52
2.9	General Terms used in the Inorganic Chemistry .....	53
	<b>Probable Questions.....</b>	<b>60</b>

## CHAPTER 3

### ACIDS, BASES AND BUFFERS

3.1	Introduction .....	61
3.2	Various Concepts of Acids and Bases .....	61
3.2.1	Hard and Soft Acid-base Concept (HSAB concept).....	66
3.2.2	Relative Strength or Specification of Acidity and Basicity .....	67
3.2.3	Dissociation Constants.....	67
3.2.4	Strong Acids and Bases .....	68
3.2.5	Weak Acids and Bases.....	68
3.2.6	Ionization Constant of Weak Acids .....	68
3.3	Hydrogen Ion Concentration, pH and pOH.....	69
3.3.1	pH and pOH Relationship.....	70
3.3.2	Relationship between Dissociation Constants and pH.....	70
3.3.3	Henderson-Hasselbalch Equation .....	71
3.3.4	Dissociation Constant of bases and pOH.....	71
3.4	Buffers .....	72
3.4.1	Definition.....	73
3.4.2	Types of Buffer Solution .....	73
3.4.3	Characteristics of Buffer Solution .....	73
3.4.4	Mechanism of Buffer Action .....	73
3.4.5	Henderson-Hasselbalch Equation .....	74
3.4.6	Buffer Capacity.....	74
3.5	Selection of Pharmaceutical Buffer System .....	74
3.6	Pharmaceutical Buffer Systems .....	75
3.6.1	Phosphate Buffer System.....	76
3.6.2	Borate Buffer System.....	77
3.7	Physiological Buffers .....	77
3.8	Role of Buffers in Pharmacy .....	79
	<b>Probable Questions.....</b>	<b>79</b>

**CHAPTER 4****QUANTITATIVE ANALYSIS  
(VOLUMETRIC AND GRAVIMETRIC ANALYSIS)**

4.1 Introduction .....	81
4.1.1 Volumetric Analysis .....	81
4.2 Types of Titrations.....	84
4.2.1 Acid Base Titrations .....	85
4.2.2 Non-aqueous Titrations.....	86
4.2.3 Oxidation reduction (Redox) Titrations.....	87
4.2.4 Precipitation Titrations .....	90
4.2.5 Complexometric Titrations.....	91
4.2.6 Diazotization Titrations .....	95
4.3 Gravimetric Analysis.....	95
4.4 Indicators .....	96
<b>Probable Questions.....</b>	<b>99</b>

**CHAPTER 5****QUALITY CONTROL AND TEST FOR PURITY**

5.1 Introduction .....	101
5.1.1 Impurities found in Drugs and Formulations (Pharmaceuticals).....	101
5.2 Sources of Impurities in Pharmaceuticals.....	102
5.3 Effect of Impurities.....	105
5.3.1 Permissible Impurities .....	106
5.4 Methods used to Purify the Inorganic Substances .....	106
5.5 Test for Purity.....	107
5.6 Common Tests for Permissible Impurities .....	110
5.7 Limit Test .....	116
5.7.1 Importance of Limit Tests.....	116
5.7.2 Limit Test for Chlorides .....	117
5.7.3 Limit Test for Sulphates .....	118
5.7.4 Limit Test for Iron .....	119
5.7.5 Limit Test for Heavy Metals.....	120
5.7.6 Limit Test for Lead.....	122
5.7.7 Limit Test for Arsenic.....	123

5.8 Identification Tests for Cations and Anions .....	128
5.8.1 Tests for Cations .....	128
5.8.2 Tests for Anions .....	141
<b>Probable Questions</b> .....	<b>154</b>

## CHAPTER 6

### INORGANIC PHARMACEUTICALS (INORGANIC COMPOUNDS USED IN PHARMACY)

6.1 Gastrointestinal Agents and Related Compounds .....	155
6.1.1 Digestive System .....	155
6.1.2 Acidifiers and Alkalinising Agents .....	157
• Dilute Hydrochloric Acid B.P. ....	157
• Dilute Phosphoric Acid I.P., B.P., U.S.P. ....	158
• Sodium Phosphate I.P., B.P., U.S.P. ....	159
• Dried Sodium Phosphate B.P. ....	161
• Sodium Acid Phosphate I.P. ....	162
• Dilute Ammonia Solution B.P. ....	163
• Ammonium Chloride I.P., B.P. ....	164
• Aromatic Spirit of Ammonia .....	167
6.1.3 Acids and Bases used as Pharmaceutical Aids .....	168
• Hydrochloric Acid I.P., B.P., U.S.P. ....	169
• Sulphuric Acid B.P., U.S.P. ....	172
• Phosphoric Acid I.P., U.S.P. ....	174
• Strong Ammonia Solution B.P., U.S.P. ....	176
• Dilute Ammonia Solution B.P. ....	178
• Sodium Carbonate I.P., B.P. ....	178
• Sodium Hydroxide I.P., B.P. ....	180
• Potassium Hydroxide B.P. ....	183
• Potassium Hydroxide Solution B.P., U.S.P. ....	184
• Calcium Hydroxide B.P., U.S.P. ....	185
• Dilute Phosphoric Acid B.P., U.S.P. ....	187
• Hypo Phosphorous Acid U.S.P. ....	187
6.1.4 Antacids .....	189
• Sodium Bicarbonate I.P., B.P., U.S.P. ....	193
• Sodium Bicarbonate Injection I.P., B.P., U.S.P. ....	195

---

• Compound Sodium Bicarbonate Tablets U.S.P. ....	196
• Potassium Citrate I.P., B.P., U.S.P. ....	196
• Aluminium Hydroxide Gel I.P., B.P., U.S.P. ....	198
• Dried Aluminium Hydroxide Gel I.P., B.P., U.S.P. ....	201
• Aluminium Hydroxide Gel Tablet U.S.P. ....	202
• Aluminium Glycinate B.P. ....	202
• Basic Aluminium Carbonate Gel U.S.P. ....	204
• Dried Aluminium Phosphate U.S.P. ....	205
• Magnesium Hydroxide I.P., B.P., U.S.P. ....	206
• Magnesium Hydroxide Mixture I.P., B.P. ....	208
• Magnesium Trisilicate I.P., U.S.P. ....	211
• Heavy Magnesium Carbonate I.P., U.S.P. ....	213
• Light Magnesium Carbonate I.P., U.S.P. ....	215
• Heavy Magnesium Oxide I.P., U.S.P. ....	215
• Light Magnesium Oxide I.P., U.S.P. ....	217
• Magnesium Phosphate U.S.P. ....	218
• Calcium Carbonate I.P., B.P., U.S.P. ....	218
• Tribasic Calcium Phosphate I.P., U.S.P. ....	220
• Sodium Citrate I.P., B.P. ....	222
• Bismuth Subcarbonate I.P., B.P., U.S.P. ....	224
• Magaldrate I.P., B.P., U.S.P. ....	224
6.1.5 Combination Antacid Preparations .....	225
6.1.6 Adsorbents and Protectives .....	225
• Light Kaolin I.P., B.P., U.S.P. ....	226
• Heavy Kaolin I.P., B.P., U.S.P. ....	227
• Activated Charcoal I.P., B.P. ....	228
• Bismuth Subcarbonate I.P. ....	228
• Bismuth Subgallate B.P., U.S.P. ....	230
• Bismuth Subnitrate I.P., B.P., U.S.P. ....	231
• Milk of Bismuth U.S.P. ....	233
6.1.7 Saline Cathartics .....	233
6.1.8 Purgatives .....	234
• Magnesium Hydroxide I.P., B.P., U.S.P. ....	235
• Magnesium Sulphate I.P., B.P., U.S.P. ....	236
• Magnesium Citrate Solution N.F. ....	238

---

• Magnesium Carbonate .....	238
• Sodium Phosphate .....	238
• Disodium Hydrogen Phosphate (Sodium phosphate) .....	238
• Potassium Bitartrate U.S.P. ....	239
• Calomel U.S.P. ....	240
<b>Probable Questions .....</b>	<b>242</b>
6.2 Topical Agents .....	246
6.2.1 Protectives .....	246
• Talc I.P., B.P. ....	247
• Zinc Oxide I.P., U.S.P. ....	248
• Zinc Oxide Compound Paste .....	250
• Zinc Gelatin Paste I.P. ....	251
• Zinc Undecylenate I.P. ....	252
• Zinc Undecylenate Ointment .....	254
• Calamine I.P., B.P., U.S.P. ....	255
• Calamine Lotion I.P. ....	257
• Aqueous Calamine Cream I.P. ....	257
• Calamine Ointment I.P. ....	258
• Zinc Stearate I.P., B.P., U.S.P. ....	259
• Titanium Dioxide I.P., U.S.P. ....	261
• Light Kaolin .....	263
• Heavy Kaolin .....	263
• Silicone Polymers .....	263
• Silicone .....	263
• Dimethicone U.S.P. ....	265
• Activated Dimethicone or Simethicone I.P., B.P., U.S.P. ....	265
• Aluminium as Protecting Agent - Aluminium .....	266
6.2.2 Minor Topical Agents .....	267
6.2.3 Astringents .....	267
• Alum U.S.P. ....	268
• Aluminium Chloride U.S.P. ....	270
• Aluminium Sulphate B.P., U.S.P. ....	271
• Aluminium Subacetate Solution U.S.P. ....	273
• Zinc Sulphate I.P., U.S.P. ....	273
• Zinc Chloride I.P., U.S.P. ....	276

---

•	Zinc Peroxide U.S.P.....	279
•	Calcium Hydroxide.....	280
6.2.4	Oxidative Antimicrobials.....	280
•	Hydrogen Peroxide I.P., B.P.....	283
•	Potassium Permanganate I.P., B.P., U.S.P.....	287
•	Sodium Perborate B.P.....	291
•	Chlorinated Lime I.P., B.P.....	292
•	Iodine Preparations.....	294
•	Iodine I.P.....	294
•	Weak Iodine Solution.....	297
•	Strong Iodine Solution.....	299
•	Aqueous Iodine Solution.....	301
•	Povidone-Iodine Solution I.P., U.S.P.....	302
•	Tincture of Iodine U.S.P.....	304
•	Iodised Oil Injection U.S.P.....	304
•	Boric Acid I.P., U.S.P.....	304
•	Sodium Carbonate.....	308
•	Sodium Hypochlorite Solution U.S.P.....	308
•	Dilute Sodium Hypochlorite Solution.....	309
6.2.5	Protein Precipitant Antimicrobials.....	310
•	Silver Nitrate I.P., B.P.....	310
•	Mild Silver Protein.....	313
•	Strong Silver Protein.....	314
•	Toughened Silver Nitrate.....	316
•	Mercury Compounds.....	316
•	Yellow Mercuric Oxide B.P., U.S.P.....	316
•	Mercuric Oxide Eye Ointment.....	318
•	Calomel or Mercurous Chloride B.P., U.S.P.....	319
•	Ammoniated Mercury U.S.P.....	319
•	Sulphur and Sulphur Compounds.....	321
•	Sulphur U.S.P.....	321
•	Sublimed Sulphur U.S.P.....	323
•	Precipitated Sulphur U.S.P.....	324
•	Other Allotropic Varieties of Sulphur.....	326
•	Sulphur Ointment U.S.P.....	326



---

• Boric Acid I.P. ....	327
• Borax I.P., B.P, U.S.P. ....	327
• Antimony Potassium Tartarate U.S.P. ....	329
• Selenium.....	329
• Selenium Sulphide B.P., U.S.P. ....	329
<b>Probable Questions.....</b>	<b>331</b>
6.3 Dental Products.....	333
6.3.1 Anticaries Agents.....	333
• Sodium Fluoride I.P., B.P., U.S.P. ....	334
• Sodium Monofluorophosphate U.S.P. ....	337
• Stannous Fluoride B.P.....	338
6.3.2 Dentifrices.....	339
• Calcium Carbonate I.P. B.P., U.S.P. ....	340
• Calcium Phosphate I.P., B.P., U.S.P. ....	341
• Dibasic Calcium Phosphate I.P., B.P. ....	341
6.3.3 Desensitizing Agents ....	343
• Strontium Chloride U.S.P. ....	343
• Zinc Chloride I.P.....	344
• Sodium Meta Phosphate BPC.....	346
• Pumice U.S.P. ....	347
6.3.4 Dentifrices with Desensitizing Agent .....	347
• Zinc Chloride .....	347
• Ammoniacal Silver Nitrate Solution N.F. ....	347
6.3.5 Oral Antiseptics and Astringents .....	347
• Hydrogen Peroxide .....	347
• Sodium Peroxide N.F.....	348
• Magnesium Peroxide N.F.....	348
• Zinc Peroxide.....	348
• Sodium Perborate.....	349
6.3.6 Mouth Washes .....	349
6.3.7 Cements and Fillers .....	349
• Zinc Oxide.....	350
<b>Probable Questions.....</b>	<b>350</b>

---

6.4 Major Intra and Extra Cellular Electrolytes.....	351
6.4.1 Sodium Replenishers .....	357
• Sodium Chloride I.P., B.P., U.S.P.....	357
• Sodium Chloride Solution B.P.....	359
• Compound Sodium Chloride Solution I.P. ....	359
• Sodium Chloride Injection I.P., B.P., U.S.P. ....	360
• Sodium Chloride Tablets B.P.....	361
• Compound Sodium Chloride Injection I.P., B.P. ....	361
• Sodium Chloride Eye Lotion B.P.....	363
• Hypertonic Saline I.P. ....	363
• Sodium Chloride and Dextrose Injection I.P. ....	364
• Sodium Chloride and Fructose Injection I.P. ....	364
• Compound Sodium Chloride and Dextrose Injection I.P.....	365
• Sodium Chloride Irrigation Solution I.P. ....	365
• Sodium Lactate Injection I.P.....	366
• Compound Sodium Lactate Injection I.P. ....	367
• Compound Sodium Lactate and Dextrose Injection I.P. ....	368
• Half Strength Compound Sodium Lactate and Dextrose Injection I.P.....	369
• Modified Compound Sodium Lactate and Dextrose Injection I.P.....	369
• Compound Sodium Lactate Solution for Irrigation I.P.....	369
• Sodium Chloride and Mannitol Injection U.S.P .....	370
6.4.2 Potassium Replenishers .....	370
• Potassium Chloride I.P., B.P., U.S.P.....	370
• Potassium Chloride and Dextrose Injection I.P. ....	372
• Potassium Chloride, Sodium Chloride and Dextrose Injection I.P.....	372
6.4.3 Calcium Replenishers .....	373
• Calcium Chloride I.P., B.P.....	373
• Calcium Gluconate I.P., B.P. ....	375
• Calcium Gluconate Injection I.P. ....	378
• Calcium Gluconate Tablets I.P. ....	379
• Calcium Gluconate Effervescent Tablet B.P.....	379
• Dibasic Calcium Phosphate.....	379

6.4.4	Electrolytes used in acid base Therapy .....	380
	• Sodium Acetate I.P., B.P.....	381
	• Potassium Acetate I.P., B.P.....	382
	• Sodium Bicarbonate, Sodium Bicarbonate Injection, Compound Sodium Bicarbonate Tablets, Sodium Phosphate, Dried Sodium Phosphate, Sodium Citrate.....	385
	• Sodium Citrate Tablets B.P.....	385
	• Sodium Citrate Anticoagulant Injection.....	385
	• Potassium Bicarbonate U.S.P.....	386
	• Potassium Citrate, Sodium Lactate Injection, Ammonium Chloride, Ammonium Chloride Injection, Compound Sodium Chloride Injection .....	386
6.4.5	Electrolytes Combination Therapy .....	386
	• Oral Rehydration Salts (ORS) .....	387
6.4.6	Dialysis Fluids .....	388
	• Haemodialysis Fluid .....	389
	• Peritoneal Dialysis Fluid.....	389
	<b>Probable Questions.....</b>	<b>390</b>
6.5	Medicinal Gases (Inhalants) .....	392
	• Nitrous Oxide I.P., B.P., U.S.P. ....	392
	• Oxygen I. P. ....	395
	• Carbondioxide I.P. ....	399
	• Helium B.P., U.S.P. ....	402
	• Nitrogen U.S.P.....	402
	• Dilute Ammonia Solution I.P., B.P.....	403
	• Ammonium Carbonate B.P., U.S.P.....	403
	<b>Probable Questions.....</b>	<b>404</b>
6.6	Essential Trace Elements.....	405
	6.6.1 Haematinics .....	405
	• Iron.....	405
	• Vitamin B12.....	407
	• Folic acid .....	408
	• Ferrous Sulphate I.P.....	408
	• Dried Ferrous Sulphate I.P., B.P., U.S.P. ....	411
	• Ferrous Sulphate Tablets I.P., B.P., U.S.P.....	411

---

• Ferrous Sulphate Paediatric Mixture B.P.....	412
• Ferrous Fumarate I.P., B.P., U.S.P. ....	412
• Ferrous Fumarate Tablets I.P., B.P.....	414
• Ferrous Gluconate I.P., B.P. ....	414
• Ferrous Gluconate Tablets I.P., B.P.....	417
• Ferrous Succinate .....	417
• Ferric Ammonium Citrate I.P., B.P. ....	418
• Iron and Dextran Injection I.P., B.P.....	420
• Iron-Sorbitol Injection I.P., B.P.....	421
6.6.2 Other Essential Trace Elements .....	423
• Iron.....	423
• Copper.....	425
• Zinc .....	426
• Chromium .....	427
• Manganese .....	428
• Molybdenum.....	428
• Sulphur.....	429
• Iodine .....	429
• Selenium .....	430
• Phosphates .....	431
• Sodium Acid Phosphate.....	431
• Sodium Phosphate.....	431
• Halogens .....	431
• Iodine and its Solutions.....	431
• Fluorides .....	431
<b>Probable Questions.....</b>	<b>431</b>
6.7 Pharmaceutical Aids .....	432
6.7.1 Adsorbents and Absorbents .....	432
• Activated Charcoal .....	432
• Aluminium Sulphate B.P., U.S.P.....	432
• Aluminium Phosphate B.P., U.S.P. ....	433
6.7.2 Anti Oxidants.....	433
• Sodium Sulphite B.P., U.S.P. ....	434
• Sodium Bisulphite .....	434
• Sodium Metabisulphite I.P., B.P., U.S.P. ....	435

---

• Sodium Thiosulphate I.P., B.P.....	436
• Sodium Thiosulphate Injection I.P. ....	440
• Hypo Phosphorous Acid .....	441
• Sodium Nitrite U.S.P. ....	441
• Nitrogen and Carbon Dioxide.....	444
6.7.3 Desiccants .....	444
• Silica Gel .....	444
6.7.4 Excipients .....	444
• Dibasic Calcium Phosphate I.P.....	444
• Tribasic Calcium Phosphate I.P.....	446
• Magnesium Stearate I.P., B.P. ....	446
• Talc .....	448
• Precipitated Chalk.....	448
6.7.5 Suspending Agents .....	448
• Bentonite I.P., B.P. ....	448
• Colloidal Silica B.P.....	449
• Aluminium Stearate B.P., U.S.P. ....	450
6.7.6 Colourants.....	451
• Titanium Dioxide.....	451
• Ferric Oxide.....	451
6.7.7 Solvents and Vehicles.....	452
• Purified Water I.P. ....	452
• Water for Injection I.P., B.P., U.S.P.....	455
• Sterile Water for Injection I.P.....	456
6.7.8 Filter Aids.....	456
• Talc .....	456
• Light Kaolin.....	456
• Kieshelguhr.....	456
• Fullers Earth U.S.P. ....	457
6.7.9 Preservatives .....	457
6.7.10 Sclerosing Agents .....	458
• Sodium Tetra Decyl Sulphate B.P. ....	458
• Hypertonic Saline I.P.....	459
<b>Probable Questions .....</b>	<b>459</b>

---

6.8 Miscellaneous Agents.....	461
6.8.1 Expectorants .....	461
• Potassium Citrate I.P., B.P.....	461
• Potassium Iodide I.P., B.P., U.S.P.....	461
• Sodium Iodide B.P., U.S.P.....	463
• Ammonium Chloride.....	464
• Ammonium Acetate U.S.P.....	464
• Ammonium Carbonate.....	465
6.8.2 Sedatives.....	465
• Potassium Bromide I.P. ....	465
6.8.3 Antidotes.....	467
• Sodium Nitrite U.S.P. ....	468
• Sodium Thiosulphate.....	469
• Sodium Thiosulphate Injection.....	469
• Charcoal.....	469
6.8.4 Respiratory Stimulants.....	469
• Ammonium Carbonate U.S.P. ....	469
• Aromatic Spirit of Ammonia U.S.P.....	469
• Dilute Ammonia Solution I.P., B.P.....	469
6.8.5 Emetics .....	469
• Potassium Antimony Tartarate B.P., U.S.P.....	470
• Sodium Antimony Tartarate B.P. ....	472
• Sodium Antimony Tartarate Injection.....	473
• Zinc Sulphate.....	473
• Copper Sulphate I.P.....	473
6.8.6 Internal Parasiticides.....	475
• Sodium Antimony Gluconate I.P. ....	475
• Sodium Antimony Gluconate Injection I.P.....	478
• Antimony Potassium Tartarate .....	478
• Antimony Sodium Tartarate B.P. ....	478
• Antimony Sodium Tartarate Injection .....	478

6.8.7 Antineoplastic Agents.....	478
• Cisplatin I.P., B.P., U.S.P. ....	480
6.8.8 Anti Depressants .....	481
• Lithium Carbonate I.P., B.P., U.S.P. ....	481
6.8.9 Antirheumatic Agents .....	483
• Sodium Aurothiomalate I.P., B.P., U.S.P. ....	483
6.8.10 Antithyroid Agents .....	484
• Potassium Perchlorate B.P., U.S.P.....	485
6.8.11 Surgical Aids .....	485
• Plaster of Paris (Gypsum) I.P., B.P.....	486
6.8.12 Diagnostic Agents.....	487
• Barium Sulphate I.P., B.P., U.S.P.....	487
• Barium Sulphate Compound Powder.....	489
6.8.13 Disinfectants .....	490
• Sulphur Dioxide U.S.P.....	490
<b>Probable Questions.....</b>	<b>491</b>

## CHAPTER 7

### RADIOPHARMACEUTICALS

7.1 Introduction .....	493
7.1.1 General Theory of Radioactivity .....	493
7.1.2 Radioactivity and Radiation.....	494
7.2 Methods for obtaining radioactive substances.....	499
7.2.1 Units of Radioactivity .....	501
7.3 Measurement of Radioactivity.....	501
7.3.1 Gas Ionization.....	502
7.3.2 Scintillation Counters .....	505
7.4 Official Radio Active Pharmaceuticals.....	507
• Cyanocobalamin ( <sup>57</sup> Co) (RCC/CT) .....	507
• Cyanocobalamin ( <sup>58</sup> Co).....	508
• Cyanocobalamin ( <sup>60</sup> Co).....	508
• Ferric Citrate ( <sup>59</sup> Fe) Injection (RCG/IFS 2P) .....	508
• Gold ( <sup>198</sup> Au) Injection B.P. (RCG/GCS 4P 2GGS1P) .....	509

• Sodium Chromate ( $^{51}\text{Cr}$ ) Solution I.P., B.P.....	510
• Sodium Iodide $^{131}\text{I}$ Solution B.P.....	510
• Sodium Iodide ( $^{131}\text{I}$ ) Injection B.P. ....	511
• Iodinated $^{125}\text{I}$ Human Serum Albumin B.P.....	511
• Sodium $^{125}\text{I}$ Serum Albumin U.S.P. ....	512
• Sodium Iodohippurate $^{131}\text{I}$ injections U.S.P. ....	512
• <i>o</i> -Iodohippuric acid $^{131}\text{I}$ Injection .....	512
• Sodium Rose Bengal $^{131}\text{I}$ Injection.....	513
• Rose Bengal $^{125}\text{I}$ Injection .....	513
• Chlormerodrin $^{197}\text{Hg}$ Injection U.S.P. ....	514
• Chlormerodrin $^{203}\text{Hg}$ Injection U.S.P. ....	514
• Sodium Phosphate $^{32}\text{P}$ Solution U.S.P.....	514
• Chromic Phosphate - 32 .....	515
• Technitium $^{99\text{m}}\text{Tc}$ Injection I.P. ....	515
• Indium - 113m.....	515
7.5 Storage and Handling of Radioactive Materials .....	517
7.6 Clinical Applications of Radio Pharmaceuticals .....	517
7.7 Radio Opaque Contrast Media.....	519
• Barium Sulphate I.P., B.P., U.S.P. ....	520
<b>Probable Questions.....</b>	<b>522</b>

## CHAPTER 8

### COORDINATION COMPOUNDS

8.1 Introduction .....	525
8.1.1 History of Coordination Chemistry .....	525
8.1.2 Terms used in Coordination Chemistry .....	526
8.2 Nomenclature of Coordination Compounds.....	528
8.2.1 Rules for the Nomenclature .....	528
8.3 Isomerism in Coordination Compounds.....	529
8.4 Coordination Compounds used in Pharmacy.....	532
• Ethylene Diamine Tetra Acetic Acid (EDTA) .....	532
• Disodium Edetate .....	533
• Disodium Edetate Injection.....	534



---

• Calcium Disodium Edetate.....	534
• Penicillamine.....	535
• Dimercaprol.....	536
• Calcium Folate.....	537
• 1,10-Phenanthroline.....	537
<b>Probable Questions.....</b>	<b>538</b>
<b>Suggested Readings.....</b>	<b>539</b>
<b>Index.....</b>	<b>541</b>