

Contents

<i>Dedication</i>	(v)
<i>Preface</i>	(vii)
<i>Acknowledgement</i>	(ix)
<i>About the Author</i>	(xi)
 PART – I	 1-80
 CHAPTER-1: ORIGIN AND GROWTH OF MATERIALS MANAGEMENT IN INDIAN HEALTHCARE INDUSTRY	 3-32
• Introduction	5
• Origin of Materials Management	5
• Evolution of Purchasing in Indian Industry	11
• Recent Trends in Materials Management in the Indian Context	12
• Supply Chain Management in the Cyber Age	15
• Evolution of Materials Management in the Healthcare Industry	15
• Hospital Materials Management at Present	16
• Future of Hospital Materials Management	17
• Impact of Information Technology	19
• Projections and Trends in Materials Management	21
• Healthcare Economics	24
• Strategies for Overcoming the Problems	27
• Future of Healthcare Industry	27
• Epilogue	28
• Summary	28
• Review Questions	31
 CHAPTER-2: INTEGRATED HOSPITAL MATERIALS MANAGEMENT	 33-54
• Introduction	35
• Materials Management (MM) - An Evolving Concept	36
• Functions of Materials Management	37



• Objectives of Materials Management	39
• Materials Management in Hospitals	41
• Advantages of Materials Management in Modern Hospitals	45
• Organizing Materials Management Functions in Hospitals	48
• Need for Integrated Concept	50
• Advantages of Integrated MM Concept	50
• Integrated Concept in HMM	51
• Summary	52
• • Review Questions	54

CHAPTER-3: MATERIALS MANAGEMENT IN HOSPITAL PHARMACY 55-80

• Introduction	57
• Functions.....	58
• Location	59
• Design	60
• Dispensing Area	61
• Manufacturing Area	61
• Administrative Area	61
• Storage Area	62
• Procurement	62
• Prime Vendor Agreements	63
• Competitive Bidding	64
• Inventory Control	65
• Distribution Management	66
• Outpatient Pharmacy	69
• Drug Utilization	70
• Drug Information	72
• Standardization and Treatment Protocols	72
• Drug Utilization Review	72
• Controlling Material Expenses	73
• Other Issues	77
• Summary	77
• Review Questions	80

PART - II	81-248
CHAPTER-4: PURCHASING FUNCTION, ORIGIN, SCOPE AND OBJECTIVES	83-102
• Introduction	85
• Origin and Growth of Purchasing Function	85
• Modern Concept of Purchasing	87
• Definitions of Purchasing	87
• Special Features of Hospital Purchasing	88
• Objectives and Scope of Purchasing	90
• Functions of Purchasing	91
• Responsibilities of Purchasing	94
• Role of Purchasing VIS-À-VIS Customers and Suppliers	96
• Cost Savings in Purchasing	98
• Summary	99
• Review Questions	100
CHAPTER-5: ORGANIZATION FOR PURCHASING FUNCTION	103-118
• Introduction	105
• Basic Concept of Organization	105
• Organization Structure	106
• Responsibilities, Authority and Accountability	108
• Centralized Versus Decentralized Purchasing	109
• Centralization Versus Decentralization in Terms of Supply Management	111
• Part Centralization and Part Decentralization	115
• Summary	115
• Review Questions	116
CHAPTER-6: PURCHASING CYCLE	119-140
• Introduction	121
• Purchasing Cycle	121
• Recognition of Need	123
• Bidding Process	127
• Purchase Requisition	129
• Bill of Material or Part List	130
• Budget	131



• Purchase Budget	132
• Purchase Plan	132
• Selecting the Alternatives	133
• Appraising Alternatives: Vendor Selection and Evaluation of Competitive Bids	133
• Negotiations	133
• Make or Buy Decisions	134
• Order Placement	136
• Follow up and Expediting	136
• Receiving and Inspection	136
• Checking and Payment of Supplier's Bills (Invoice Handling)	137
• Summary	137
• Review Questions	139

CHAPTER-7: PURCHASING PARAMETERS 141-164

• Introduction	143
• Right Quality	145
• Specifying Quality	145
• Writing a Specification	145
• Purchase Specification	146
• Brand Name	147
• Specifying by Catalogue Numbers	148
• Real Versus Apparent Quality	148
• Purchase Department's Role in Quality	149
• Vendor's Role in Quality	150
• Determination of Right Quantity	150
• Demand Forecasting	151
• Bill of Materials (BOM)	152
• Economic Order Quantity (EOQ)	152
• Materials Requirement Planning (MRP)	153
• Right Price	153
• Price Terms	153
• Payment Terms	154
• Premium Prices for Non Premium Products	157
• Right Time	158
• Right Source	159

• Investigation	160
• Summary	162
• Review Questions	164
CHAPTER-8: NEGOTIATIONS IN PURCHASING.....	165-202
• Introduction	167
• Definitions of Negotiation	168
• Purpose of Negotiation	169
• Erroneous Beliefs Associated with Negotiations	170
• Objectives of Negotiation	171
• Process and Techniques of Negotiation	171
• Analysis of Supplier Position	174
• Price Versus Cost Analysis	177
• Types of Relationships between Buyers and Sellers	180
• Possible Approaches to Negotiations	181
• Developing Strategy	183
• Do's and Don'ts of Negotiation	184
• Negotiation Process	186
• Negotiation Techniques	186
• Price Negotiations	189
• Other Factors that May Influence Price Negotiations	190
• Who Should Negotiate?	191
• Personal Abilities, Qualities and Attitude of a Good Buyer	192
• Practice for Negotiations	194
• Concluding the Agreement	195
• How to Negotiate Fixed Price?	195
• Negotiating a Price Increase	196
• Central Vigilance Guidelines for Public Buying in Hospitals	197
• Summary	198
• Review Questions	201
CHAPTER-9: HOSPITAL PURCHASING AND INDUSTRIAL PURCHASING - A COMPARISON.....	203-226
• Introduction	205
• Definition of Hospital and Healthcare Institution	206
• Differences in Hospital and Industrial Purchasing	206



• Control of Budgets	207
• Scope for Savings	207
• Challenging Specifications	208
• Inspections of Materials and Services	209
• Back Door Selling	210
• Reciprocity	212
• Personnel	213
• Organization	213
• Professional Loyalties	213
• Centralization of Purchasing	214
• Differences between Public and Private Healthcare Institutions	215
• Cooperative Buying	216
• Price Factor	217
• Auxiliary Functions	218
• Materials Management Problems in Healthcare Institutions	219
• Magnitude of Purchases	220
• Development of Purchasing in Healthcare Institutions	220
• Summary	221
• Review Questions	224

CHAPTER-10: SPECIAL FEATURES OF HOSPITAL PURCHASING..... 227-248

• Introduction	229
• Digital Medical Electronic Monitors	230
• Stretchers	232
• Linens	234
• Disposables and Reusables	236
• Pros and Cons of Disposables and Reusables	237
• Problems of Purchasing in Integrated MM Environment	240
• Back Door Selling and Buying	240
• Hospitals Should Share Prices	241
• Guidelines for Hospital Purchasing	242
• Group Purchasing	243
• Strategies for Group Success	245
• Summary	245
• Review Questions	247



PART - III..... 249-436

CHAPTER-11: SCOPE OF INVENTORY CONTROL AND ITS IMPACT ON PROFITABILITY 251-270

• Introduction	253
• Origin of Inventory	253
• Inventory Definition	254
• Inventory Control - Definitions	255
• Purpose of Holding Inventory	256
• Need for Inventory Control	256
• Inventory Control Clashing Objectives	256
• Basics of Inventory Management	257
• Pre Requisites for Inventory Reduction	257
• Impact of Inventory Control on Profitability	259
• Inventory Turnover	260
• Inventory System Improvement	261
• Impact of Official and Unofficial Inventory Investment per Bed	262
• Typical per-bed Inventory Levels in Indian Healthcare Industry	263
• Methodology for Arriving at the Inventory per Bed	264
• Interdepartmental Relationships	265
• Implementing Change	266
• Rx for Inventory Reduction	267
• Summary	269
• Review Questions	270

CHAPTER-12: CLASSIFICATION OF HOSPITAL INVENTORIES 271-298

• Introduction	273
• Inventory Classification based on Functions	273
• Classification of Hospital Inventories based on Usage and Point of Entry	274
• Expendables	274
• Unexpendables.....	281
• Spare Parts	285
• Classification of Spares	286
• Spare Parts Planning Pre Requisite	291
• Measures of Reliability	292



• Mean Time between Failures (MTBF)	292
• Summary	293
• Review Questions	297
CHAPTER-13: COST ASSOCIATED WITH INVENTORIES	299-324
• Introduction	301
• Ordering Cost/Set up Cost	302
• Inventory Carrying Cost	305
• Over Stocking Cost	307
• Under Stocking Cost or Out of Stock Cost	309
• Service Level	309
• Nature of Seasonality its Impact on Inventories	311
• Over Stock Cost for Products which have Seasonal Demand	312
• Obsolete Inventory.....	312
• Surplus.....	312
• Scrap	313
• Waste	313
• Limitations of Inventory Control.....	313
• Determination of Ordering and Carrying Costs.....	314
• Worked Out Problems	318
• Summary.....	320
• Review Questions	323
CHAPTER-14: ECONOMIC ORDER QUANTITY.....	325-352
• Introduction.....	327
• Supply and Demand.....	327
• Static Supply Situations.....	329
• Dynamic Supply Situations	330
• Relationship between Number of Orders and Inventory Held.....	331
• Derivation of Economic Order Quantity Formula	333
• Derivation of EOQ Formula Mathematically	334
• Assumptions made in EOQ Model	335
• Limitations or Practical Considerations in the Application of EOQ	336
• Reasons for Deviating From EOQ to Suit Real Life Situation.....	337
• Effect of Flatness in Total Cost Curve Near Minimum.....	338

• Cost Penalties for Departing from EOQ	338
• Examples of Cost Penalties for Departing from EOQ	338
• Other Uses of EOQ	339
• EOQ and Quantity Discounts	339
• Difficulties Faced by Organizations in Implementing EOQ System	340
• Making EOQ to Suit the Budget	341
• Worked Out Problems	346
• Summary	350
• Review Questions	351

CHAPTER-15: SELECTIVE CONTROLS OF INVENTORY 353-380

• Introduction.....	355
• Selective Inventory Control (SIC)	355
• Basis and uses of Different Types of Selective inventory Classifications.....	356
• ABC Analysis	357
• Methodology of ABC Classification	358
• Advantages of ABC Analysis	361
• Limitations of ABC Analysis	363
• HML Classification	363
• XYZ Classification	364
• VED Classification	364
• Application VED Classification to Spare parts Inventory	365
• Vital	365
• Essential	365
• Desirable	365
• Application VED Control Measures to Medical Store Inventories	366
• Fast, Slow and Non Moving (FSN) Classification	368
• Fast, Medium and Slow Moving (FMS) Analysis of Drugs	369
• Steps to be Taken Before Disposal of Non Moving Stores	369
• S.D.E Classification.....	371
• G.O.L.F. Classification	372
• Seasonal, Off Seasonal (S. O. S) Classification.....	372
• PQR Classification.....	373
• Worked Out Problems	373
• Summary	377
• Review Questions	378



CHAPTER-16: LEAD TIME MANAGEMENT	381-400
• Introduction.....	383
• Definitions	384
• Variations in Lead Time	385
• Effect of Long Lead Time on Costs and profitability	385
• Elements of Lead Time.....	386
• Classification of Lead Time.....	388
• Internal Lead Time	388
• External Lead Time	390
• Other Factors that Contribute to Higher Lead Time	392
• Lead Times Analysis	393
• Managing Lead Times	396
• Dealing with Inconsistent Lead Time	398
• Summary	398
• Review Questions	399
 CHAPTER-17: DESIGNING OF INVENTORY CONTROL SYSTEMS.....	 401-436
• Introduction.....	403
• Objectives of Inventory Control Systems.....	403
• Types of Control Systems.....	404
• Two Bin System	405
• Minima-Maxima Inventory Control System.....	406
• Imprest Stock Control.....	407
• Open access Bins System	408
• Fixation of Re order Point (ROP) or Re-order level (ROL)	408
• Determination of Safety Stock.....	411
• Practical Inventory Systems.....	414
• Perpetual Inventory System (Q system)	414
• Advantages of Q Model Inventory System.....	417
• Limitations of Q System of Inventory Control.....	417
• Periodic Inventory System (P System)	418
• Advantages of Periodic Inventory System.....	421
• Limitations of Periodic System.....	421
• Comparison of Q and P Systems of Inventory Models.....	423
• Materials Requirement Planning (MRP)	423

• Prerequisite Inputs for MRP	424
• MRP Output Reports	425
• Benefits of MRP	425
• Hospital Requirements Planning	426
• Inventory System Features.....	427
• Worked Out Problems	427
• Summary	432
• Review Questions	434
PART - IV	437-544
CHAPTER-18: STORES ORGANIZATION	439-456
• Introduction.....	441
• Stores Organization	441
• Centralised and Decentralised Stores	442
• Different Types of Stores in Hospitals	445
• Stores Organization in Hospitals	447
• Functions of Hospital Stores.....	447
• Planning of Hospital Stores	448
• Indenting of Stores in Government Hospitals.....	448
• Functions and Duties of a Stores Incharge	450
• Control of Stores.....	451
• Location of Stores.....	452
• Summary	453
• Review Questions	454
CHAPTER-19: STORES BUILDING AND STORES LAYOUT	457-478
• Introduction.....	459
• Stores Site Location.....	459
• Location of Hospital Stores	461
• Site Selection	461
• Stores Building	462
• Principles of Building Design.....	462
• Storage Facilities	463
• Stores Planning	464



• Planning the Layout.....	465
• Layout Design.....	467
• Different Forms for Layout Design	468
• Small Store Houses.....	471
• Inventory Location Systems	472
• Layout Design.....	473
• Pharmacy Stores Location and Layout	474
• Summary	474
• Review Questions	477
CHAPTER-20: PHYSICAL VERIFICATION OF INVENTORIES	479-494
• Introduction.....	481
• Purpose of Physical Inventory Taking.....	482
• How to Conduct Stock Verification.....	482
• Emergency Stock Receipt and Requisitions	486
• Cross check and Verification	486
• Methods of Stock Taking.....	487
• Comparison among three Most Popular Methods of Stock Taking.....	489
• Investigation into Discrepancies, Reconciliation, Stock Adjustment and Write offs	490
• Summary	492
• Review Questions	493
CHAPTER-21: INVENTORY VALUATION.....	495-520
• Introduction.....	497
• Need for Valuation of Inventory.....	497
• Valuation of Incoming Materials.....	498
• Unique Features of Hospitals Inventory Valuation	502
• Methods of valuation Materials Issues	503
• Summary	515
• Review Questions	517
CHAPTER-22: SUPPLY AND DISTRIBUTION MANAGEMENT.....	521-544
• Introduction.....	523
• Optimization of Storage Space	523



• Supply and Internal Distribution.....	524
• Planning of Facilities	525
• Basic Distribution Options.....	527
• Stockless Inventory.....	528
• Par Level System	530
• Exchange Cart System	532
• Other Related Factors	534
• Maintenance of Records	535
• Evaluation of Existing and Proposed Distribution Systems	535
• Operational Issues.....	537
• Cart System for Operation Theatre Stores.....	539
• Summary.....	542
• Review Questions	544
PART-V	545-624
CHAPTER-23: VALUE ANALYSIS/VALUE ENGINEERING (VAVE)	547-576
• Introduction.....	549
• What is Value Analysis? (VA)	549
• Value Engineering Versus Value Analysis (VAVE).....	551
• Definitions of Value Analysis.....	551
• Origin of Value Analysis	552
• Basic Features of Value Engineering.....	553
• Value Analysis in Healthcare industry in the Indian Context.....	559
• Importance of Value Analysis as a Cost Reduction Technique.....	559
• Causes of Unnecessary Costs	560
• Types of Value.....	563
• Constituents of Economic Value	563
• Methods to Improve Economic Value	565
• Techniques of Value Analysis or Check list Approach.....	566
• Essence of Value Analysis/MISS Concept.....	571
• Summary.....	573
• Review Questions	575



CHAPTER-24: SUPPLY CHAIN MANAGEMENT RELEVANCE TO HEALTHCARE INDUSTRY 577-606

• Introduction.....	579
• What is a Supply Chain Management?.....	580
• Supply Chain Management (SCM) Definition	581
• Evolution of SCM in Indian Industry	581
• Concept of SCM	582
• Components of Supply Chain Management	582
• Importance of SCM	583
• Objectives of SCM	583
• SCM Role of Various Functions.....	584
• SCM Basic Framework.....	585
• Supply Chain Integration	587
• SCM Thrust Areas	587
• Supply Chain Strategy	589
• Efficient Vs Responsive Supply Chain.....	590
• Role of Material Managers in SCM.....	591
• SCM and Information Technology	592
• SCM Future Trends	592
• Supply Chain in Healthcare Business	593
• Differentiation between Manufacturing and Hospital Supply Chain.....	593
• Various Flows in Hospital Supply Chains	594
• Contextual View of Corporate Hospitals at Apex Level	597
• Standard Supply Chain practices in Hospitals	598
• Obstacles to Implement SCM.....	601
• SCM is Teamwork	602
• Summary.....	603
• Review Questions	606

CHAPTER-25: INFORMATION TECHNOLOGY (IT) APPLICATIONS IN HEALTHCARE 607-624

• Introduction.....	609
• E-health Solutions.....	609
• Materials Management Information Systems (MMIS).....	609
• Distribution Oriented Vs Storage Oriented.....	611



• Data retrieval Vs Document retrieval	612
• Centralized Vs Decentralized MMIS.....	612
• Scalability	613
• MMIS Reports	613
• Planning an MMIS Project	615
• Steps in Planning	616
• MMIS Design	618
• System Documentation	619
• Switchover to Computer Aided Systems	619
• Interaction with MMIS	620
• MMIS Benefits	621
• Summary	621
• Review Questions	623
<i>BIBLIOGRAPHY</i>.....	625-638
<i>GLOSSARY</i>	639-696
<i>INDEX</i>.....	697-706
<i>AUTHOR INDEX</i>	707-708
<i>ORGANIZATION INDEX</i>.....	709-710