

Contents

Chapter 1 Introduction

1.1	Meaning and Definition	1
	<i>Operations Management in Organization Chart</i>	2
	<i>Objectives of Operations Management</i>	3
	<i>Functions of Operations Management</i>	3
1.2	Operations System and Its Environment	4
1.3	Operations System and Its Objective	6
	<i>Manufacturing Operations and Service Operations ...</i>	6
1.4	Productivity and Competitiveness	7
1.5	Types of Productivity	8
1.6	Historical Development of Production and Operations Management	9
1.7	Strategic Competitive Priorities of Operations Management	10
	<i>Questions</i>	12

Chapter 2 Manufacturing Environment

2.1	Product Design	13
	<i>Importance of Product Design</i>	15
	<i>Objectives of Product Design</i>	15
	<i>Approaches and Concepts to Product Design</i>	15
2.2	Operational Issues in Various Stages of Product Life Cycle	21
	<i>Product Development Process</i>	21
2.3	Frequency of Decision Changes	23
2.4	Designing Products for Manufacture and Assembly	24
2.5	Process Selection	25
	<i>Process Life Cycle</i>	29
	<i>Product Process Mix</i>	29
2.6	Automation	30
	<i>Automated Assembly Systems</i>	31
	<i>Automation Issues</i>	32

<i>Advantages and Disadvantages of Automation</i>	32
2.7 Process Flow Design	33
Questions	35

Chapter 3 Service Environment

3.1 Meaning and Nature of Service	36
3.2 Importance of Well- Designed Service System	37
<i>Service Issues</i>	38
3.3 Classification of Services	39
3.4 Designing Service Organization	40
3.5 Service-System Design Matrix (Service Processes)	41
3.6 Service Blueprinting	42
3.7 Service Guarantees	44
3.8 Emerging Issues (or Challenges) in Product and Service Design	44
Questions	46

Chapter 4 Supply Chain Management

4.1 Supply Chain Strategy	47
4.2 Objectives of a Supply Chain Strategy	49
4.3 The Need for Supply Chain Management	50
4.4 Supply Chain Design Strategy	51
4.5 Outsourcing	54
<i>Advantages and Disadvantages of Outsourcing</i>	55
4.6 Mass Customization	56
Questions	57

Chapter 5 Forecasting

5.1 Introduction	58
5.2 Definition of Forecasting	60
5.3 Features of Forecast	60
5.4 Elements of a Good Forecast	61
5.5 Steps in Forecasting Process	61

5.6	Approaches to Forecasting	62
	<i>Forecasts Based on Judgment and Opinion</i>	62
	<i>Forecasts Based on Time Series Data</i>	64
	<i>Naïve Approach</i>	66
	<i>Techniques of Averaging</i>	66
5.7	Techniques for Trend	71
5.8	Techniques for Seasonality	74
	<i>Using Seasonal Relatives</i>	76
	<i>Computing Seasonal Relatives</i>	76
5.9	Techniques for Cycles	77
	<i>Associative Forecasting Techniques</i>	77
5.10	Accuracy and Control of Forecasts	78
5.11	Summarizing Forecast Accuracy	78
5.12	Controlling the Forecast	79
	<i>Questions</i>	80

Chapter 6 Capacity Planning

6.1	Concept of Capacity Planning	85
	<i>Design Capacity</i>	85
	<i>Effective Capacity</i>	85
6.2	Capacity Planning Decision	86
	<i>Importance of Capacity Planning</i>	87
	<i>Capacity Planning Process</i>	87
	<i>Questions</i>	90

Chapter 7 Aggregate Sales and Operation Planning

7.1	Overview of Sales and Operations Planning Activities	91
7.2	Aggregate Operations Plan	93
	<i>Objectives of Aggregate Operations Plan</i>	95
	<i>Importance of the Aggregate Operation Plan</i>	95
7.3	Aggregate Planning Process	96
7.4	Master Production Schedule (MPS)	98
7.5	Rough Cut Capacity Planning (RCCP)	99

7.6	Scheduling and Control Process	100
	<i>Loading</i>	100
	<i>Priority Sequencing</i>	106
	<i>Detailed Scheduling</i>	107
	<i>Expediting</i>	108
	<i>Input/Output Control</i>	108
7.7	The Aggregate Planning Techniques	109
	<i>Trial-and-Error Techniques Using Graphs and</i>	
	<i>Spreadsheets</i>	109
	<i>Mathematical Techniques</i>	115
7.8	Yield Management	117
	<i>Questions</i>	119

Chapter 8 Inventory Systems

8.1	Concept	120
	<i>Meaning of Inventory</i>	120
	<i>Purpose of Inventory</i>	121
8.2	Inventory Costs	121
8.3	Dependent vs. Independent Demand	121
8.4	Inventory System	122
8.5	Basic Economic Order Quantity Models	124
	<i>Simple Economic Order Quantity</i>	124
	<i>Economic Order Quantity with Discount</i>	125
	<i>Economic Order Quantity with No Shortage</i>	127
	<i>Economic Order Quantity with Constant Demand</i>	127
	<i>Economic Order Quantity with Different Rates of</i>	
	<i>Demand</i>	129
	<i>Economic Order Quantity with Finite Replenish (Supply)</i>	
	<i>Rate</i>	130
	<i>Economic Order Quantity with Shortage</i>	131
8.6	Reorder Point	133
8.7	Material Requirement Planning System (MRP)	134
	<i>Meaning and Purpose of MRP</i>	134
	<i>Advantages and Disadvantages of MRP</i>	134
	<i>Materials Requirement Planning System Structure</i> ...	135

<i>MRP Inputs</i>	136
<i>MRP Processing</i>	137
<i>MRP Output Reports</i>	138
<i>Questions</i>	141
<i>Exercise</i>	142

Chapter 9 Japanese Operation Management

9.1 Overviews of Japanese Management	147
<i>Japanese Management Style</i>	148
<i>Drawbacks of Japanese Management</i>	148
9.2 Just In Time Philosophy	149
<i>Introduction</i>	149
<i>Two Philosophy of JIT</i>	150
<i>JIT Implementation Requirements</i>	152
<i>Advantages and Disadvantages of JIT</i>	153
9.3 Kanban System	154
9.4 KAIZEN System	155
9.5 Flexible Manufacturing System Dynamics (FMS)	158
<i>Introduction</i>	158
<i>Characteristics of FMS</i>	158
<i>Advantages and Disadvantages of FMS</i>	158
<i>FMS Dynamic</i>	159
<i>Questions</i>	160

Chapter 10 Waiting Line Theory

10.1 Introduction	161
10.2 Definition and Objectives of Waiting Line Theory	162
10.3 Basic Terms	162
10.4 Problems Involving in Waiting Line Theory	163
10.5 Waiting System and its Essential Elements	164
10.6 Operating Characteristics of Waiting System	171
10.7 Types of Queuing Systems	171
<i>Single Channel System</i>	172
10.8 Notations Used in a Queuing System	172

10.9 Different Models (formulae) of Queuing System (Single Channel System)	173
<i>Exercise</i>	182

Chapter 11 Total Quality Management

11.1 Introduction	186
11.2 Philosophical Elements	187
11.3 Cost of Quality	188
<i>Cost of Prevention</i>	189
<i>Cost of Appraisal</i>	190
<i>Cost of Failure</i>	190
11.4 Process Control Procedure	191
11.5 Statistical Quality Control (SQC)	192
<i>Objectives of Statistical Quality Control</i>	192
<i>Classification of SQC</i>	193
11.6 Control Charts	194
<i>Types of Control Charts</i>	196
<i>Construction of Control Chart for Variables</i>	196
$\bar{x}$ and R Charts	197
<i>Control Charts for Attributes</i>	205
11.7 Acceptance Quality Level (AQL)	214
<i>Acceptance Sampling</i>	215
11.8 Producer's and Consumer's Risk	218
11.9 Operating Characteristic Curve	219
<i>Construction of OC Curve by Poisson Distribution</i> ...	220
<i>ISO 9000</i>	222
<i>Contents of ISO 9000</i>	223
<i>Benefits from ISO 9000</i>	225
<i>Questions</i>	226
<i>Exercise</i>	227

Appendices	231
Bibliography	234