

## **CONTENTS**

<b>Declaration of Authorship</b>	i
<b>Certificate</b>	ii
<b>Acknowledgement</b>	iii
<b>Preface</b>	v
<b>Symbols</b>	viii
<b>Chapter-1: Introduction and Literature Review</b>	<b>1</b>
1.1 Introduction	2
1.2 Scheduling Problem	6
1.3 Machine Environment	9
1.4 Scheduling Terminology	11
1.5 Assumptions	15
1.6 Objectives of Scheduling	16
1.7 Significance of Scheduling	17
1.8 Single Machine Scheduling Problem	18
1.9 Parallel Machine Scheduling	19
1.10 Flow Shop Scheduling	20
1.11 Job Shop Scheduling	23
1.12 Dispatching Rules	25
1.13 Organization of the Thesis	28
1.14 References	31
<b>Chapter-2: Multi-Jobs in Single Machine Scheduling                   Problem with Non-Linear Deteriorated and                   Time-Dependent Learning</b>	  <b>39</b>
2.1 Introduction	40

2.2 Minimum Total Completion Time	42
2.3 Formulations of the Problem	43
2.4 Some Single Machine Scheduling Problems	45
2.5 Counter Example	55
2.6 Conclusion	59
2.7 References	60

**Chapter-3: Maintenance Activity Single-Machines  
Scheduling and Due-Date Assignment  
Simultaneously**

3.1 Introduction	62
3.2 Maintenance Activity	66
3.3 Preliminary Results	68
3.4 Formulations of the Problem	69
3.5 Optimal Solution	75
3.6 Special Cases	78
3.7 Counter Example	81
3.8 Conclusion	83
3.9 References	84

**Chapter-4: Common Due-Date Assignment and Job  
Scheduling on Single Machine and Parallel  
Machines**

4.1 Introduction	87
4.2 Formulations of the Problem	90
4.3 Preliminary Analysis	91
4.4 Single-Machine	95
4.5 Numerical Example	97

4.6 Parallel-Machine	97
4.7 Heuristic Solution	100
4.8 Optimal Solution	102
4.9 Conclusion	103
4.10 References	104

**Chapter-5: Assignment Problem Heuristic Algorithm to  
Minimize Makespan on Non-Identical  
Parallel Machines** **106**

5.1 Introduction	107
5.2 Previous Results	109
5.3 Minimizing Total Absolute Deviation from a Common Due-Date	112
5.4 Analysis of the Proposed Model	113
5.5 Scheduling Non-Identical Parallel Machines	116
5.6 A Numerical Example	120
5.7 Conclusion	122
5.8 References	123

**Chapter-6: A Note on Flow Shop Scheduling Problem with  
Increasing and Decreasing Linear Deterioration  
on Weighted Dominant Machines** **125**

6.1 Introduction	126
6.2 Flow Shop Scheduling	131
6.3 Formulations of the Problem	132
6.4 Minimize the Total Weighted Completion Time	134
6.5 Conclusion	139
6.6 References	140

<b>Chapter-7: Comparative Study of Dispatching Rule for Job Shop Scheduling Problem</b>	<b>142</b>
7.1 Introduction	143
7.2 Problem in Dispatching Rule	147
7.3 Job Based Assumptions	148
7.4 Machine Based Assumptions	149
7.5 Dynamic Job Shop	149
7.6 Experimental Conditions	151
7.7 Run Length and Number of Replications	152
7.8 Comparison of Results	152
7.9 Conclusion	155
7.10 References	156
<b>Appendix A</b>	<b>158</b>