PREFACE

This Thesis **"Some Contribution of Scheduling Problem in Operations Research"** comprises seven chapters and contains the study of Scheduling Problems.

Chapter-1

This is an introductory chapter, it contains, introduction, historical survey of the literature based on topic.

Chapter-2

Multi-Jobs in Single Machine Scheduling Problem with Non-Linear Deteriorated and Time-Dependent Learning

In this chapter, we study the multi-jobs single machine scheduling problem under the effect of nonlinear job deterioration and time-dependent. The single machine scheduling problem with non-linear deterioration learning and present the complexity results concerning time dependent scheduling on a single machine. Also present the results concerning a single machine and minimization of the $C_{\max}$, $\sum C_j$ and $L_{\max}$ criterion. We assume that the processing time of a job increases when it's processing is delayed. The objectives are considered: the makespan, the sum of completion times (square) and the minimum lateness. Computational results are compared on sequencing and SPT rule with counter examples and shown graphically.

Chapter-3

Maintenance Activity Single-Machines Scheduling and Due-Date Assignment Simultaneously

This chapter, present work deals with analysis maintenance activity single-machine scheduling and due-date assignment simultaneously. The objective is to find the optimal maintenance position as well as the optimal location of the common due-date for minimizing the total of earliness, tardiness and due-date costs. We

introduce a polynomial $0(n^4)$ time solution for the problem. To solve the scheduling problem addressed in this work, we have to determine the job sequence, the common due-date, and the location of a maintenance activity. We also present two special cases of the problem and show that they can be optimally solved by a lower order algorithm.

Chapter-4

Common Due-Date Assignment and Job Scheduling on Single Machine and Parallel Machines

In this chapter we consider a total penalty for the n job, one machine scheduling problem in which all jobs have a common due date. This penalty function is based on the due date value and on the earliness or the lateness of each job in the selected sequence. The main objective is to determine the optimal value of this due date and an optimal sequence to minimize a total penalty function. We prove that the optimal due date result can be generalized to the parallel machine problem. The problem of simultaneously available jobs on several parallel and identical machines. The problem is to find the optimal due date, assuming this to be the same for all jobs and we present a simple heuristic to find an approximate solution. On the basis of a limited experiment, we observe that the heuristic is very effective solution.

Chapter-5

Assignment Problem Heuristic Algorithm to Minimize Makespan on Non-identical Parallel Machines

In this chapter we consider the problem of scheduling n single operation jobs with a common due date on m parallel machines so as to minimize the sum of the absolute lateness. In this case of non-identical machines we reduced the problem to a transportation problem that can be solved by a polynomial time algorithm. Furthermore we have given assignment problem heuristic algorithm to minimize makespan among all schedules that minimize the absolute lateness problem and to find the value of processing time and due date.

Chapter-6

A Note on Flow Shop Scheduling Problem with Increasing and Decreasing Linear Deterioration on Weighted Dominant Machines

This chapter deals with the study the flow shop scheduling problem with increasing and decreasing linear deterioration on weighted dominant machines and also deal with some special case of general, no-wait permutation flow shop scheduling problem, respectively. Special cases mean that the machines form an increasing series of dominant machines, and decreasing series of dominant machines. The objectives are to minimize one of the two regular performance criteria, namely, makespan, total completion time and weighted completion time. This objective is considered under following dominant machine constraint: idm and ddm are considered. Numerical examples of the solution approaches are provided.

Chapter-7

Comparative Study of Dispatching Rule for Job Shop Scheduling Problem

This chapter consists of a comparative study on the performance of dispatching rule for job shop scheduling problems with weighted tardiness objectives including the tardy rate and maximum tardiness. The focused approach is the dispatching rules. Some dispatching ruled are selected form the literature, and their features and design concepts are discussed. The chapter has two objectives. The first is to discuss the state of the art in the study of dispatching rules. The discussion includes analytical approaches, simulation techniques and evaluation criteria. The second objective of the chapter is to compare several of the dispatching rules listed in the Appendix using the results of recently published studies.