Abstract

Lot sizing and scheduling in flow shop has been considered in this paper. Our study includes a multi-level and multi-period capacitated lot sizing and scheduling problem (CLSP) with sequence-dependent setups, setups carry over in flow shop. In manufacturing environments backlogging is unavoidable. If the production capacity is infinite, any demand can be satisfied
on time. But in the real world, production capacity is not infinite so some demand may not be satisfied on time. In this condition backlogging arises naturally. CLSP problems with considering backlogging has been studied fewer by researchers. Also, the sequence-dependent setups and setups carry over are two important events that occur occasionally in factories. In this study an exact mixed integer problem (MIP) in a flow shop CLSP problem with considering sequence-dependent setups, setups carry over and backlogging has been formulated. Our formulation is presented to optimize objective function (including, inventory costs, product costs and setup cost). Since the CLSP problems are extremely NP-hard a lower bound is developed and compared against the optimal solution.

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**Index Terms**

Computer Science

Operations Research

**Key words**

Flow shop  sequence-dependent setups
backlogging

lot sizing

scheduling