

An Extended Basic Period and Power-of-Two Policy for Economic Lot-Size Batch-Shipment Scheduling Problem

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Abstract : In this study, we consider an economic lot-size batch-shipment scheduling problem (ELBSP) with extended basic period (EBP) and power-of-two (PoT) policies. In this problem, the supplier using a single facility to manufacture multiple products and equally sized batches are then delivered by the supplier to buyers over an infinite planning horizon. Further, the extended basic period (EBP) and power-of-two (PoT) policy are utilized. Relaxing the production schedule converts the ELBSP to an economic lot-size batch-shipment problem (ELBP) with EBP and PoT policies, and a nonlinear integer programming model of the ELBP is constructed. Using the replenishment cycle division and recursive tightening methods, optimal solutions are then solved separately for each product. The sum of these optimal solutions is the lower bound of the ELBSP. A proposed heuristic method with polynomial complexity is then applied to figure out the near-optimal solutions of the ELBSP. Numerical example is presented to confirm the efficacy of the proposed method.

Keywords : economic lot-size scheduling problem, extended basic period, replenishment cycle division, recursive tightening, power-of-two

Conference Title : ICEET 2017 : International Conference on Electrical Engineering and Technology

Conference Location : Tokyo, Japan

Conference Dates : May 28-29, 2017