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Abstract:
In this paper, a generalized mathematical model formulation for cellular manufacturing system (CMS) using hierarchical production planning (HPP) approach is proposed. The model is applied to two different real case studies and is solved by using operation research optimization software (Lingo (١٢.٠) program). The model is divided into three main steps as follows: data collection, mathematical model formula, and results. The proposed mathematical model of the optimization can solve the problems of the system under utilizing the limited resources in a production plan. The results show that the proposed mathematical model can be used to minimize manufacturing total costs of products for similar cases. To prove the work, two case studies are introduced; for the first case (electric water heater with capacity ٥٠ liter (EWH١)), the results show that the total cost decreases by ٨.٤٦ % for the optimum conditions. For the second case, (electric water heater with capacity ٨٠ liter (EWH٢)), as global results, the total cost decreases by ٣.٧% for the optimum conditions.