SOLVING CELL FORMATION PROBLEM BY SIMULATED ANNEALING

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ABSTRACT

CELLULAR MANUFACTURING SYSTEM (CMS) IS AN APPLICATION OF GROUP TECHNOLOGY (GT). BECAUSE OF ITS ADVANTAGE OF SAMPLING MANUFACTURING PROCESSES, REDUCING LEAD TIME, MATERIAL HANDLE AND QUALITY PROBLEMS, THIS PROBLEM ATTRACTS ATTENTION FROM PRACTITIONERS AND RESEARCHERS. CELL FORMATION IS ONE OF THE MOST IMPORTANT PROBLEMS DURING THE CMS. DUE TO ITS NP-COMPLETE CHARACTERISTICS,IT IS DIFFICULT TO OBTAIN OPTIMAL CELL FORMATION IN AN ACCEPTABLE TIME,ESPE -CIALLY FOR PROBLEMS WITH LARGE SCALES. THE PRIMARY PURPOSE OF THIS RESEARCH IS TO PROPOSE HEURISTIC METHODS TO SOLVE THE PROBLEM IN AN EFFICIENT MANNER. A SIMULATED ANNEALING-BASED HEURISTIC ALGORITHM IS PRESENTED TO SOLVE THE PROBLEM. REGARDING THE OBJECTIVE FUNCTION OF THIS STUDY, AN INDEX NAMED GROUPING EFFICACY CONCERNING BOTH MINIMIZING TOTAL TRANSPORTATION COST AND MAXIMIZING CELLULAR UTILIZATION IS ADOPTED.COMPUTATIONAL RESULTS OBTAINED FROM THE COMPARISON WITH THOSE FROM THE LITERATURE SHOW THE EFFICIENCY AND EFFICACY OF THE PROPOSED ALGORITHM.

Keywords : GROUP TECHNOLOGY, CELL FORMATION, SIMULATED ANNEALING,GROUPING EFFICACY

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