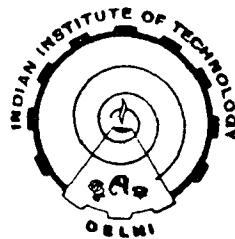


**SOME STUDIES IN MULTIOBJECTIVE OPTIMIZATION OF
PRODUCTION PLANNING PROBLEMS IN FLEXIBLE
MANUFACTURING SYSTEMS**

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by
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CERTIFICATE

The thesis entitled "Some studies in multiobjective optimization of planning problems of flexible manufacturing systems" being submitted by Mr. Prevendra Kumar to the Indian Institute of Technology, Delhi, for the award of the Degree of Doctor of Philosophy, is a record of bonafide research carried out by him. He has worked under our guidance and supervision and has fulfilled the requirements for the submission of this thesis, which has attained the standard required for a Ph.D. degree of this Institute. This work has not been submitted elsewhere for the award of any degree or diploma.

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Pkumar
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ABSTRACT

This study is concerned with certain production planning problems associated with flexible manufacturing systems. In particular, the grouping and loading problems are analysed under the light of multiple objectives. The loading problem is formulated as a multiobjective programming model for which min-max solution is obtained. A clustering technique is used to reduce the size of Pareto optimal set generated in finding the min-max solution of the loading problem. A nonlinear goal programming model is developed for the loading problem. A sequential search approach is used to obtain the solution with due consideration of target values and priority structure specified by the decision maker. The complete enumeration approach is used for generating the pareto optimal solution set and finding an optimal solution to the multiobjective formulations of the loading problem. A particular example is used to illustrate the application of the models developed.

The grouping and loading problems are considered as a combined problem for which multistage multiobjective model is developed. The min-max approach is used to obtain a compromise solution. A nonlinear goal programming model

is developed for the combined problem of grouping and loading for which a solution algorithm is developed. The model formulation and computational aspects are illustrated using an example problem.

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