TRANSPORTATION PROBLEMS WITH MINIMAX CRITERION

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The minimax is studied in many fields. For example in game theory, it is the inevitable minimal loss. The minimax is used in this paper for the transportation problems. The expenditure for the transports of a homogeneous product from the production points to the consumption ones is minimized in the classical transportation problem. Suppose that the transport time is proportional to the product quantity. If the product goes bad (agriculture) then it is neseccary to minimize the maximal transport time. We obtain the following problem: to find the matrix with the fixed sums of the lines and columns where its maximal element would be minimal. The condition for the set of the transportation problem matrixes is offered when this set contains matrixes where their elements are not more than a fixed value. The identity is designed which determines properties of all matrixes of the transportation problem with bounded elements. Above condition and identity give the matrix when its maximal element is minimal as well as calculate the minimax value. The necessary and sufficient conditions of the uniqneness of the minimax matrix are obtained. The case of the integer solution is investigated in detail. The approach is enlarged for the many indexes transportation problems too.