

LCEM and Reciprocal LCEM Matrices

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Let $T = \{x_1, x_2, x_3, \dots, x_n\}$ be an ordered set of positive integers greater than 1. The $n \times n$ matrix $[T]_{(e)} = (t_{ij})_{(e)}$ having $t_{ij} = [x_i, x_j]_{(e)}$ as its ij^{th} entry is called LCEM matrix on T , where $[x_i, x_j]_{(e)}$ is the least common exponential multiple of x_i and x_j . It is easy to see that LCEM matrices are symmetric. We always assume that $x_1 < x_2 < x_3 < \dots < x_n$. In this paper the structural theorems for LCEM and reciprocal LCEM matrices have been determined explicitly and also calculated their determinants. The inverses of LCEM and reciprocal LCEM matrices on exponential divisor closed sets have also been determined.

Keywords: LCEM matrix, reciprocal LCEM matrix, exponential divisor, exponential divisor closed set, arithmetic function