Abstract

The line graph, 1-quasitotal graph and 2-quasitotal graph are well-known. It is proved that if G is a graph consist of exactly m connected components \( G_i \), \( 1 \leq i \leq m \), then \( L(G) = L(G_1) \oplus L(G_2) \oplus \ldots \oplus L(G_m) \) where \( L(G) \) denotes the line graph of \( G \), and \( \oplus \) denotes the ring sum operation on graphs. The number of connected components in \( G \) is equal to the number of connected components in \( L(G) \) and also if \( G \) is a cycle of length \( n \), then \( L(G) \) is also a cycle of length \( n \). The concept of 1-quasitotal graph is introduced and obtained that \( Q_1(G) = G \oplus L(G) \) where \( Q_1(G) \) denotes 1-quasitotal graph of a given graph \( G \). It is also proved that for a 2-quasitotal graph of \( G \), the two conditions (i) \( |E(G)| = 1 \); and (ii) \( Q_2(G) \) contains unique triangle are equivalent.
Line Graphs and Quasi-Total Graphs

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Index Terms

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