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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