SUBSWITCHING NUMBER OF A GRAPH

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Abstract

Let G(V, E) be a graph. A vertex v∈V(G) is said to be a self vertex switching of G, if G is isomorphic to G^v, where G^v is the graph obtained from G, by deleting all edges of G incident to v and adding edges between v and the vertices which are not adjacent to v in G. A vertex v is called a subswitching vertex of a graph G if G is isomorphic to a subgraph of G^v. The subswitching number on a graph is the number of subswitching vertices in G. In this paper, we introduce this concept and find subswitching number of some standard graphs.

Keywords switching, self vertex switching, subswitching, subswitching number
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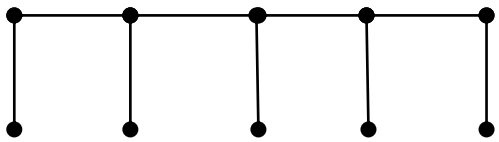
1 Introduction

Throughout this paper, we consider only finite, simple, undirected graph. For notations and terminology, we refer [4]. The degree of a vertex v_i is denoted by $d(v_i)$. The comb is a graph obtained by joining a single pendant edge to each vertex of a path and its denoted by $P_n{}^oK_1$. The graph $P_5{}^oK_1$ is shown in Figure 1.1.



$P_5{}^oK_1$

Figure 1.1

A subdivision of an edge $e= uv$ of a graph G is obtained by deleting uv and then by introducing a new vertex w, and two new edges uw and vw. If each edge of the star graph $K_{1,n}$ is subdivided exactly once, then the resultant graph is called the spider graph and it is denoted by $S_1(K_{1,n})$.

The switching concept was introduced by Seidel [8]. For a graph $G(V,E)$ and a subset S of V, the *switching* of G by S is defined as the graph $G^S(V,E)$, which is obtained from G, by removing all edges between S and its complement $V\backslash S$ and adding edges between S and $V\backslash S$ which are not in G. For example, a graph G with $S= \{v_1, v_2\}$ and G^S is shown in Figure 1.2.