VERTEX CUT SPLITTING GRAPHS

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Abstract

Let G(V,E) be a simple and undirected graph. For a graph G, the splitting graph S(G), is obtained by adding a new vertex v' corresponding to each vertex v of G and joining v' to all vertices which are adjacent to v in G. Here, we introduce a new type of splitting graph called vertex cut splitting graph and we define it as follows: Let G be a graph and $S_1,S_2,S_3,\ldots,S_\alpha$ be the minimum vertex cuts in G. The vertex cut splitting graph VS(G) of a graph G is the graph obtained from G by adding new vertices $w_1,w_2,w_3,\ldots,w_\alpha$ and joining w_i to each vertex in S_i where $1 \leq i \leq \alpha$. In this paper, we establish some results on vertex cut splitting graphs.

Keywords : *splitting graph, vertex cut , vertex cut splitting graph, minimum vertex cut splitting graph.*

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1. INTRODUCTION

Throughout this paper, we consider only finite, simple and undirected graphs. For notations and terminology, we refer [4]. Let *G(V,E)* be any graph. A graph with *n* vertices and *m* edges is denoted by *(n,m)-graph*. A *cycle* of length *n* is denoted by C_n where as P_n denotes a *path* on *n* vertices. The *complete graph* on *n* vertices is denoted by K_n. The *complete bipartite* graph is denoted by $K_{n,m}$. In a graph G, *degree* of a vertex *v* is denoted by *d(v).*

A *full vertex* is a vertex *v* in *G* which is adjacent to all other vertices of *G*. A graph *G* is said to be *r-regular*, if every vertex of *G* has degree r. For any two integers *x* and y, $x \neq y$, a *(x,y)- biregular* graph is a graph in which every vertex is of degree either *x* or *y*. A *unicyclic* graph is a graph it contains exactly one cycle.

For any two vertices *u* and *v*, the *distance d(u,v)* in *G* is the length of a shortest path between *u* and *v*. The *diameter* of G is defined as $max\{d(u,v)/\ u,v \in V(G)\}$ and is denoted by *diam G*. The *eccentricity* of *u* is denoted by *e(u)* and defined by $e(v)= max\{d(u,v)/\ v \in V(G)\}$. The *radius* of *G*, *r(G)* is the minimum eccentricity of *G*. A vertex *v* of *G* is called a *central vertex*, if $e(v)= r(G)$. The set of all central vertices is called the *center* of *G*. Let $G \vee H$ denote the join of two graphs *G* and *H*. Note that $C_n \vee K_1$ is the *wheel* graph.