1118-05-97 **M Jaradat*** (mmjst4@qu.edu.qa), Department of mathematics, Statistics and phy, Doha, Qatar.
On the basis number and the minimum cycle bases of the Lexicographic product of graphs.

For a graph G, let $e_1, e_2, \ldots, e_{|E(G)|}$ be an ordering of its edges. Then a subset S of $E(G)$ corresponds to a $(0,1)$-vector $(b_1, b_2, \ldots, b_{|E(G)|})$ in the usual way with $b_i = 1$ if $e_i \in S$, and $b_i = 0$ if $e_i \notin S$. These vectors form an $|E(G)|$-dimensional vector space, denoted by $(Z_2)^{|E(G)|}$, over the field of integers modulo 2. The vectors in $(Z_2)^{|E(G)|}$ which correspond to the cycles in G generate a subspace called the cycle space of G denoted by $\mathcal{C}(G)$. The *basis number*, $b(G)$, of G is the least non-negative integer d such that each edge of G appears in at most d edges of the basis. A basis $\mathcal{B}$ is called *a minimum cycle basis* if its total length is minimum among all bases of $\mathcal{C}(G)$. The Lexicographic product $G[H]$ of two graphs G and H is the graph with vertex set is$V(G) \times V(H)$ and the edge set is $\{(u_1, v_1)(u_2, v_2) | u_1u_2 \in E(G)$ or $u_1 = u_2$ and $v_1v_2 \in E(H)\}$. In this work, we give an upper bound of the basis number and construct a minimum cycle bases of the lexicographic product of graphs. Further, we give examples to show that the upper bound is optimal. (Received January 26, 2016)