Dissertation Defense

On K_t-Saturated Graphs

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Abstract: Let G be a graph on n vertices. Let H be a graph. Any H-free graph G is called H-saturated if the addition of any edge $e \notin E(G)$ results in H as a subgraph of G. The minimum size of an H-saturated graph on n vertices is denoted by $sat(n, H)$. The edge spectrum for the family of graphs with property P is the set of all sizes of graphs with property P.

In this talk, I will present the results about the edge spectrum of K_4-saturated graphs. I will show that there is a K_4-saturated graph G if and only if either G is complete tripartite graph or $3n - 8 \leq |E(G)| \leq \lfloor \frac{n^2-n+4}{3} \rfloor$. I will also classify all K_4-saturated graph with $\kappa(G) = 2$ and $\kappa(G) = 3$. I will present the result on the edge spectrum of K_t-saturated graphs for $t \geq 5$. I will show that, for $n \geq 5t - 7$, there is an (n, m) K_t-saturated graph G if and only if G is complete $(t-1)$-partite graph or $(t-1)(n - \frac{t}{2}) - 2 \leq m \leq \lfloor \frac{(t-2)n^2-2n+(t-2)}{2(t-1)} \rfloor + 1$.

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