

GRAPH THEORY

Tutorial – 6

- 1. Let G be a simple n -vertex graph. Prove that, G is k -connected for all k with $k \leq 2\delta(G)+2-n$.**

- 2. Let G be a simple n -vertex graph.**
 - (a) Prove that, if $\delta(G) \geq \lfloor n/2 \rfloor$, then $\kappa'(G) = \delta(G)$.**
 - (b) If $d(x)+d(y) \geq n-1$ whenever $x \not\leftrightarrow y$, then prove that $\kappa'(G) = \delta(G)$.**

- 3. Let G be a simple graph with diameter 2 and let $[S, \bar{S}]$ be a minimum edge cut with $|S| \leq |\bar{S}|$.**
- (a) Prove that, every vertex of S has a neighbor in \bar{S} .**
 - (b) Use part-(a) and prove that, $\kappa'(G) = \delta(G)$.**
- 4. Prove that the symmetric difference of two different edge cuts is an edge cut.**