Graph Theory; Fourth Set of assignment problems

Thursday, 5 March, 2020

Sane

Assume that we are dealing with simple graphs.

1. The graph $G \bigvee H$ is obtained from $G + H$ (disjoint copies) by (additionally) drawing all the edges between G and H. Show that G is k-connected iff $G \bigvee K_r$ is $(k + r)$-connected. (2 marks)

2. Let G be a connected graph with $n \geq 3$. Let G^* be obtained from G (on the same vertex set and with all the edges of G retained) by drawing an extra edge (xy) for all the occurrences of $d(x, y) = 2$. Show that G^* is 2-connected. (2 marks)

3. Find smallest 3-regular connected graph with a cut vertex. (4 marks)