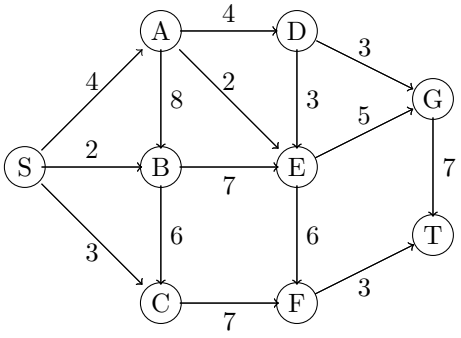
**CS 344: HWK 5**

**Problem 1.**

(a) For the given directed graph compute the MST using Kruskal's algorithm. Show the order of the selected edges as well as the sets being formed. If there is a tie use lexicographic ordering (i.e. edge (A,D) precedes edge (D,E)).

(b) Do the same to find MST using Prim's algorithm, Start at S.

(c) Using Dijkstra's algorithm find the shortest path from S to all other vertices. Show the complete history of each vertex $v$, starting with infinity as the value of $d(v)$, $v \neq S$, finishing with $\delta(S, v)$, the length of shortest path.




**Problem 2.** Using shortest path algorithm determine if the following system of inequalities has a feasible solution.

$x_4 - x_2 \leq -2$
$x_1 - x_3 \leq 3$
$x_5 - x_4 \leq -4$
$x_3 - x_2 \leq 2$
$x_2 - x_1 \leq 8$
$x_4 - x_3 \leq 1$
$x_1 - x_5 \leq -3.$