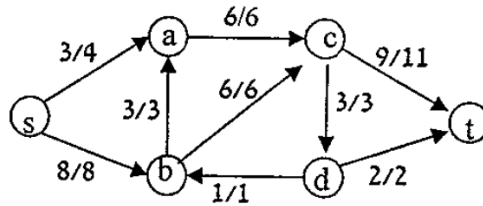


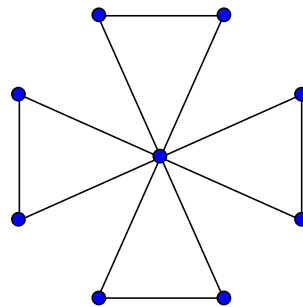
Name:

1. [7 pts] Consider the network in the figure (s is the source, t is the sink; and the label of an edge e is $f(e)/c(e)$ where f is a flow, c is the capacity function).

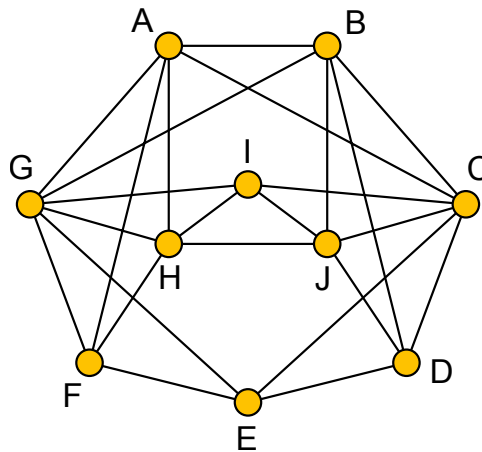


- a) Check that the flow f in the figure is feasible.
- b) Determine the value of the flow f .
- c) Find an augmenting path (with respect to f), and augment the flow using the path.

2. [6 pts] a) Is the graph in the figure 2-edge-connected?
 b) Is this graph 2-connected?



3. [6 pts] a) Execute a breadth-first search on the following graph starting from vertex A .
 b) Execute a depth-first search on the following graph starting from vertex A .



4. [6 pts] Prove that every d -regular bipartite graph contains a perfect matching, if $d \geq 1$.
 Hint: Use the König–Hall marriage theorem.