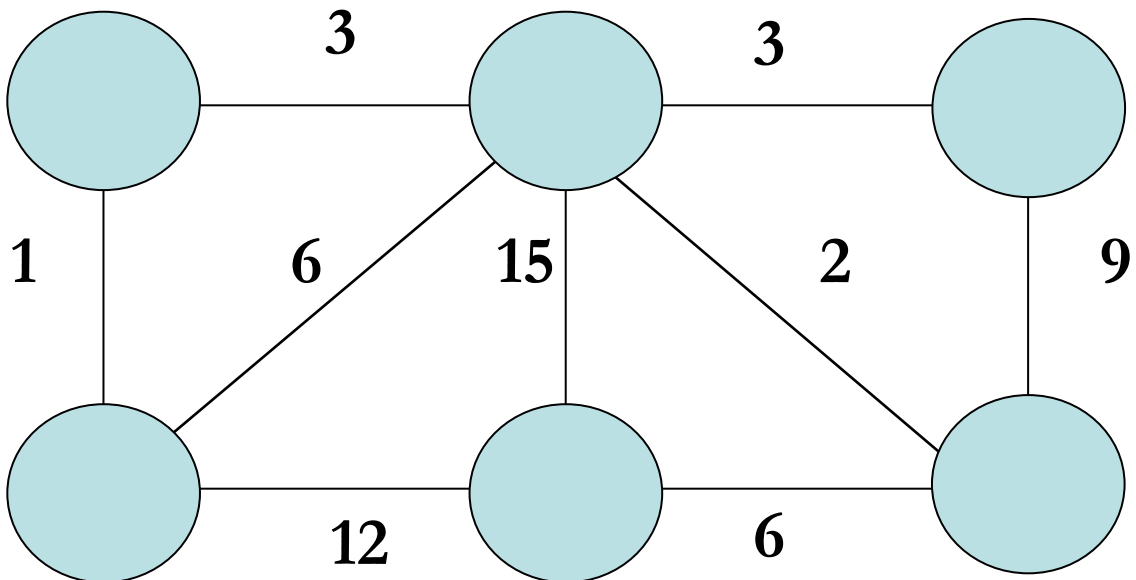


CS5224
2005/2006 Semester 1
HW 3

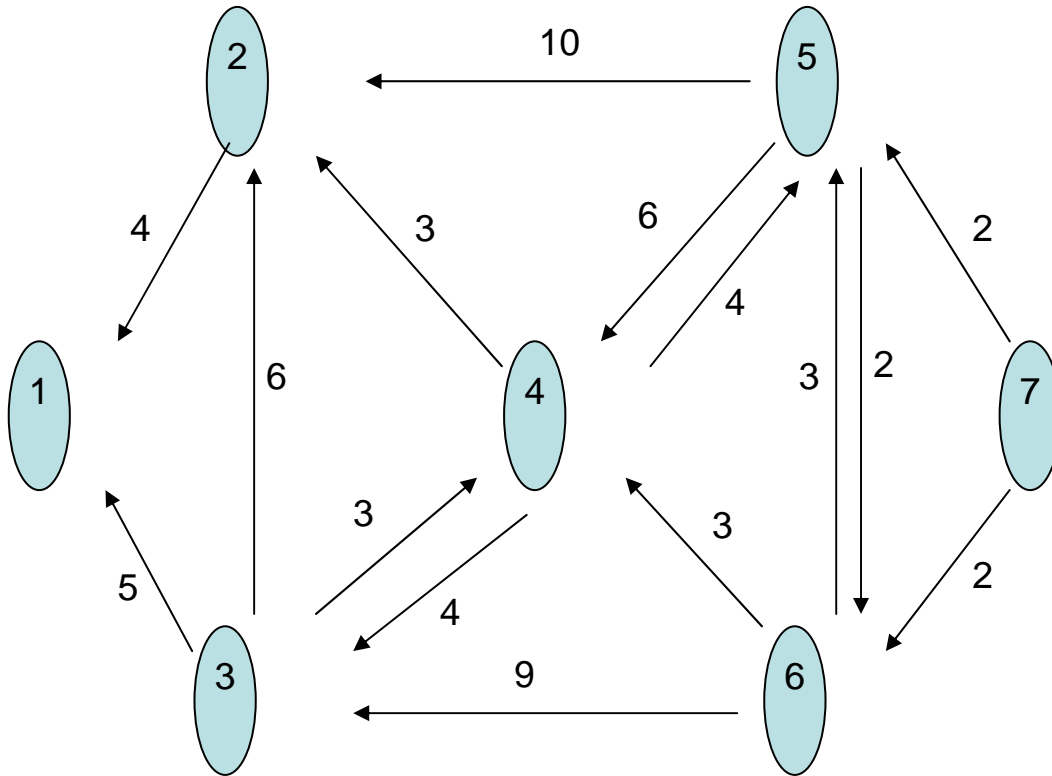
Due: Oct 30, 2005

1. (20pts) Download the packet trace on the course website, with filename “hw3.packet.in.1a” and “hw3.packet.in.1b”. The syntax for each entry is {arrival-time, packet-size, flow-id}. The service rate is 40 units per second. Using your program from the HW2, Question 4(b),
 - a. Compute the average and maximum service times of flows 1, 2 and 3 for “hw3.packet.in.1a”. Explain your result.
 - b. Compute the average and maximum service times of flows 1,2 and 3 for “hw3.packet.in.1b”. Explain your result.

2. (20 points) Find the minimum weight spanning tree of the graph shown below using either the Prim-Dijkstra or the Kruskal algorithms. Show the intermediate steps.



3. (20 points) Find the shortest path tree from every node to node 1 for the graph shown below using (a) the Bellford-Ford and (b) the Dijkstra algorithms.



4. (40 points) Download the graph description on the course website (hw4-q4-topo). The graph has 100 nodes (node 0 to node 99) and the links are uni-directional. The first line of the file specifies the number of nodes (100) and number of links (500) respectively. After that, each line in the file has three fields: source-node, destination node, and arc weight.
- (10pt) Find the shortest path for the following pairs of source-destination pairs.
node 0 to node 1
 - (10pt) Assume that all the arc weights are 1. Find the shortest (or minimum hop) paths from node 0 to node 1.
 - (20pt) Find the shortest path among all minimum hop paths from node 0 to node 1.