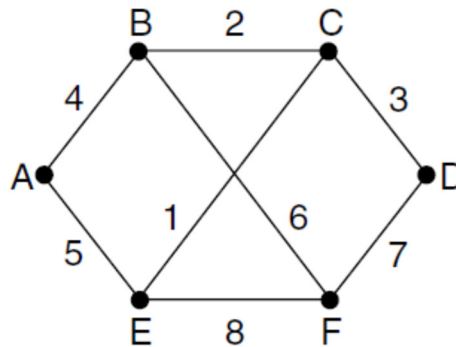




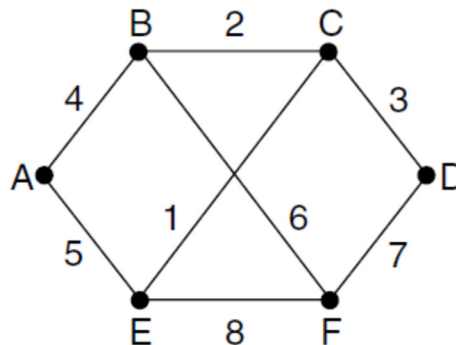
Computer Networks  
Written Assignment 3  
Due: 22 Ordibehesht 1398



1. Consider the following network.
  - a. Use distance vector routing to find the routing table at node A. Show all the steps until the convergence.
  - b. Use the distance vector routing to find the path towards node A for all the nodes. Show all the steps until the convergence.



2. Use the Dijkstra algorithm and find the routing table at node A. Include all the steps.



3. Using the results of Problem 2, find the broadcast path of packets of A if we use reverse path forwarding for broadcast.

4. Consider a host running token bucket flow control at the network layer.
  - a. The network layer receives the traffic from the upper layer as shown in Fig. 4 (two bursts at rates 100 MB/s each lasts for 10 msec). The tokens are added to the bucket at rate 10MB/s. Plot the token size (the number of accumulated token bytes). The token size at time zero is zero and the maximum token size is 1MB. Assume that the network layer is able to transmit traffic up to rate 100 MB/s.
  - b. Plot the output rate of the token bucket versus time.
  - c. Now assume that 10msec traffic bursts are coming periodically (every 90 msec) and the tokens are added to the bucket at rate 15 MB/s. If the maximum token size is 1.5 MB, plot the token size at the steady state.
  - d. If we add a leaky bucket with rate 50 MB/s underneath the token bucket in part c, plot the output rate of the leaky bucket.

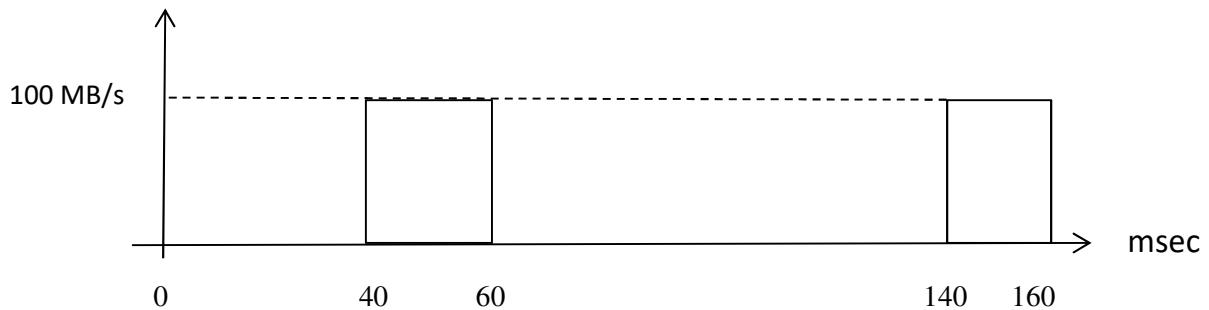


Fig. 4 Ingress (incoming) traffic rate to the token bucket

5. The forwarding table of a router is as follows:

Subnet address	Forwarding port
172.10.0.0/20	Port 1
172.10.16.0/19	Port 2
172.10.32.0/22	Port 3

Find the corresponding IP addresses related to each port.