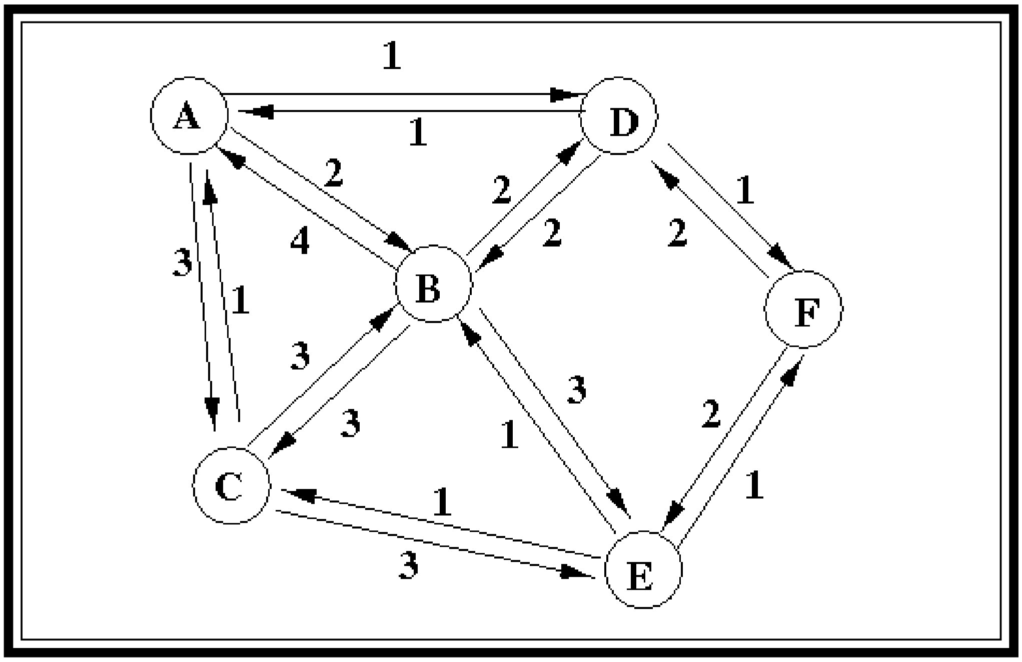
CS 558 - Computer Networking
Homework 9

Due: See class webpage.

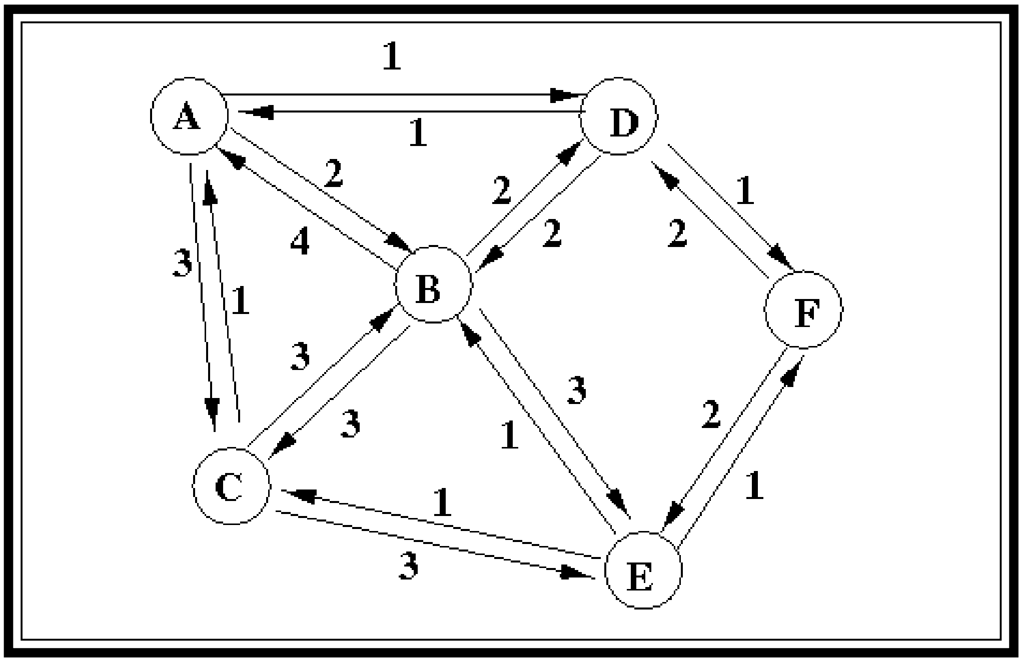
- **Question 1 (30 pts)**

  - High light the links of the **forward (path) tree** that is rooted at node **A** in the following network: (20 pts)



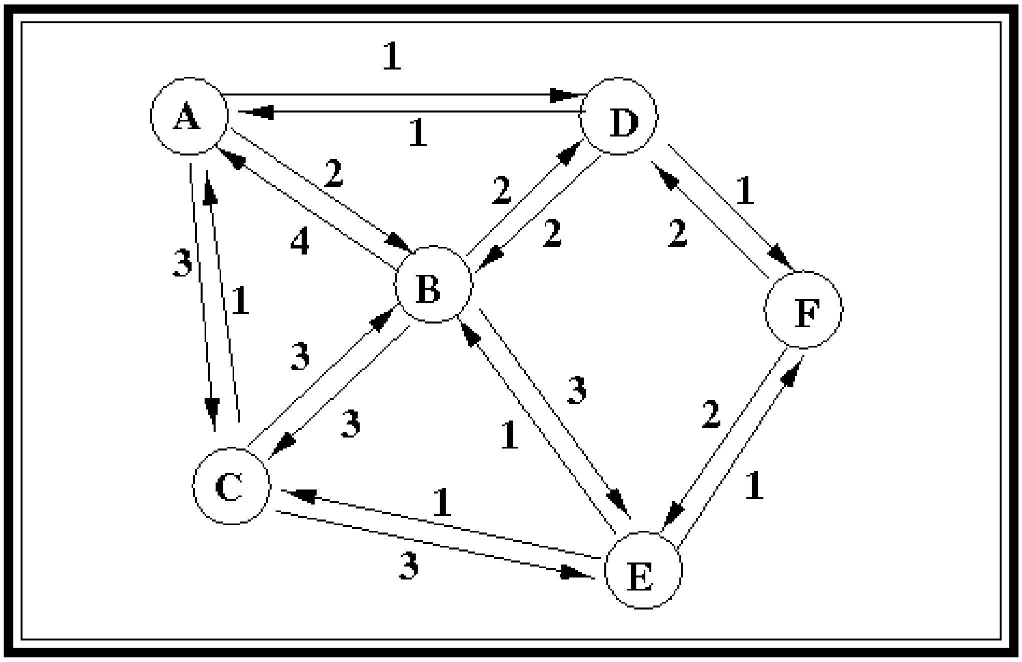
  - Give the content of the **routing table** for node **A**:

- **Question 2 (20 pts)**
  - High light the links of the **reverse (path) tree** rooted at node **A** in the following network:



  - Suppose the multicast uses DVMRP to send multicast messages and currently only nodes **D** and **E** are serving multicast members of some multicast group.

    High light the links the **multicast tree** that is rooted at node **A** that DVMRP will use in transmitting multicast messages:



- **Question 3 (25 pts)**
  - What are the advantages of pyramid broadcast ? (5 pts)
  - What are the disadvantages of pyramid broadcast ? (5 pts)
  - Can pyramid broadcast be used in live video transmission ? If yes, explain why, if no, explain why not. (5 pts)
  - Suppose the video data consumption rate is 1 Mbps. We use pyramid broadcast to transmit 100 video objects and each video object is 100 min in length. The total bandwidth of the transmissin medium is 1 Gbps.
    1. If we divide the video objects into 4 fragments, what is the maximum size ratio $\boldsymbol{f}$ between the successive fragments so that the receiver will not be disrupted (5 pts) ?
    2. And if we divide the video objects into 10 fragments, what is the maximum size ratio between the successive fragments so that the receiver will not be disrupted (5 pts) ?
- **Question 4 (25 pts)**

  Suppose the video data consumption rate is 1 Mbps. We want to broadcast 100 video objects and each video object is 100 min in length. The total bandwidth of the transmissin medium is 1 Gbps.

    - What is the access time if we use the staggered broadcast method ? (5 pts)
    - Suppose we use the pyramid broadcast method and divide the video objects into 4 fragments. What is the access time ? (10 pts)
    - We use the pyramid broadcast method and divide the video objects into 10 fragments. What is the access time ? (10 pts)