# Homework 1

1. Suppose an 802.11b station is configured to always reserve the channel with RTS/CTS sequence. Suppose this station suddenly wants to transmit 1,200 bytes of data, the transmission rate is 11Mbps and all other stations are idle at this time. As a function of SIFS and DIFS, and ignoring propagation delay and assuming no bit errors, calculate the time required to transmit the frame and receive the acknowledgement

2.. Consider the network shown below. Give global distance-vector tables of each node when the nodes receive update information from their neighbors. Assume that

a) each node initially knows its cost to its neighbors
b) each node has reported the information it had in the preceding step to its immediate neighbors
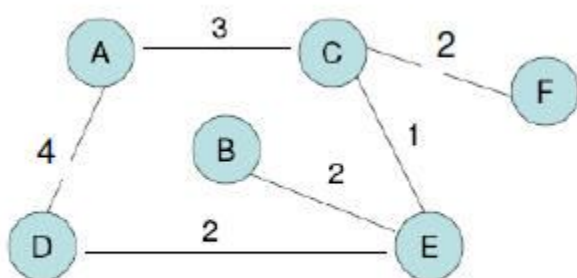

3. (link state routing) For the network given below, show how the link-state algorithm builds the routing table for node x. (note: you need to give the detailed steps)
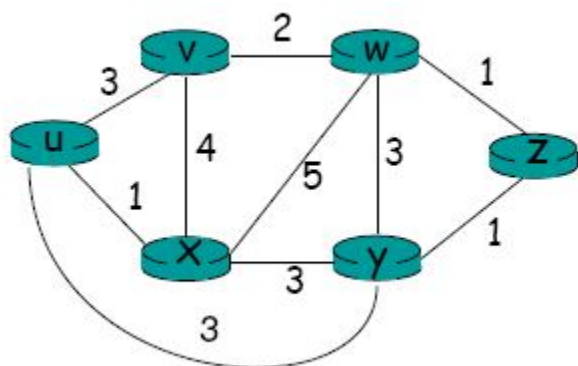
4.   Consider the network topology given in the following diagram.

a) Suppose the dark blue lines indicate the shortest path from A to all other nodes. If A broadcasts a packet, please describe in detail how the nodes route the packet using RPF? Note: you need provide the information about which packets from which link should be forwarded or not.
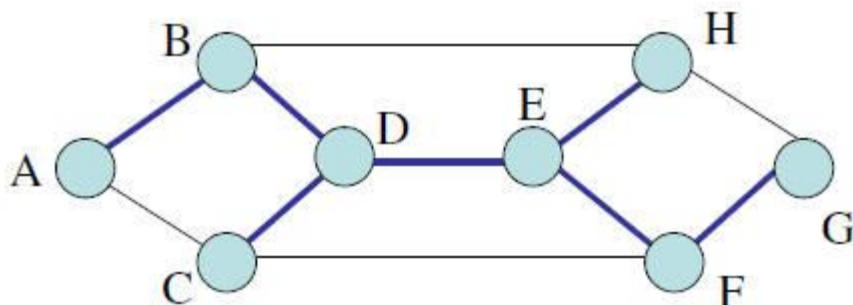

b) Suppose E is selected as the center node, please describe in detail how to construct a spanning tree using center based approach.

Note: you need to make assumptions as needed.

c) Based on the spanning tree constructed in b), if E broadcasts a packet, how do the nodes route the packet?

5. Consider the network in the above diagram. Suppose routers C and G don't have group numbers and A is the sender. Describe in detail how RPF with pruning works?
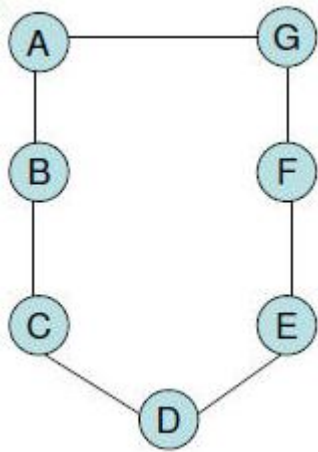
6. Consider the topology given in the following diagram. Simulate DSR protocol for path establishment from node 2 to node 11.
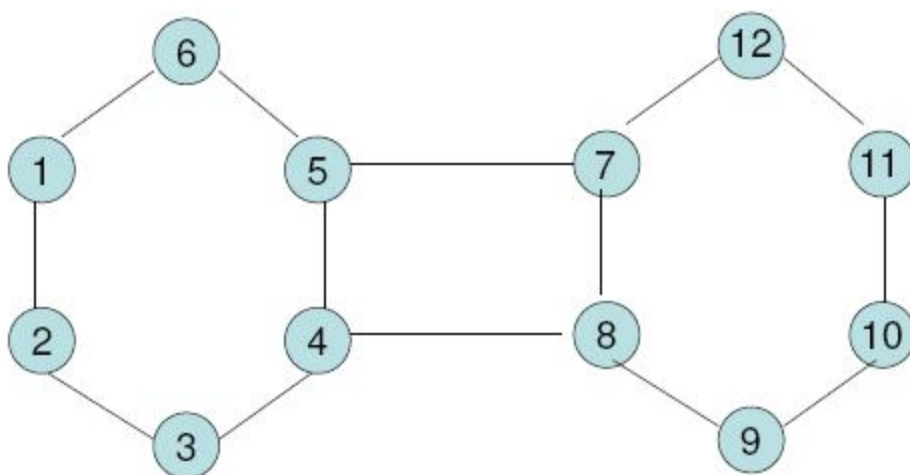
7. AODV protocol is used in the following MANET. Node G needs to send a packet to node C. Since G doesn't have a route to C, so G sends a RREQ
<source address, source seq#, broadcast id, destination address, destination seq#, hop count>
= <G, 120, 30, C, 20, 0>

a) Suppose   tables in nodes A, G, and B are empty, describe how each node sets up the reverse path along the path G-A-B-C. Give content of the table in each

b) Now, C receive the RREQ and replies with a RREP with a new desi_sequence number 40, describe how each node sets up a forward path. Give the content of the table in each node along the path.

c) Suppose the table in F is empty and the table in E has one entry <C, D, 2, 50, --,-->, how the RREQ is processed along the path G-F-E-D-C. Note: you don't need to give the table information at each node.

d) Suppose the table in F is empty and the table in E has one entry <C, D, 2, 10, --,-->, how the RREQ is processed along the path G-F-E-D-C . Note: you don't need to give the table information at each node.