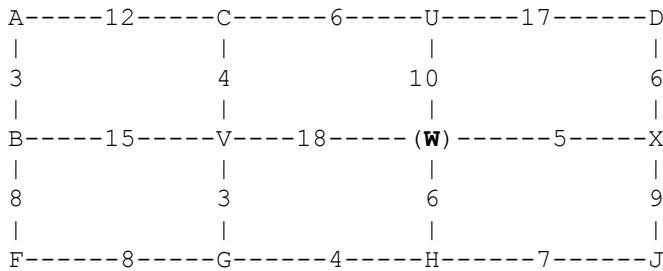


Question 4. Dijkstra Routing, Link State, OSPF

Every router (A, B, ..., J) has advertised the costs (delays) to all the other nodes. Based on all the advertisement messages, the network topology and link costs can be mapped. The letters below represent the nodes (routers) on the network. The numbers represent costs (delay-times) on the links between them.

These nodes are all routers and, for simplicity, routes have the same cost in both directions.



Routing Table for W

A	-	<u> U </u>
B	-	<u> H </u>
D	-	<u> X </u>
J	-	<u> H </u>

Using Dijkstra's technique, calculate the cost values of routes from node "W". List Permanent Nodes in the order that they were added to the tree: (*Show work, zero points unless it and (a) indicate the you can apply Dijkstra's algorithm.)

a. X , H , U/G , G/U , D , J , V , C , F , B , A (20 points if totally correct)

Question 5. Routing Algorithms. Fill in the following table. (2 points each = 20)

Area Covered	Protocol	Routing Algorithm	Exchanges Info With: (Neighbors, All)	Can Be Hierarchical (yes/no)
World	BGP	Various	NA	Yes
AS or Organization	OSPF	Dijkstra	All	Yes
Small Network (Lab)	RIP	Bellman-Ford	Neighbors	No

b. Routers construct routing tables based on information received from _____: b. _____

c. An RIP router A receives the following distance-vector updates from neighbors

- B and C: B says: X is 4 hops away, Y is 8 hops away,
- C says: X is 6 hops away, Y is 7 hops away.

Using Poison Reverse, to prevent (d. ___), A sends an update to B saying that d. _____

[A to B] X is (e. ___) hops away, Y is (f. ___) hops away. e. _____ f. _____

d. The component of a router that usually causes most of any appreciable delay is : f. _____

Question 6. Network and Lower Protocols (2 points each = 26)

What in IPv6 relative to IPv4 was added? a. Flow Identifier

What in IPv6 relative to IPv4 was removed? b. Fragment Information

What in IPv6 relative to IPv4 was changed? c. Length of Addresses (32 -> 128 bits)

Which Data Layer protocol(s) uses Carrier Sense? d. Ethernet, WiFi and WiMAX

Y

Name (print) _____

Which Data Layer protocol(s) uses Collision Avoidance?

e. _____ **WiFi and WiMAX** _____

Which Data Layer protocol(s) uses Collision Detection?

f. _____ **Ethernet (IEEE 802.3)** _____

Which Data Layer protocol(s) uses ARQ (ACK and resend) ?

g. _____ **WiFi and WiMAX, ALOHA** _____

What two characteristics define a Spanning Tree ?

j. **_Covers all nodes_** k. **_No loops_**

What two things make Ethernet more efficient than ALOHA ?

h. **_Collision Detection** i. **_Carrier Sense_**

When separate LANs share the same Ethernet switches using 802.2q, they are called _____ ? l. **_VLAN (virtual)_**

Which Protocol Layer is concerned with Bit-Clock synchronization?

m. _____ **Physical** _____