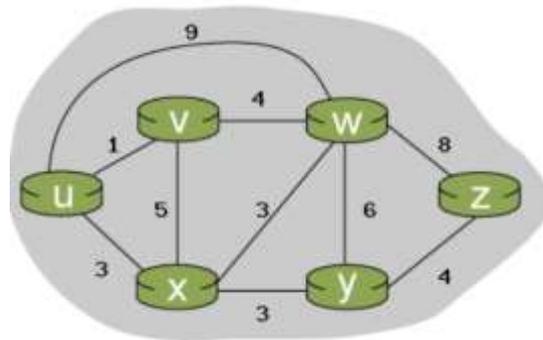


Computer Network

- (1) Explain the meaning of the following terms relating to the CSMA/CD MAC:
 - A. Multiple access
 - B. Carrier sense
 - C. Collision detection
 - D. Backoff
- (2) Explain Shannon's Theorem on channel capacity. Your discussion should include the following parameters: channel capacity C , bandwidth B , average signal power S , and average noise power N .
- (3) Discuss the Clos Criterion that guarantees a non-blocking switch.
- (4) Using Dijkstra's algorithm, find the least cost path from source node **u** to all other destinations. For each destination, list the nodes encountered in the traversal



- (5) When an IP datagram is dropped by a router, and the router generates an ICMP error, why does the ICMP error contain in the payload the first few bytes of the dropped IP datagram?
- (6) Compute the 16-bit Internet checksum used in most Internet protocols for the data '0010 1100 0111 1001 0001 0000 1000 0010 1001 1100 1111 0000'
- (7) TCP uses three-way handshaking to establish its connection. Explain three-way handshaking with related fields in TCP header.
- (8) Answer the following questions on RTS/CTS in wireless LAN.
 - A. Why do we need it? (i.e. In what situation does it help?)
 - B. What are the costs associated with it?
 - C. When do we turn it off? (considering the costs discussed in (B))
 - D. What is the side-effect? (i.e. Explain the Exposed Node Problem)
- (9) Answer the following questions on IP multicast.

- A. Explain the difference between Any Source Multicast (ASM) model and Source Specific Multicast (SSM) model?
- B. Which is a better model for IPTV? Explain why.