

## Networking Comprehensive Exam

Work each of the following problems. In numbers 1 and 2 provide complete explanations; no credit will be given for information that does not relate to the question. In question number 3 mark the answers as requested, and no further explanation is needed for this question only. In question number 4, show how you obtain your answer and make sure the work can be followed and includes comments.

1. Routers support both “forwarding” and “routing.” Explain the difference between these services.
2. An ATM network is said to be “connection oriented” and an IP network is “connectionless.” Explain the difference by giving specific examples of functions (relevant to this question) that are present in one network and not in the other. Do NOT provide general differences between ATM and IP that have nothing to do with the connection-oriented and connectionless concepts.
3. Indicate whether each of the following is more typical of link-state routing or distance-vector routing by writing LS (for link state) or DV (for distance vector) in front of each letter a through e below. (5 answers)
  - a. Each network node exchanges routing updates with all the other nodes in the network.
  - b. Each node in the network builds a representation of the entire network topology.
  - c. “Counting to infinity” may be a problem.
  - d. Routers use Dykstra’s algorithm to determine optimal routes within a single autonomous network domain.
  - e. RIP.
4. Station A needs to send the message bits 10111001 to station B protected by a CRC that uses a generator polynomial given by 111. What is the codeword that Station A constructs and sends to Station B?