

CS 290F: Networking for Multimedia
Diagnostic—January 04, 2010

- (1): In what year was the topology of the ARPAnet first conceptualized?
- (2): List the layers of the OSI stack that are *widely understood to be used in the Internet*, and give a one sentence description of the function of each of these layers.
- (3): What are the four functions of the data link layer?
- (4): A switch never broadcasts any frames. Is this statement true or false? Justify your answer.
- (5): Describe the process an Ethernet NIC goes through when attempting to transmit a frame. Also include a description of what happens if the NIC detects a collision.
- (6): Combine the following ranges of addresses into the fewest number of entries: 54.37/16 and 54.38/16.
- (7): If 16.20.128/17 were split into 64 equal-sized blocks of addresses, how many addresses would be in each block?
- (8): Which routing protocol and algorithm work by having routers send information only to their neighbors? Be sure to *clearly* identify which is the protocol and which is the algorithm.
- (9): What are the “value-added” services offered by TCP?
- (10): What are the “value-added” services offered by UDP?
- (11): How is the first sequence number in a TCP connection chosen? Why is it done this way?
- (12): Give the two reasons why TCP slow start is not fast enough in a satellite-to-ground network.
- (13): Which error detection scheme will provide better protection against errors: the checksum used by Ethernet or the checksum used by TCP?
- (14): Is it possible to implement congestion control at the application layer for packets sent using UDP? If so, could it be done without changing the UDP header? If not, could a new transport protocol be designed that offered only multiplexing/de-multiplexing and congestion control?
- (15): What are the two ways in which DNS searches can be executed?
- (16): cnn.com decides to change its name one day to xnn.com, and consequently changes the authoritative entries in its local DNS server. However, the DNS cache on *your* machine still has the old entry. If you try to access cnn.com through your web page, will you be connected or not? Justify your answer.
- (17): Assume that a machine on the network does not have any entries in its ARP table or its DNS cache. If I now surf the web at amazon.com, which protocol, DNS or ARP, will be the first to send a packet over the network? Explain your answer.