

MITP 432

Communication Networks I

Homework #2

- 1) [10] Express each of the following IP addresses in binary format and determine the address class (assume classful addressing):
 - a) 145.32.59.24
 - b) 200.42.129.16
 - c) 14.82.19.54
 - d) 237.119.20.251
 - e) 245.0.1.17
- 2) [10] Express the following IP address ranges in CIDR (address/prefix) notation:
 - a) 10.0.1.0 – 10.0.1.255
 - b) 223.17.143.64 – 223.17.143.127
 - c) 129.1.0.0 – 129.1.1.255
 - d) 153.128.0.0 – 153.255.255.255
 - e) 149.112.92.252 – 149.112.92.255
- 3) [10] Express the following CIDR expressions as address ranges:
 - a) 192.228.12.0/24
 - b) 12.0.0.0/8
 - c) 69.171.55.192/26
 - d) 143.15.128.0/22
- 4) [15] Express the following address spaces in CIDR notation (hint: look at the first bits to find a common prefix):
 - a) Class A
 - b) Class B
 - c) Class C

- 5) The notes list several basic goals of data link protocols.
 - a) [5] Which of these basic goals does PPP achieve?
 - b) [5] Which of these goals does Ethernet achieve?
- 6) [10] The MTU of Ethernet is 1500 bytes. A UDP packet with a total length of 9001 bytes (as reported in the IP header) must be fragmented to be transmitted over this link. Determine the IP header fields total length, fragmentation offset and the state of the “more fragments” bit for each of the fragments created.
- 7) [5] The IP TTL field is used to determine the number of hops remaining before a packet is discarded. For what types of traffic would it be useful for the sending host to set the TTL to 1?
- 8) [10] With your computer on a network, dump your IP routing table (“route print” from DOS or command window) and explain each entry.
- 9) [10] You are given the class B address space of 189.13.0.0/16 to partition into four subnets. Three of these subnets must be able to address up to 5000 hosts, while the fourth must be able to address up to 18000. Determine the network, mask, and broadcast address for each subnet. You may assume that the broadcast address is the subnet’s highest address.
- 10) [10] Host A with IP address A_{IP} and MAC address A_{MAC} sends an ARP request to host B with IP address B_{IP} and MAC address B_{MAC} . Host A and host B are on the same Ethernet LAN. Write out the values of *all* of the fields in the ARP reply packet, including the Ethernet header.