

# ITS323 – Quiz 7

Introduction to Data Communications, Semester 1, 2010

Prepared by Steven Gordon on 16 September 2010

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## Question 1 [6 marks]

The following questions are about host A with the *classful* IP address: [ 130.117.64.12 | 200.160.2.20 | 104.96.4.20 | 116.20.17.4 | 160.3.29.12 | 194.200.64.32]

(a) What is the class of the IP address? [2 marks]

**Answer.** *The class can be determined by looking at the first bits in the address. That is convert the first decimal number to binary: if the first bit is 0, then class A; if the first two bits are 10 then class B; if the first three bits are 110 then class C. Hence:*

- *130.117.64.12: Class B*
- *200.160.2.20: Class C*
- *104.96.4.20: Class A*
- *116.20.17.4: Class A*
- *160.3.29.12: Class B*
- *194.200.64.32: Class C*

(b) Host B has the IP address [ 130.117.0.1 | 200.160.3.21 | 104.0.4.21 | 116.0.0.1 | 160.4.0.12 | 194.200.32.4]. Is host B on the same subnet as host A? Explain your answer. [2 marks]

**Answer.** *If two hosts are on the same subnet then their IP addresses must have the same network portion. For class A the network portion of the address is the first 8 bits (or the first decimal value); for class B the first 16 bits (first 2 decimal values); and for class C the first 24 bits (first 3 decimal values). Or in other words, both hosts have same network address.*

- *130.117.64.12: Network address 130.117.0.0; 130.117.0.1: network address 130.117.0.0. Yes, the two hosts are on the same subnet.*
- *200.160.2.20: network address 200.160.2.0; 200.160.3.21: network address 200.160.3.0. No, they are on different subnets.*
- *104.96.4.20: network address 104.0.0.0; 104.0.4.21: network address 104.0.0.0. Yes.*
- *116.20.17.4: network address 116.0.0.0; 116.0.0.1: network address 116.0.0.0. Yes*

- *160.3.29.12: network address 160.3.0.0; 160.4.0.12: network address 160.4.0.0. No.*
  - *194.200.64.32: network address 194.200.64.0; 194.200.32.4: network address 194.200.32.0. No*
- (c) What is the single IP address that host C would send to in order to deliver data to all hosts on the same subnet as host A? Assume A and C are on different subnets [2 marks]

**Answer.** *Host C would send to the directed broadcast address for the subnet of host A. Directed broadcast address can be obtained by setting the host portion of the address to all binary 1's.*

- *130.117.64.12: directed broadcast is 130.117.255.255*
- *200.160.2.20: directed broadcast is 200.160.2.255*
- *104.96.4.20: directed broadcast is 104.255.255.255*
- *116.20.17.4: directed broadcast is 116.255.255.255*
- *160.3.29.12: directed broadcast is 160.3.255.255*
- *194.200.64.32: directed broadcast is 194.200.64.255*

## Question 2 [4 marks]

Answer the following questions about internetworking, nodes in an internet and the Internet Protocol by filling in the blank spaces or circling True or False where appropriate.

- (a) A \_\_\_\_\_ forwards IP datagrams but a host does not. [2 marks]

**Answer.** *router*

- (b) IP is a connection-oriented protocol. True or False. [2 marks]

**Answer.** *False (IP is a connection-less protocol)*

- (c) All hosts and routers in the Internet must implement IP in the \_\_\_\_\_ layer. [2 marks]

**Answer.** *networking*

- (d) IP uses packet switching and provides guaranteed delivery of data between source and destination. True or False. [2 marks]

**Answer.** *False (although it uses packet switching, IP does not guarantee delivery of data)*

- (e) Three basic internetworking functions that IP includes are: multiplexing, addressing and ----- [2 marks]

**Answer.** *Fragmentation and re-assembly*

- (f) The host portion of the IP address of a host in subnet A can be the same as that for another host in subnet B. True or False. [2 marks]

**Answer.** *True (hosts in different subnets may have the same host portion in the IP address, but the network portions must be different)*

- (g) A ----- will normally have two or more interfaces, whereas a host normally uses one interface at a time. [2 marks]

**Answer.** *router*

- (h) IP does not provide fragmentation/re-assembly, security or flow control. True or False. [2 marks]

**Answer.** *False (IP does provide fragmentation/re-assembly)*

- (i) In IP addressing, a ----- address is a special address used to identify subnets in an internet. [2 marks]

**Answer.** *network*

- (j) Even if an Internet host has an IEEE 802 MAC address, it still needs an IP address. True or False. [2 marks]

**Answer.** *True (every host in the Internet needs an IP address)*

- (k) There are three types of switching: of these, IP uses ----- switching. [2 marks]

**Answer.** *Datagram packet switching*

- (l) If an internetworking protocol uses fragmentation only at the source and re-assembly only at the destination, then an advantage is that maximum sized packets will be sent over all subnets in path. True or False. [2 marks]

**Answer.** *False (packets will not necessarily be at maximum size)*