Quiz #1 (15 minutes, 16 points)   Name: _____Solution in blue_____

10.1.x.x
255.255.0.0

10.1.x.x
255.255.0.0

128.59.19.1
255.255.0.0

PC3

Router1   Hub2   Router2

PC1

PC2

Hub1

10.1.x.x
255.255.0.0

10.0.x.x
255.255.0.0

10.0.x.x
255.255.0.0

128.59.19.10
255.255.0.0
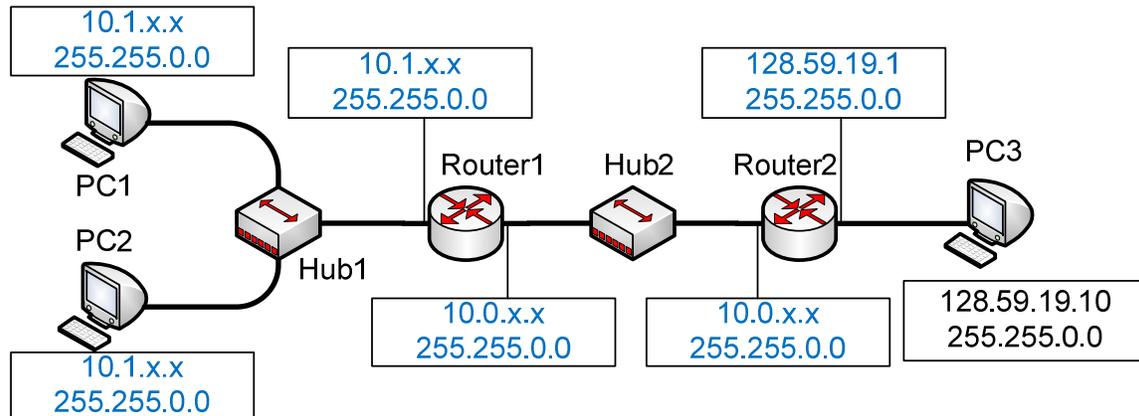
1. How many subnets are there in the diagram? (1 point) _____3_____

2. PC3 has been assigned an IP address and a netmask. Fill in the rest of the IP addresses from the list below so that there is end-to-end connectivity between all machines in the network. (6 points)

        10.0.1.23 / 255.255.0.0   10.1.138.2 / 255.255.0.0

        10.1.1.23 / 255.255.0.0   128.59.19.1 / 255.255.0.0

        10.1.2.3 / 255.255.0.0   10.0.138.2 / 255.255.0.0

   To have end-to-end connectivity, every machine in each subnet must have the same network address and netmask. The IP address of each individual machine in the subnet does not matter as long as the network address is correct.

   For the right side of router 2, the address should be 128.59.19.1.
   For the subnet on the far left, any address that starts with 10.1. is correct.
   For the link between two routers, any address that starts with 10.0. is correct.

3. Fill in the blanks below. (9 points)

   When PC1 wants to send a packet to PC3, it will first look at the routing table to find out where to forward the packet. Since PC3 is not directly connected to PC1, PC1 will forward the packet to the _____default_____ gateway, which is Router1 in the diagram above.

   PC1 knows the IP address of Router1 but doesn't know the _____MAC_____ address, so it sends a(n) __ARP Request_____ packet. Router1 replies with a(n) ___ARP Reply_____ packet.

   With this information, PC1 now sends the packet to Router1. Router1 looks at its ___forwarding_____ table to figure out where to send this packet. Router1 uses the __destination IP address_____ as an index to this table to find out which outgoing link the

packet should be sent to. It figures out that it should be sent to Router2. So it sends the packet to Router2.

Since Router2 is directly connected to PC3, Router2 must find out the _____MAC_____ address of PC3. Router2 sends a(n) _ARP Request_____ packet. It is broadcasted / unicasted within the subnet. PC3 replies. Router2 forwards the packet to PC3, thereby finishing our little story of the traveling packet.