1. Course Handout: Network layer 13b;

2. P9 in K&R Chapter 4 (Network Layer) - this is on page 445 in my book. “Consider the switch shown below…”

3. IPv6 Addresses
   (a) Write the following IPv6 address in shortened form:
       \[2041:0000:140F:0000:0000:0000:875B:131B\]
   (b) Suppose the network interface has hardware id \[00:e0:4c:53:44:58\]. What should the link-local IPv6 address for that interface be? Explain why on Windows and Mac OS X the address the computer picks might not match the address specified in the RFC.
   (c) BT, my ISP, provides each customer a /56 IPv6 network block. If my IP is \[2a00:23c4:bfb9:6801:a58f:b33f:26ad:d13c\], what is the routing prefix? How many subnets can I have on my network?

4. Questions about DHCP and SLAAC
   (a) When a host first joins an IPv4 network, to obtain an IP address via DHCPv4, what IP address does it need to send a packet to?
   (b) What key pieces of information is provided to a newly connected host in a DHCPv4 offer?
   (c) When joining an IPv6 network, how does a host know whether to use SLAAC or DHCPv6?
   (d) DHCPv6 messages differ from DHCPv4 messages in that they no longer contain information about DNS servers and gateway IPs. Where do hosts obtain this information from instead?

5. Consider the following network topology where some residential hosts connect to the Internet via NAT devices:
(a) Host A has an active SSH connection (Port 22) to Host E. Give a plausible value for the (source address, destination address, source port, destination port) 4-tuple for packets in this connection as they exit Host A’s computer. Indicate what elements of the tuple would be assigned at connection time (and select arbitrary values).

(b) What is a plausible value for the (source address, destination address, source port, destination port) 4-tuple for packets for the connection in (a) when they arrive at Host E? Again, indicate what elements would be assigned at connection time.

(c) Suppose Host D wishes to serve web pages (on port 80) to the Internet. What must happen in order for devices on the Internet to access the server on Host D?

(d) Host B attempts to connect Host D (i.e. by sending a packet to D). List out how the (source address, destination address, source port, destination port) 4-tuple evolves as it traverses the network from B to D. Indicate what elements would be assigned at connection time.

(e) Host A and Host C have the same IP address. Is this an issue? Explain why it is or isn’t.

6. Course Handout: Transport layer 15, 16, 17 (if/when lecturer gets to it)

7. Using a timing diagram to track the sequence of sent messages and acknowledgements, show that if messages can be reordered (i.e., a packet might be delayed and received after a packet that is subsequently sent), the rdt 3.0 state machine using alternating bits will not work as designed.
8. P19 in K&R Chapter 3 (Transport Layer) - this is on page 317 in my book. 
“Consider a scenario in which Host A wants to simultaneously send packets to Hosts B, and C...”