Chapter 5, Layers 4 & 5

Capabilities/responsibilities of layer four (Table 5-1)
Define TCP; Generally identify the contents of TCP header; What is the purpose of source port, destination port, sequence number, acknowledgment number, flags, window, and checksum?
How are port numbers used? How do separate data between applications?
What is an ephemeral port number? How is it used?
What are well-known, registered and dynamic port numbers?
Identify registered port numbers for FTP, Telnet, HTTP and POP3. What purpose do these applications serve?
Define socket.
What do the flags ACK, FIN, SYN communicate? How are these flags used in a three-way open and a four-way close?
Describe the UDP header? What does it contain? How and why is it different than an TCP header?
What is QoS? Define delay, jitter and loss (measurement of loss)
Define batch, interactive and real-time application?
Be able to identify a given scenario as a batch, interactive or real-time application
What is DNS? How and why does a client work with a DNS server?
Describe the series of HTTP Get requests needed to render a web page. For a given web page scenario, how many requests will be needed?

Chapter 6, Ethernet LANs and Switches

Define and differentiate between hubs, bridges, switches and routers; What function does each serve?
What topology does each enforce?
What is a collision domain? How is a collision domain implemented with a hub, bridge, switch and router?
What is a broadcast domain? How is a broadcast domain implemented with a hub, bridge, switch and router?
Understand Table 6-2.
What is a vlan? How does it affect collision and broadcast domains?
How does a switch function? (See steps on page 132)
What is contained in the switch’s address table? Do multiple switches use the same table? Why?
Is it possible for one port on a switch to be associated with more than one mac address? How does this happen?
Is it possible for one mac address to be associated with more than one port on a switch? Why?
Define and differentiate between unicast, multicast and broadcast frames?
What is flooding? When is it used?
Differentiate between store-and-forward and cut-through switches. What are the comparative advantages of each?
What is the spanning tree protocol? What is its purpose? How does it differ from RSTP? Remember all switches must support STP in order for it to work.
In network design, what are access and distribution layers? What are access, distribution and core switches?
What is link aggregation? What is the effect of its use? Remember both switches must support the applicable protocol for this to work.
What are the most common types of Ethernet?
Is a hub required to support the same speed on all ports? Why? (Consider the topology)
Is a switch required to support the same speed on all ports? Why? (Consider the topology)
How does autonegotiation work?
What is the default duplex setting if only one node supports autonegotiation?
Chapter 7, Cisco Switches

On a Cisco 2960 switch, what is the function of the mode button? What three modes are indicated? What does each describe?

What is the IOS?
What is the CLI?
How are switch ports referenced/numbered?
How can a console be physically attached to a 2960 switch?
What three connection methods can be used to access

Wireless and related:

Physical wireless nic options
Define wireless access point (WAP) and describe how they are used. What topology does it follow?
Compare a wireless access point to a “home” wireless router. What additional capabilities does a home router possess?
What is the purpose of NAT (network address translation)?
What is the purpose of DHCP?
Compare dish and omnidirectional antenna - advantages & disadvantages of each
Types of wireless propagation problems; Compare wireless attenuation with UTP and fiber; Compare propagation problems associated with higher and lower frequencies
What is the thrust of Shannon’s Equation?
Compare ad hoc and infrastructure modes. What topology does each follow?
What is an SSID? What is its purpose?
What is a channel? What channels are used in the US? What channels do not overlap?
Generally, how do each of spread spectrum transmissions work? Frequency hopping, direct sequence, orthogonal, MIMO; Which are used by 802.11b, g, a and n?
For 802.11b, g, a and n, what frequency band is used? What is the stated speed? What is the stated range? Is it compatible with other standards?
What happens when 802.11b and 802.11g nodes are mixed?
Difference between 802.3 & 802.11
Describe wire collision problems; How does CSMA/CA+ACK?
Define war driving and drive-by hackers. How can this threat be addressed?
Define rogue access point. How can this threat be addressed?
Describe evil twin access pont
What is MAC address filtering? Does is provide good security? Why?
Compare WEP, WPA and 802.11i (WPA2). Which is preferred? Why?
What are static and dynamic keys? Where are they used?
Define 802.1x. What is a RADIUS server? What is EAP?
What do managed waps provide?
What is a wireless bridge?
What are the capabilities of Bluetooth? For what is Bluetooth useful?
What is RFID? How does it work? Where is it used?

Operating Systems (based on Linux slides)

Define device driver, service
Define multiuser, multitasking, multiprocessing, thread
Define kernel
Define MULTICS, UNIX, DOS, MAC OS, Windows
Describe the General Public License
Contrast open source, closed source, shareware and freeware
What is TCO?
Hardware:

Define CPU, ALU control unit
Relate processor throughput to speed, number of processors and number of bits.
Cache: What is it? What is L1, L2 & L3 cache?
What is the front-side bus? How does it’s speed affect performance?
Identify the highest performing Intel processor from a list. Identify the highest performing AMD processor from a list. Identify processors more appropriate for PCs v servers.
Describe RAM and ROM. What is volatile? How does it apply?
Differentiate between static and dynamic RAM. Where is each used?
Define DIMM and SODIMM
Define disk geometry: track, sector, cylinder
Define IDE (EIDE), Serial ATA (SATA) and SCSI - How is each connected?
Define partition and file system
Define master boot record and boot record; Where are they? How are they used?
Define AGP, PCI and PCI express
Be able to identify a component from a given diagram (see slide 51)
Define IEEE 1394, COM, LPT & PS/2
Define USB. Differentiate between 2.0 and 3.0
What drives the need for video ram?
How can keyboards and mice be connected to the motherboard?
What is the HCL? How should you use it?