Spring CPS372 Midterm Exam Review

Expect about 10-20 questions ranging over chapters 1-3 - expect questions coming from most if not all of the chapters.

Two example questions:

1. In what way is a proxy server used (give a descriptive scenario)? Why is a proxy server used?
Answer: see section 2.2.6.

2. Here's a sample UDP segment made up of 3 sixteen bit words:

1001010111010101
1001011101011010
0010110100101111

Create the correct UDP checksum for this segment.

Answer:
1001010111010101 (add these)
1001011101011010

0010110100101111
with carryout of 1 (save the carryout - we'll need this soon)

0010110100101111 (add these)
0001011011010110
0100010000000101

now add that carryout of 1 to the lowest order bit
0100010000000101 (add that carryout)
1
0100010000000110 (we finally have the sum)
1011101111111001 (take 1's complement - this is the UDP error checksum)

What is the best way to prepare for this closed book exam?

1. Read the textbook.
This will help you find the important points to focus on. You may want to outline the chapters.
2. Look over the class powerpoint slides (found on website)
This will a good way to see the major points covered in class.
3. Look over the review questions at the back of the chapters.
4. A calculator may be necessary for this test.

Most important topics per chapter

Chapter 1

Networking overview
Packet switching vs. circuit switching
Store-and-forward networks
Internet structure (access networks, physical media, ISPs, and backbones)
Delay in data networks and packet loss
Layered network architecture
[History not included]

Chapter 2

Network App Architecture: Client-server and Peer-to-peer model
Application requirements for loss, bandwidth, and delay
Application-layer protocol concepts:
    persistent vs. non-persistent connections, stateless vs. stateful, out-of-band control
HTTP protocol (including cookies, web cache, proxy server, conditional GET)
FTP protocol
Email protocols (SMTP, POP3, IMAP)
DNS service
P2P File Sharing
[Socket Programming not included]

Chapter 3

Services offered by the transport layer (in particular offered by TCP and UDP)
Relationship with network layer
Multiplexing and de-multiplexing
UDP - overview, checksum
Principles of reliable communication
Selective Repeat (not GoBackN)
TCP concepts and principles: (climatic moment in chapter – this is a must to know)
    Basic segment structure (header)
    RTT estimation
    Reliable data transfer
    Flow control
    Congestion control: various phases (slow-start, congestion avoidance)
        Do know the TCP congestion control states (events and action) found on page 285.
    Connection establishment and tear-down (3-way handshake)
[No TCP delay modeling]

Do not memorize:
Rdt1.0 through Rdt3.0 (however I will expect you to understand the transmission protocol if such a FSM is given.)
Details of command sets for the various protocols for the application layer – i.e. list for POP3