CS 356 (Simon Lam)

Review notes for exam 1

Bring a calculator and one page of notes

Review homework solutions

Note: It is possible to have exam questions on materials covered in my lectures that are neither in the following list nor in my lecture slides.

Chapter 1 notes

Modulation/demodulation, FDM and TDM, Shannon Theorem, and Sampling Theorem

Circuit switching, message switching, packet switching, virtual circuit packet switching

Four components of delay in packet switching, traffic intensity and bottleneck

Little's Law, mean value and second moment formulas of a random variable

M/G/1 waiting time and delay formulas (two special cases), justification of packet switching over circuit switching

Internet layered architecture, encapsulation, de-encapsulation

Chapter 2 notes

Client-server vs P2P architecture

Sockets (welcome, connection, datagram), IP address and port number

DNS, FTP, HTTP, SMTP, P2P, DHT:

    Various DNS servers and various DNS records

    In-band vs out of band control, stateful vs stateless protocol

    HTTP client-server delay in terms of round-trip times - persistent vs, nonpersistent

    Cookies and proxy cache

    SMTP using ascii characters only - how to deal with it

    File distribution delay analysis to show why P2P is more scalable than client-server

    BitTorrent protocol, distributed hash table (DHT)

Chapter 3 notes

IP address and port numbers, multiplexing/demultiplexing

Services provided TCP and UDP

Internet checksum, TCP timeout interval estimation algorithms

Protocol design for Lossy FIFO and Lossy, Reordering, and Duplicative (LRD) channels

Alternating-bit protocol, pipelined protocols

sliding window protocol (principles and implementation in TCP)

ARQ, selective repeat, and go-back-N performance analysis

TCP three-way handshake protocol, SYN flood attack, connection close protocol

TCP flow control, TCP congestion control