**Review Exam 2**

**Ch3. Transport layer**

* Multiplexing and demultiplexing in transport layer
  + TCP and UDP sockets using port #
* Reliable data transfer; pipelining
  + ABT (a stop-and-wait protocol)
  + GBN (has pipelining)
  + SR (has pipelining)
* Congestion control principles
  + End-to-end CC
  + Network-assisted CC
* **UDP** 
  + Properties:
  + Segment fields: header size, checksum field, src and dst port #s
  + Who uses UDP?
* **TCP** 
  + Properties: reliable, full duplex, uses cumulated ACK, retransmission and fast retransmit, flow ctrl., congestion ctrl., compute segment # and their ACK #s, …
  + Segment fields: header size, checksum field, RcvWindow…
  + TCP congestion ctrl.: slow start; congestion avoidance; fast recovery

**Ch4. Network layer**

* Virtual circuit and datagram networks
* Switch architecture: input- output- ports; switching fabric; fwd-ing table
  + Queuing and packet loss
  + RED
* **IP**
  + IPV4 vs. IPv6; tunneling
  + Datagram fields:
  + CIDR and subnet addressing
  + DHCP
  + NAT
  + ICMP
* Routing alg.: LS (Dijkstra) and DV (Bellman-Ford eq.) alg.
* **Routing in Internet** 
  + Intra-AS: RIP and OSPF
  + Inter-AS (BGP) routing algorithms: eBGP and IBGP; AS-PATH; NEXT-HOP
* Broadcasting
  + N-way-unicast vs. Controlled flooding (Seq.-number-controlled flooding; RPF; Spanning-tree)
  + Multicast: using IGMP and Multicast Routing Protocol

Ch.1 Computer networks and the Internet

* Network edge and core
* Transmission, propagation, processing, and queuing delay
* Throughput
* Packet vs. circuit switching(FDM vs. TDM)
* 5-layer protocol stack of Internet

Ch.2 Application layer

* HTTP
* FTP
* SMTP
* DNS
* P2P