**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