

## **Review For Midterm:**

### Chapter 1:

- What In Internet
- BB Access Technologies – DSL, Cable Loop, Fiber, Wireless, Satellite, PL (Can Use The Diagram)
- How Many Layers In TCP/IP – 5 (Co, Cl)
  - CO (What It Is – Reliable)
- Data Network, Packet Network, IP Network
- Best Effort – CL
- L/R -
- Q Delay – Delay For The Nth Packet:  $(N-1) L/R$
- E2E Delay: Caravan (Packet)/Car (Bit):  $T_1 - T_2$  (10, 12, Pd)
- Traffic Intensity  $I = A/R$  (Stable/Unstable)
- Trace Route: What It Is, How It Works
- Delay :  $L/R$ ;  $D/S$
- Throughput: Def,  $\min(X, Y, Z)$  – Example (10 Simultaneous Downloads (S To C), Where A R Is Being Shared ( $R_s = 1 \text{ Mbps}$ ,  $R_c = 1 \text{ Mbps}$ ,  $R = 1 \text{ Mbps}$ ))
- Encapsulation: Segment, Datagram (Packet), Frame

### Chapter 2:

- Network Application
- C-S
- Socket (Process To Process)
- HTTP – Req/Resp ; Message Structure ; Two Types Of HTTP Connection – P And NP Advantages/Disadvantages- Problem Solving (RTT, L/R)
- URL
- Web Cache – What It Is, How It Works, Problem Solving (Given – L, A,  $R_a$ ,  $R_l$ ) :  $U = (A/R) \%$
- Cookies/Smtp/Email – (UA, Server, Protocol)
- DNS – What It Is ; How It Works; Iterative, Recursive Queries
- File Distribution Time- S -C; PEP; Bit Torrent
- Socket Programming (TCP Client Socket, TCP Server Socket):

### Chapter 3:

- Transport Layer – Logical Communication (CO/CL)- TCP/UDP)
- Rdt – FSM To Describe Action Taken By The Sender And Receiver (Transition Diagrams – Arrows)
  - Event/Action (4 Functions- )
  - All The Diagrams – Explain The Transition Conditions In Arrows
- Stop-Wait – ( It Makes Transmission Reliable, But .....)
  - Problem Solving – Given: R, RTT, A, L; Calculate  $U = \frac{L}{R} / (RTT + L/R)$ ;
  - Performance Explaining
  - Effective Throughput –  $L / ????$ ;
  - Pipelining – GBN And SR
    - GNB (How It Works) (Sliding Window/Shifting)/ SR
- Segment – SN – How To Calculate How Many Segments In The Stream Of Bytes, Sequence Number
  - Given Size Of The Byte Streams , MSS: How Many Segments, Sequence Numbering
- Flow Control Controlled By The Receiver– Def, How It Works, Formula  $Rwnd = Rcvbuffer - [X - Y]$
- Congestion Control Is Controlled By The Sender - Def, How It Works, Formula –  $Cwnd =$
- Two Types Of Method- Additive , Multiplicative (Saw Tooth)
- Fast Retransmit (Def, How It Works)
- Summary Of Congestion Control (Slow Start, Congestion Avoidance, Fast Recovery); Walk Through The Diagram And Explain Each Arrow