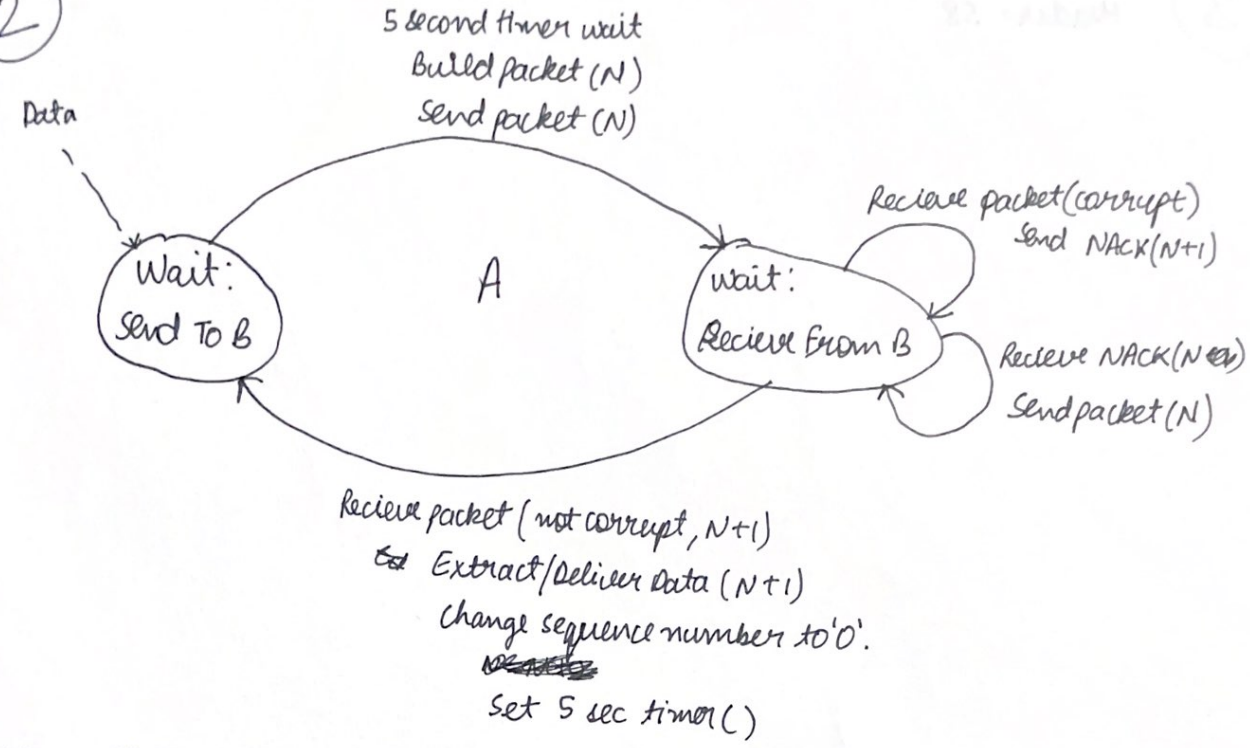
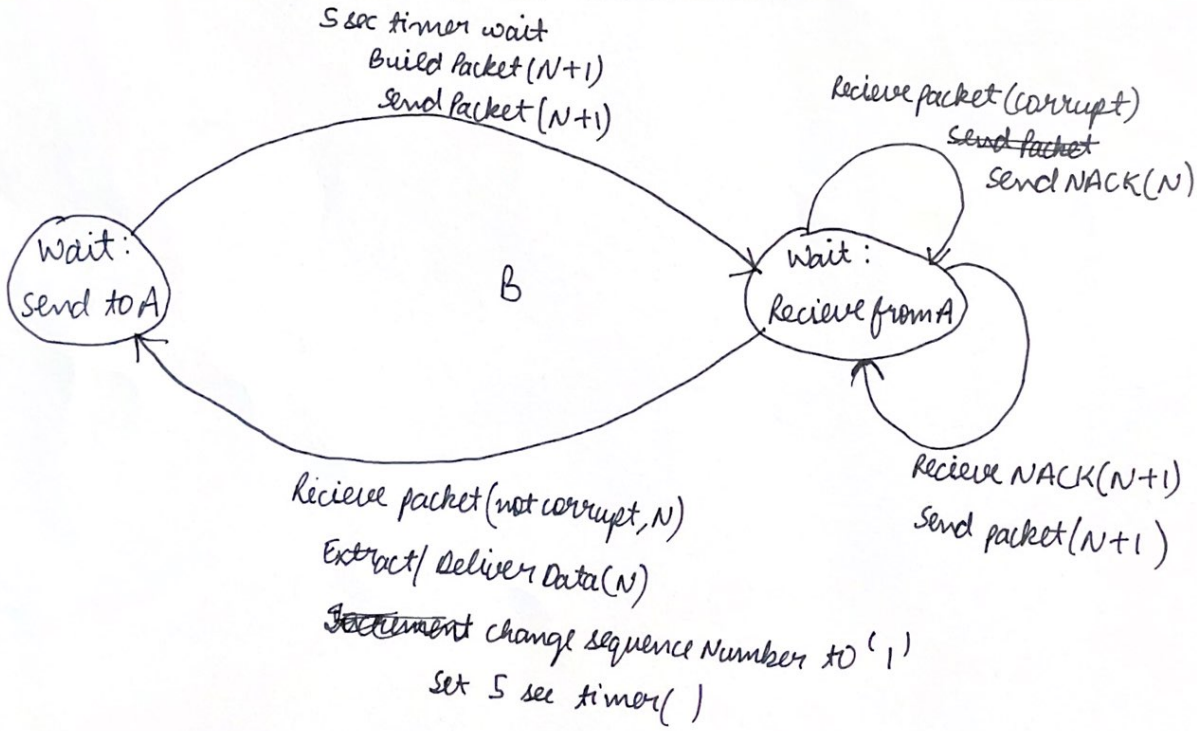
(2)


5 second timer wait
Build packet (N)
Send packet (N)
Data
Wait:
Send To B
A
Wait:
Recieve From B
Recieve packet (corrupt)
Send NACK(N+1)
Recieve NACK(N)
Send packet (N)
Recieve packet (not corrupt, N+1)
Extract/Deliver Data (N+1)
Change sequence number to '0'.
Set 5 sec timer()


5 sec timer wait
Build Packet (N+1)
Send Packet (N+1)
Wait:
Send to A
B
Wait:
Recieve from A
Recieve packet (corrupt)
Send NACK(N)
Recieve NACK(N+1)
Send packet (N+1)
Recieve packet (not corrupt, N)
Extract/ Deliver Data(N)
change sequence Number to '1'
Set 5 sec timer()

(3) Header = 58 bytes
Payload = 1542 bytes
Total size = 1600 bytes

Bit rate = $4(10)^6$ bytes/sec
Pack rate = 105 pack/sec
Line rate = $560(10)^6$ bytes/sec

(A) Max bit rate of channel = $4(10)^6$ bytes/sec)

Each packet = ~~1542 bytes~~ 1600 bytes

Pack per sec = ~~Packet~~ $\frac{\text{Bit Rate}}{\text{Pack size}} = \frac{4(10)^6 \text{ bytes/sec}}{1600 \text{ bytes/pack}} \Rightarrow 2500 \text{ pack/sec}$

~~$= 2594.03$ pack/sec~~

(B) Number = $\frac{\text{usage} * \text{capacity of line}}{\text{channel}}$

$= \frac{1(560 \text{ MB/s})}{4 \text{ MB/s}} = 140$ channels

(C) Average packet rate = 105 packets/sec

Max packet rate = ~~2594.03 packets/sec~~ 2500 packs per sec

Usage = $\frac{\text{Avg Rate}}{\text{Max Rate}} = \frac{105}{2594.03} = 0$ ~~0.04~~ $\Rightarrow$ ~~4%~~

~~(D)~~

$\text{floor}\left(\frac{105}{2500}\right) = 0.042 \Rightarrow 4.2\%$

(D) Avg bit rate

= no. of channels * avg. channel rate

= 140 (56) $\Rightarrow$ 7840 ~~bits/sec~~

$\Rightarrow$ 7840 pack/sec $\rightarrow$ (7840)(1600)(8) bits/sec $\Rightarrow$ 100,352,000 bits/sec

(E) Avg data rate.

= Avg bit rate * $\left(\frac{\text{data in pack}}{\text{size of pack}}\right)$

= ~~(7840)(~~

$\Rightarrow \left(100,352,000\right)\left(\frac{1542}{1600}\right)$

$\Rightarrow$ 96,714,240 bits/sec