CS & IT ENGINEERING

COMPUTER NETWORKS

Flow Control

Lecture No-7

By- Ankit Doyla Sir

- Sliding window concept
- GB-N ARQ

(1) maximum window size $= (1+2a)$

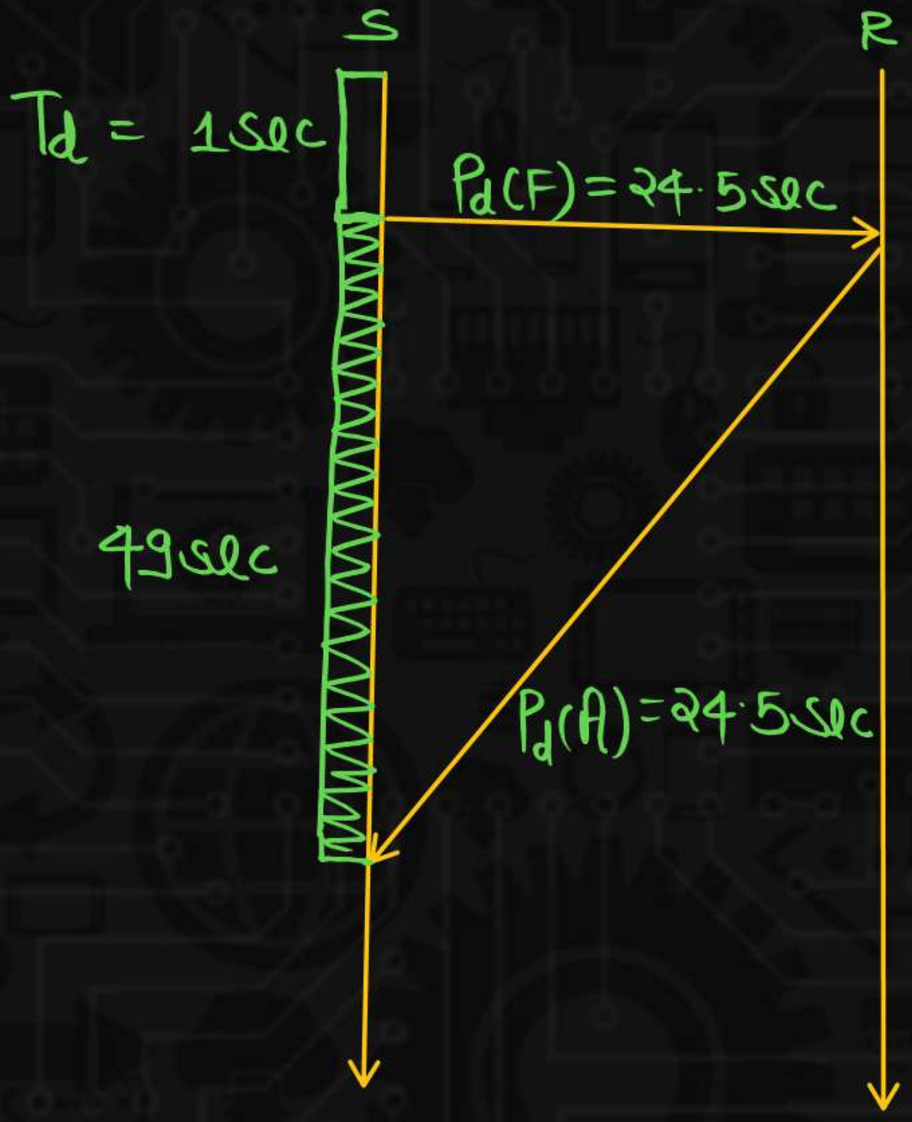
(2) minimum sequence No. required $= (1+2a)$

(3) minimum No. of bits required in the sequence No. field $= \lceil \log_2 (1+2a) \rceil$

Q: $T_d = 1\,sec$, $P_d = 24.5\,sec$

Soln: maximum window size $= (1+2a)$ Packet

$= 1 + 2 * \frac{24.5}{1} = 50$ Packet



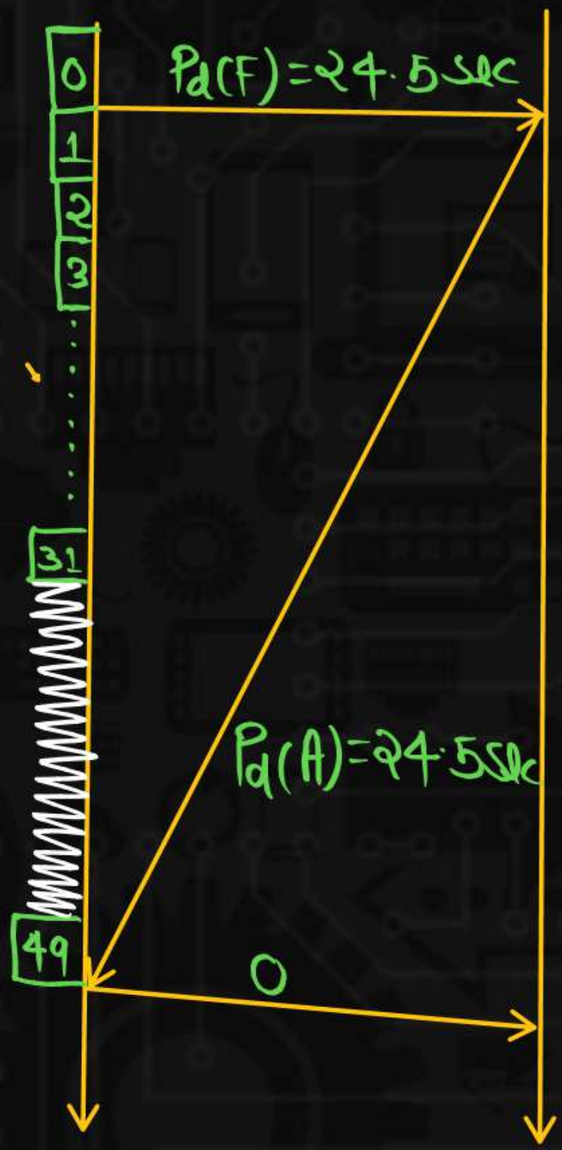
minimum sequence No. required $= (1+2a) = 50$

minimum No. OF bits required in the sequence No. field $= \lceil \log_2 (1+2a) \rceil$

$= \lceil \log_2 50 \rceil = \lceil 5.8 \rceil = 6$ bits

Case I If Seq No(K) = 5 bit

Total sequence No $= 2^5 = 32\ (0-31)$



Waiting time = 18 sec

$$\text{efficiency} = \frac{32}{50} = 0.64 = 64\%$$

$$W_s = \min\{(1+2a), 2^K\}$$

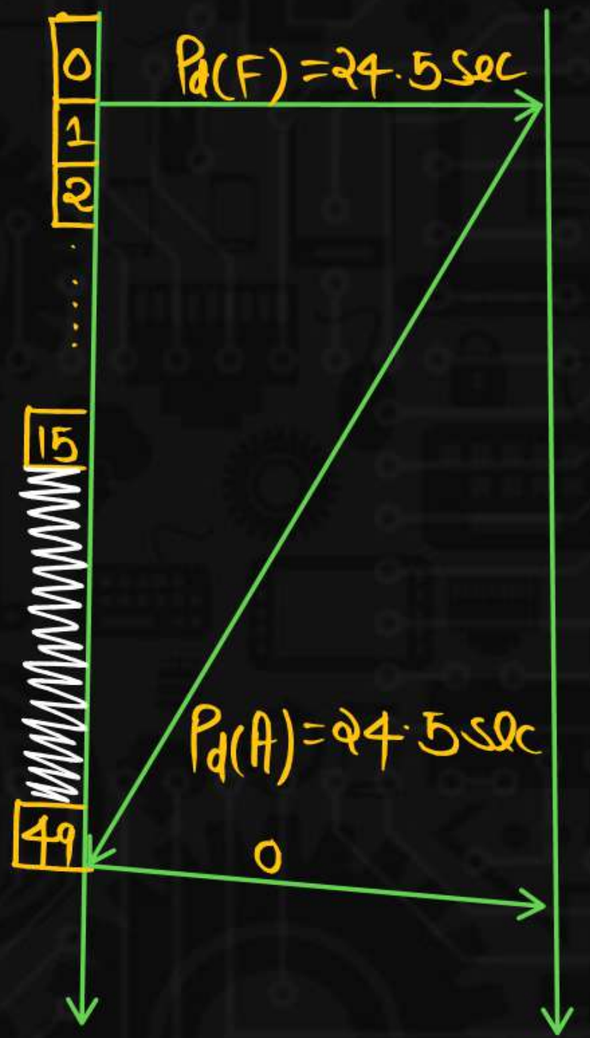
$$W_s = \min(50, 2^5)$$

$$W_s = \min(50, 32)$$

$$\boxed{W_s = 32}$$

Case II Seq No(K) = 4 bit

Total Seq No = $2^4 = 16$ (0 – 15)



Waiting time = 34 sec

$$\text{efficiency} = \frac{16}{50} = 0.32 = 32\%$$

$$W_s = \min\{(1+2a), 2^k\}$$

$$= \min\{50, 2^4\}$$

$$W_s = 16$$

Sliding window:

In the sliding window concept instead of sending one packet and wait for the acknowledgement, we send 'w' packet and wait for the Acknowledgement. Where 'w' is the sender window size.

GB-N (N>1)

1. In the GB-N the sender window size is N itself

   i.e GB-(5) → sender window size

2. In the GB-N the receiver window size is equal to one always ($w_R = 1$)

① GB-10

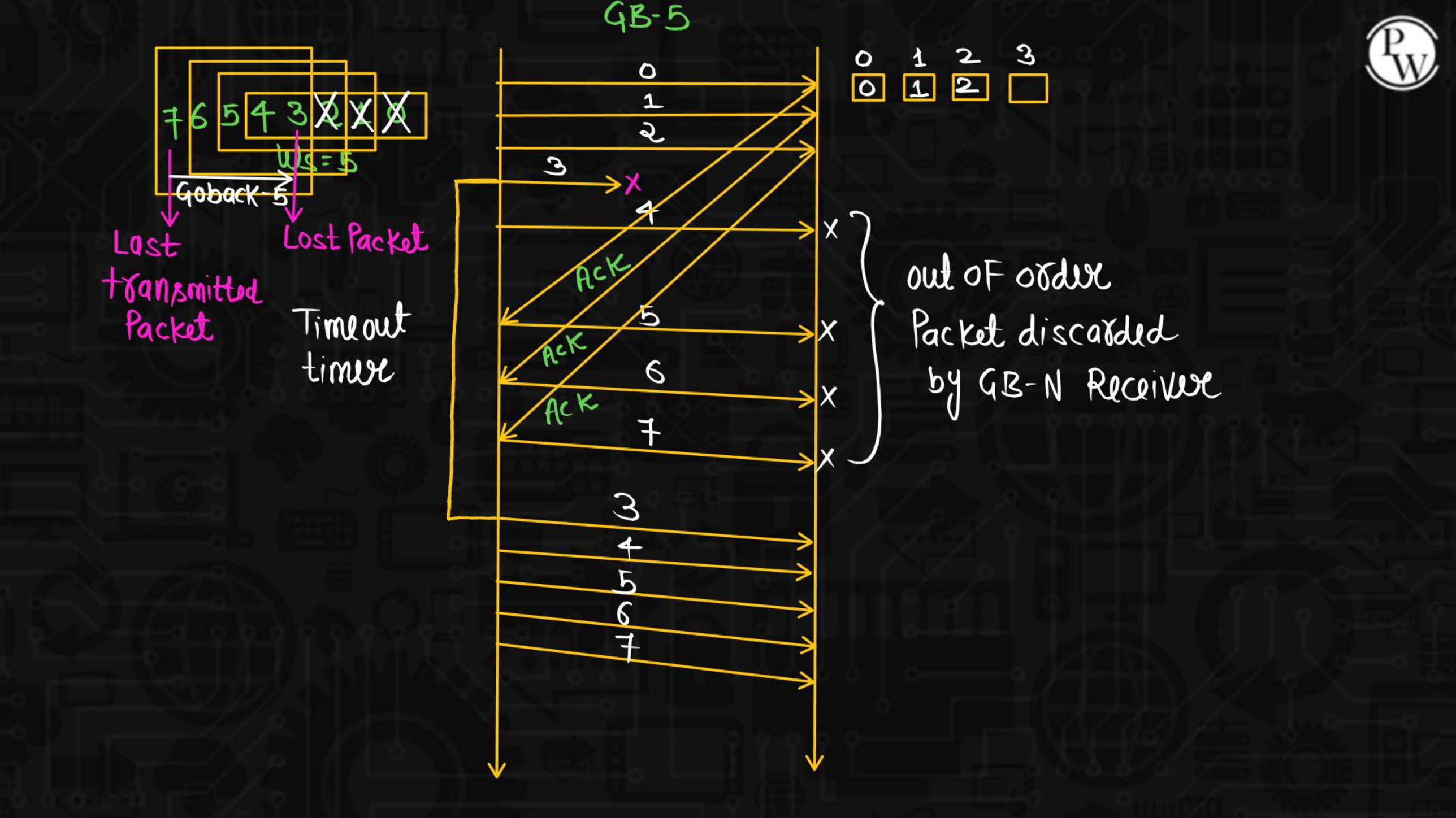
$w_S = 10$

$w_R = 1$

② GB-15

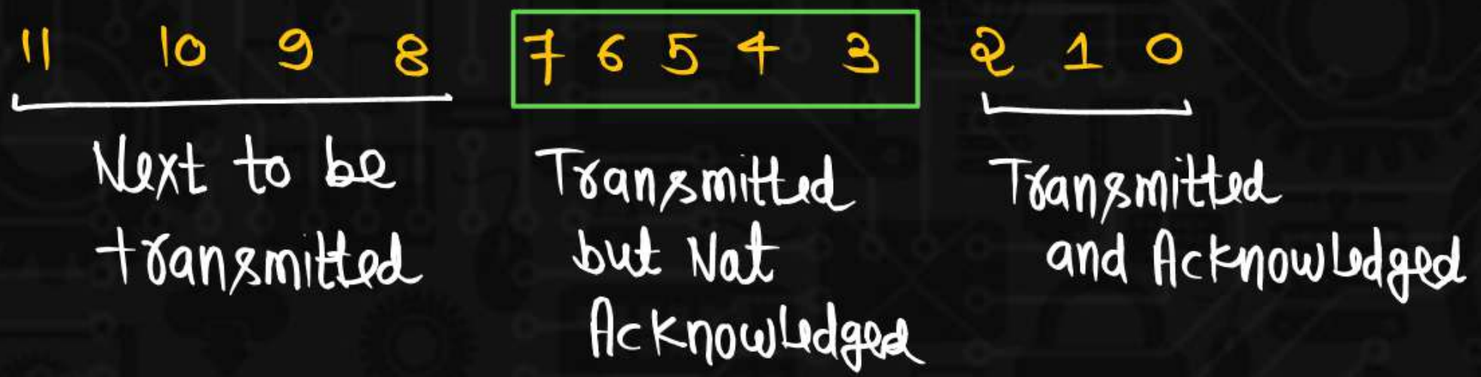
$w_S = 15$

$w_R = 1$


GB-5
7 6 5 4 3 X X X
Ws = 5
Goback-5
Last transmitted Packet
Lost Packet
Timeout timer
0 1 2 3
0 1 2
0
1
2
3
X
4
X
Ack
5
X
Ack
6
X
Ack
7
X
out OF order Packet discarded by GB-N Receiver
3
4
5
6
7

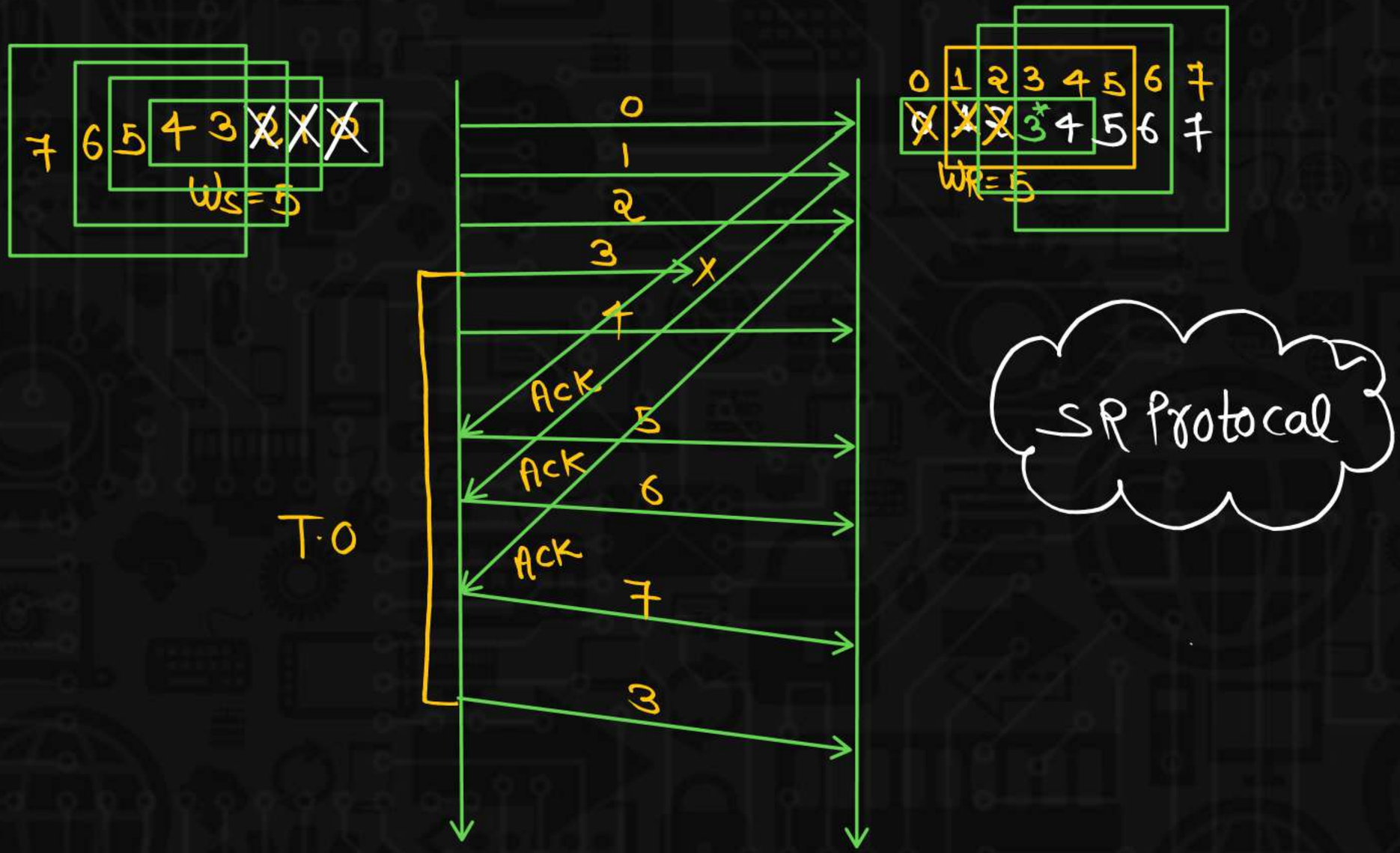
Note

① Go-Back-N is From Last transmitted Packet



NOTE

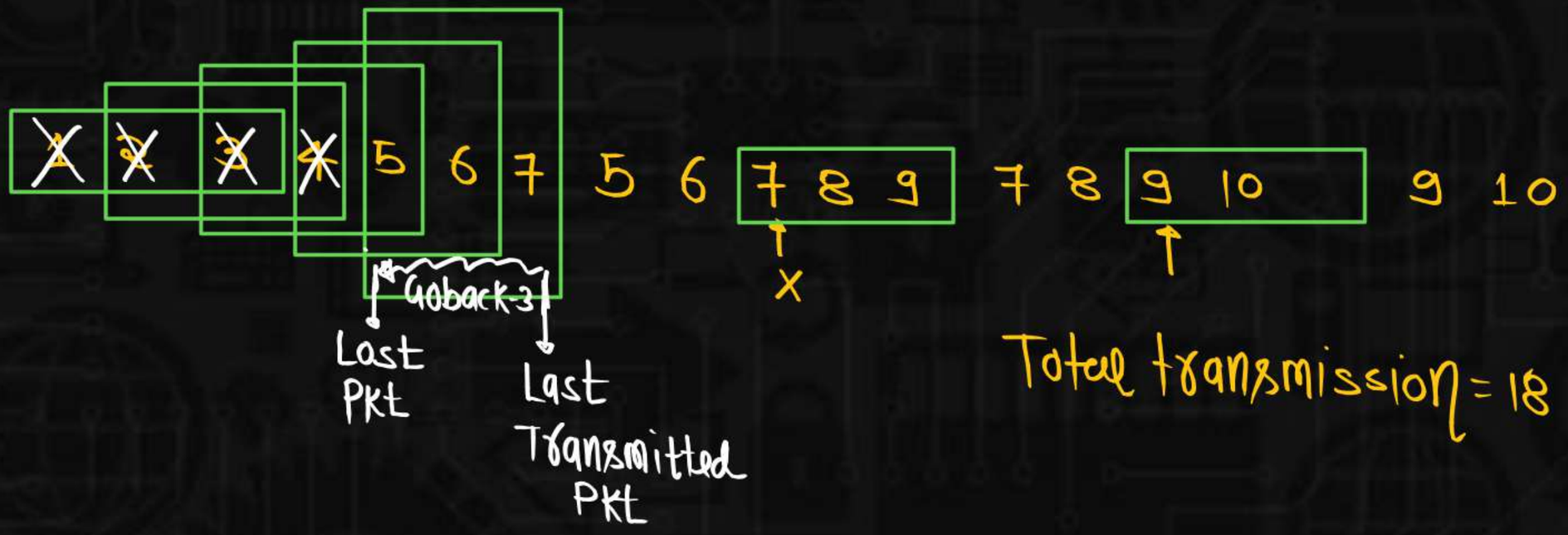
1. Out of order packet is not received by the receiver
2. Timer is maintained only for the first frame(Right most)in the window because if its timer expire then sender assume that rest of the frames are not received by the receiver(because out of order packet is rejected)


7 6 5 4 3 2 1 0
Ws=5
0 1 2 3 4 5 6 7
0 1 2 3* 4 5 6 7
WR=5
0
1
2
3
X
4
Ack 5
Ack 6
Ack 7
3
T.O
SR Protocal

Q.1

In GB-3, If every 5th packet that is being transmitted is lost and If we have to send 10 packet, then How many transmission are required

GB-3, 5th Lost, 10 Pkts



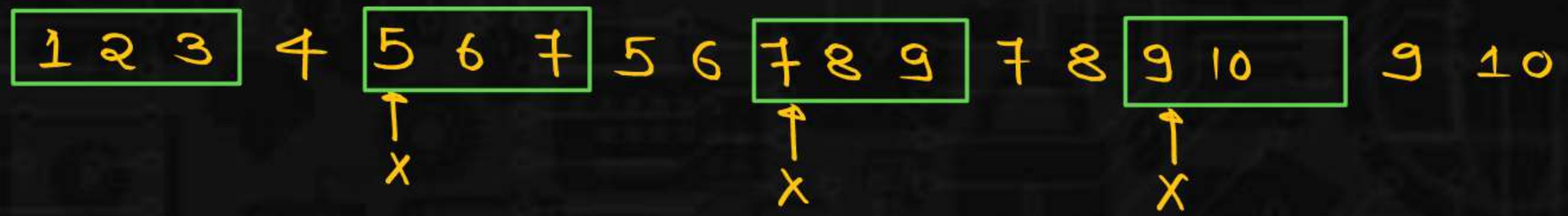
Total transmission = 18

Q.1

In GB-3, If every 5th packet that is being transmitted is lost and If we have to send 10 packet, then How many transmission are required

OR

GB-3, 5th Lost, 10Pkt

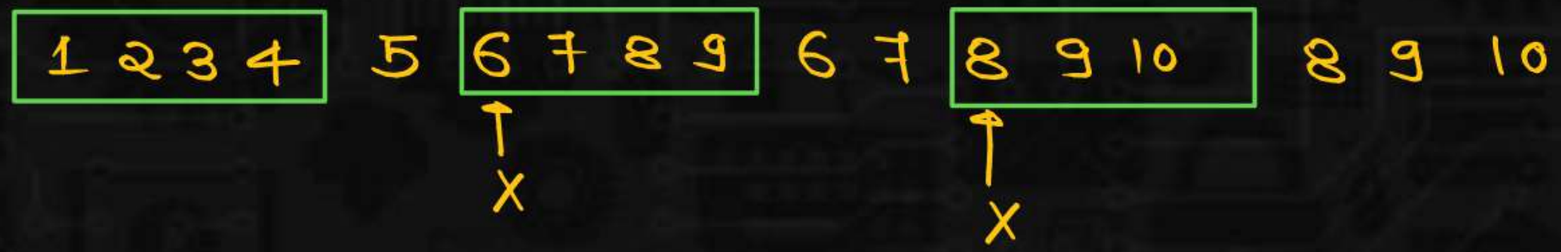


Total transmission = 18

Q.2

In GB-4 If every 6th packet that is being transmitted is lost and If we have to send 10 packet then how many total transmission are required.

GB-4, 6th lost, 10 Pkts



Total transmission = 17

Q.3

In GB-3, If every 4^{th} packet that is being transmitted is lost and if we have to send 10 packet then how many total transmission are required.

H.W

Ans: 27

Q.4

Station (A) needs to send a message of 9 packets where send windows = 3. All packets are ready and immediately available for transmission. By using GBN strategy, if every fifth packet gets lost, then what is the number of packets that station (A) will transmit for sending all its message _____.

Gate - 2016

Ans: 16

Q.5

Station A needs to send a message consisting of 15 packets to station 'B' using a sling window (window size 4) and go-back-N error control strategy. All packets are ready and immediately available for transmission. If every 6th packet that 'A' transmits gets lost (but no Acks from 'B' every gets lost), then what is the number of packets that 'A' will transmit for sending the message to 'B' ?

A 29

B 33

C 27

D 28


THANK YOU
GW
SOLDIERS !