Practice Questions CH#03
K19-1048 Amman Soomro

Question no: 01

- Most firewalls are configured to block UDP traffic, using TCP for voice and video traffic allows the traffic go through the firewalls.
- It leads to 100% delivery due to congestion control and reliability mechanisms.

Question no: 02

Host A: Source Port: 80, Source IP: b
Destination Port: 26145 dest IP: a

Host B: SP: 80 SIP: b
DP: 7532 DIP: c

Host C: SP: 80 SIP: b
DP: 26145 DIP: c

Question 03.

```
  01010011
+ 01100110
----------
  10111001
```

```
  10111001
+ 01110100
----------
  00101110
```

- One's Complement 11010001

Question no. 04

a)

```
  01011100
+ 01100101
----------
  11000001  → 00111110
```

b)

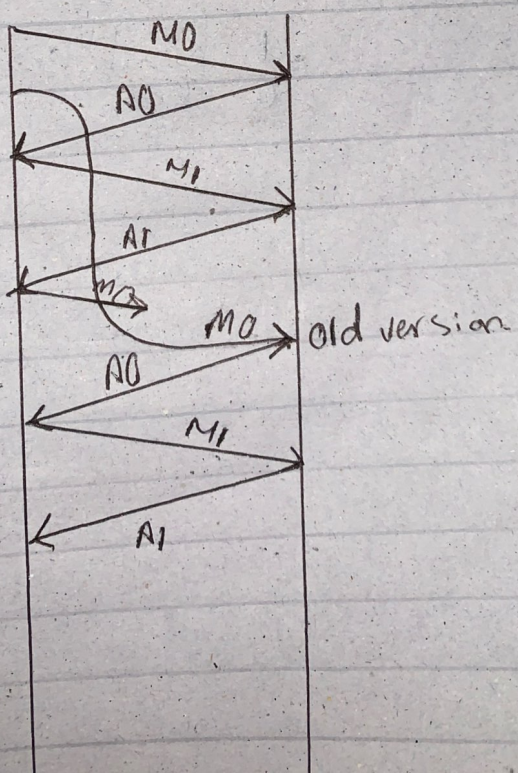
```
  11011010
+ 01100101
----------
  01000000  → 10111111
```

c) 01010100; 01101101

Question No: 05

Sequence no are needed so that the reciever can tell if the recieved data packet is a duplicate. Hence A duplicate ACK is obvious to rdt3.0 reciever, since when it has recieved the original ACK it transitioned to next state.

Question no: 0.8



Question NO: 11

a: $EstimatedRTT^{(4)} = x \times SampleRTT_1 +$
$(1-x) \times SampleRTT_2 +$
$(1-x)^2 \times SampleRTT_3 +$
$(1-x)^3 \times SampleRTT_4.$

b) $EstimatedRTT^{(n)} = x \sum_{j}^{n-1} (1-x)^{j-1} SampleRTT_j$

$+ (1-x)^{n-1} SampleRTT_n.$

c) $EstimatedRTT: \frac{x}{1-x} \sum_{j=1}^{\infty} (1-x)^j SampleRTT_j$

$= \frac{1}{9} \sum_{j=1}^{\infty} .9^j SampleRTT_j.$

Question No: 14.

Since the link capacity is only 100Mbps, so host A's sending rate can be at most 100Mbps. The receive buffer fills up at a rate of roughly 40Mbps when the buffer is full. Host B signals to Host A to stop sending data by setting rcvwindow = 0. Host A thus stops sending until it receives a TCP segment with RCV window > 0.

Question no: 15

a) Go Back N:

- A sends 9 segments in total. They are initially 1, 2, 3, 4, 5 and later re-sends 2, 3, 4, and 5.
- B sends 8 ACKs. They are 4 ACKs with seq no 1, and 4 ACKs with seq no 2, 3, 4 and 5.

b) Selective Repeat:

- A sends 6 segments in total. They are initially 1, 2, 3, 4, 5 and later re-sends segment 3.
- B sends 5 ACKS. They are 4 ACKs with seq no, 1, 3, 4, 5 and there is one Ack with seq no 2.

c) TCP:

- A sends a total of 6 segments in total, 1, 2, 3, 4, 5 initially, and 2 later.
- B sends 5 Acks, 4 ACKs with seq no 2 and 1 with seq no 6.

Question No 17

a) [1,6] and [23,26]
b) [6,16] and [17,22]
c) Triple duplicate ACK
d) Loss due to timeout
e) 32
f) 21
g) 14
h) 7th transmission round.
i) Threshold = 4 and window = 7
j) Threshold = 21 window size = 1
k) round 17, 1 packet, round 18 2 packet ...
round 20, 8 packets ... round 22 21 packets,
so total number is 52.

Question no: 18

a) It takes 1RTT to increase CongestionWin to 7MSS, 2RTT to 8MSS and 6RTT to 12 MSS

b) In the first RTT 6 MSS was send, 2nd RTT 7MSS was send then 8MSS, then 9MSS and so on 11MSS in 6th RTT, thus
6+7+8+9+10+11 = 51MSS were sent

Average throughput: $\frac{51MSS}{6RTT} \Rightarrow \frac{8.5MSS}{RTT}$