

1

Question No 2

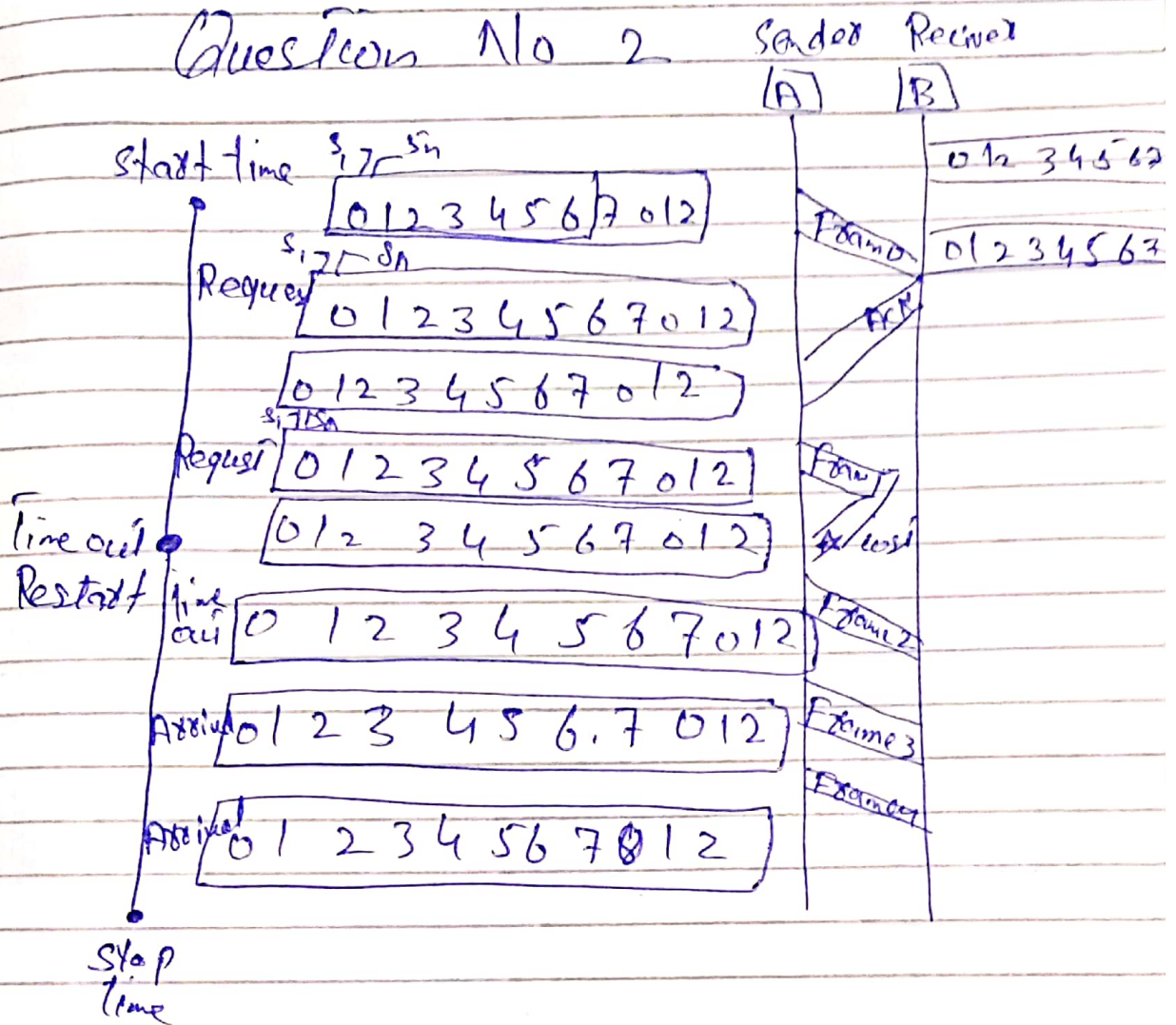


Figure 11.17. Show what happens when a frame is lost.

Frame 0, 1, 2 and 3 are sent. However frame 1 is lost. The receiver receives frames 2 and 3, but they are discarded because they are received out of order. The sender receives no acknowledgement about frame 1, 2, or 3. Its timer finally expires. The sender sends all outstanding frame (1, 2 and 3) because

2

it does not know what is wrong. Note that the retransmission of Frame 1, 2 and 3 is the response to one single event. When the sender is responding to this event, it cannot accept the triggering of other events. This means that when Ack 2 arrives the sender is still busy with sending Frame 3.

The Physical layer must wait until this event is completed and the data link layer goes back to its sleeping state. We have shown a vertical line to indicate the delay.

Note that before the second time expires, all outstanding frames have been sent and the timer is stopped.

3

Question No 3

bandwidth in bps = analog voice
 4×1000 bps
 $= 4000$

Now Calculate bit rate

$$2 \times B \times N = \text{bit rate}$$
$$2 \times 4000 \times 16 = 128000 \text{ bps}$$

in kbps = 128 kbps.

5

$32 - 7 = 25$. The addresses are
1st Customer: $10.100.127.0/25$ to $10.100.127.127/25$

2nd Customer = $10.100.127.0/25$ to $10.100.127.127/25$

128th Customer: $10.100.127.128/25$ to
 $10.100.128.255/25$

total $128 \times 128 = 16384$

3 Group 3:

For this group each customer needed 32 addresses. This means to each $6 (\log_2 32)$ bit are needed to each host. The prefix length is then $32 - 6 = 26$. The addresses are

1st Customer: $10.100.129.0/26$

2nd Customer: $10.100.129.32/26$

128th Customer: $10.100.159.160/26$

Total = $128 \times 32 = 4096$

Number of granted addresses to ISP
65536

Number of allocated addresses to ISP
28672

Number of available addresses
36864

5

Question No 5

IP addresses ('A': IP address; '10' MAC address)

