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Reg# 16549

Semester: 6th

Final Term Paper: Computer Communication & Networks

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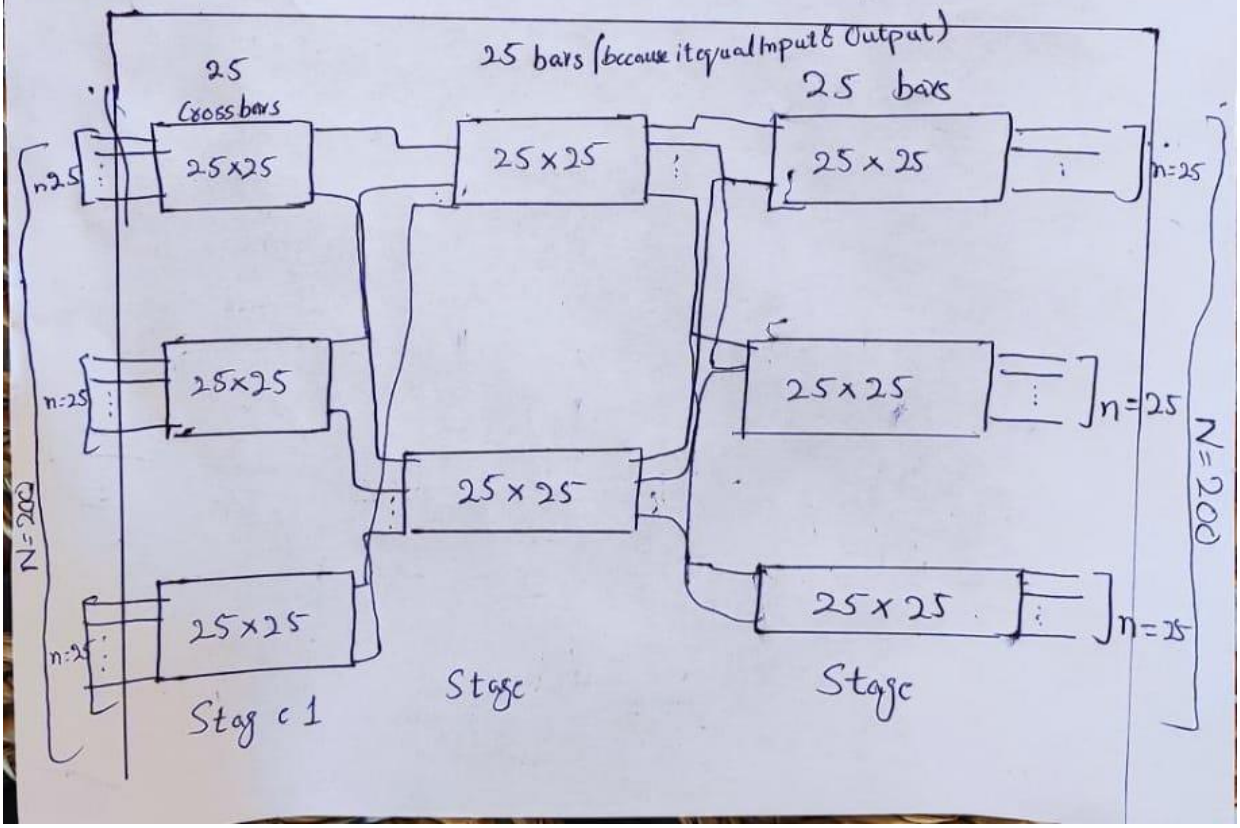
Q1:- We need a three-stage space-division switch with N = 200. We use 25 crossbars at the first and third stages.

- what is the number of crossbars at middle stage so that every mid-stage crossbar has equal inputs and outputs.
- Draw the configuration diagram and calculate the total number of cross points.
- Calculate the total number of cross points using clos criteria.

Ans:-



Total Number of Cross points.

$= 25(25 \times 25) + 25(25 \times 25) + 25(25 \times 25)$

$= 25(625) + 25(625) + 25(625)$

$= 15,625 + 15,625 + 15,625$

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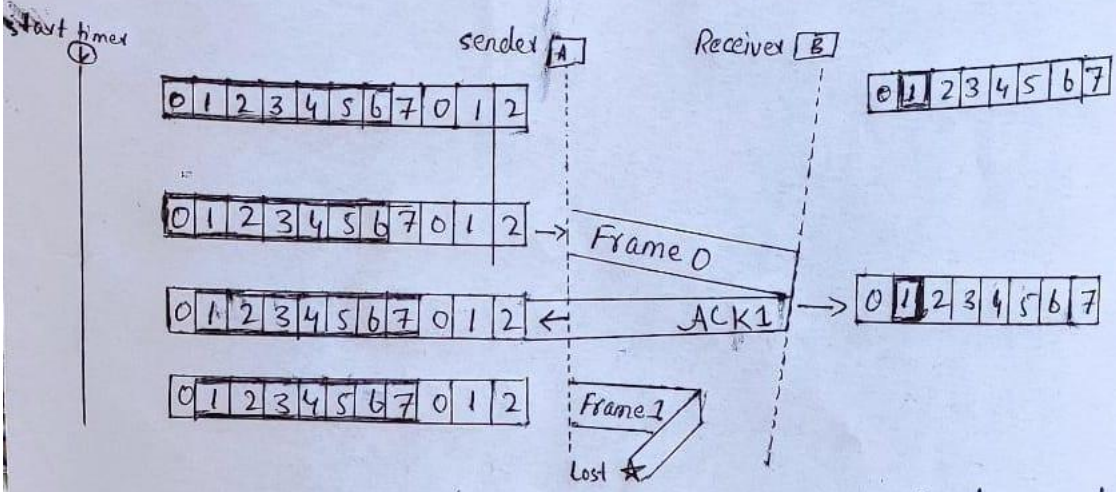
Q2:→ Explain and show graphically what will happen when Fram 1 is lost using Selective. Repeat ARQ.



Lets assume Frame no is courapted or lost so abviously The resiver will not sand Acnoledgment for frame No 1 - eilher The frame is lost or Acnoledgment will lost it go baek in ARQ what The resive will do. it is already resive frame No but it discard This frame and The sender with re transmiting all The frames in current window like 0 are repeater. in this case The resciver might have Acknoledge frame 0. but The sender will

will not send further frame because it knows that frame 1 is missing because the receiver would have send negative Acknoledgment for frame 1. so the Sender will re transmit frame 1 alone and as other frame will transmit.

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Q3:- A digitized voice channel is made by digitizing a 4-kHz bandwidth analog voice signal. We need to sample the signal at twice the highest frequency. We assume that each sample requires 16 bits. What is the required bit rate.

Ans:- The bit rate can be calculated as

$2 \times 4000 \times 16 = 128{,}000 \text{ bps} =$ 128 kbps

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Q4:- An ISP is granted a block of addresses Starting with 10.100.10.0/16

The ISP needs to distribute these addresses to three groups of Customer as follows:

- The first group has 64 customers; each needs 128 addresses.
- The second group has 128 customers; each need 128 addresses.
- The third group has 128 customers; each need 32 addresses.
- Design the Sub blocks & Find out how many addresses are still available after these allocations.

Ans:- For this group, each customer needs 128 addresses. This means that 7 (log2 128) bits are needed to define each host. The prefix length is then 32 − 7 = 25 The addresses are :-

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1st Customer :- 10.100.64.0/25 10.100.64.127/25

2nd Customer :- 10.100.64.128/25 10.100.64.255/25

⋮ ⋮

64th Customer : 10.100.127.128/25 190.100.127.255/25

Total = 64 × 128 = 8,192

Group:- 2:-

For this group, each customer needs 128 address. This means that 7 (log 2 128) bits are needed to define each host. The prefix length is then 32-7=25. The addresses are

1st Customer: 10.100.64.0/25 10.100.64.127/25

2nd Customer: 10.100.64.128/25 10.100.64.255/25

⋮ ⋮ ⋮ ⋮

128th Customer: 10.100.127.128/25 10.100.127.255/25

Total = 128 × 128 = 16,384

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Group 3:- For this group, each customer needs 32 addresses. This means that 5 ($\log_2 32$) bt are needed to define each host. The prefix length is then 32-5=27 The addresses are.

1st Customer:- 10.100.32.0/27 10.100.32.63/27

2nd Customer:- 10.100.32.0/27 10.100.32.128/27

⋮

32 Customer :- 10.100.32.64/27 10.100.32.128/27

Total= 32×128 = 4,096

Number of granted addresses to the ISP:- 65,536

Number of allocated addresses by the ISP: 28,672

Number of Available addresses: 36,864

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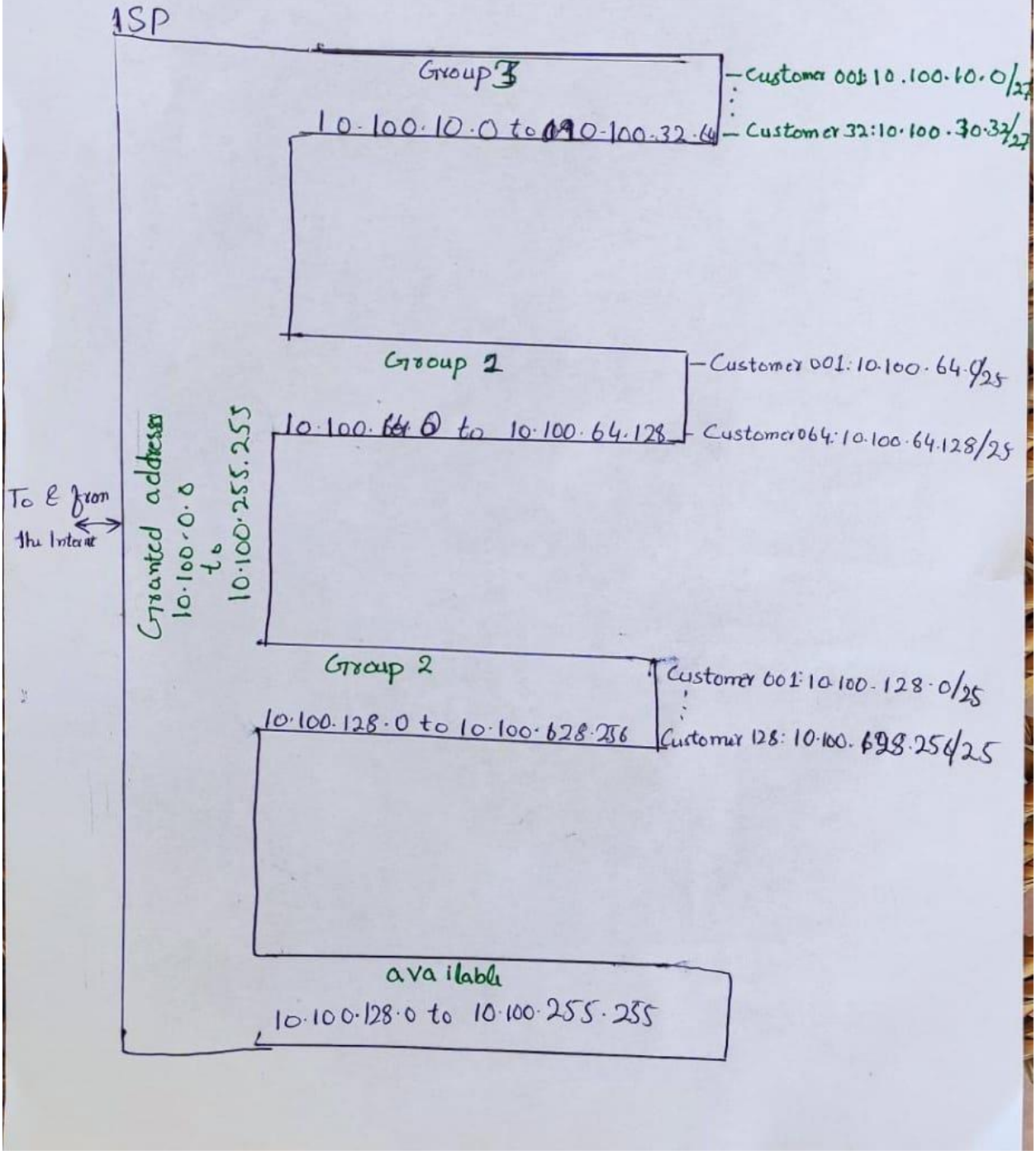
Design the Sub blocks



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Q5:- Below shows a part of an internet with two routers connecting three Lans. Each devise (computer or router) has a pair of addresses (logical & Physical) for each connection. Each router, however, is connected to three networks (only two are shown in the figure). so each router has three pairs of addresses, one for each connection. using the figure below fill in the missing information. Also explain each step.