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①

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(1)

Ans:-

My ID = 15089

X = 23

IP address = 101.10.11.X/ID₄₊₅

My IP address = 101.10.11.23/ID₈₊₉

IP address = 101.10.11.23/17

4th & 5th Digits is 8 & 9

Convert to Binary form

1100101 1010 1011 1011

Address Mask = 13

N = 32 - 17 = 15

First IP address.

1100000 0000 0000 00000

IP address.

101.10.11.0

Last IP address

11000111 1111 1111 11111

IP address

101.10.11.31

No of addresses in a block.

$$N = 2^{32-n}$$

$$N = 2^{32-17}$$

$$N = 2^{15}$$

$$N = 32768 \text{ Ans}$$

(2)

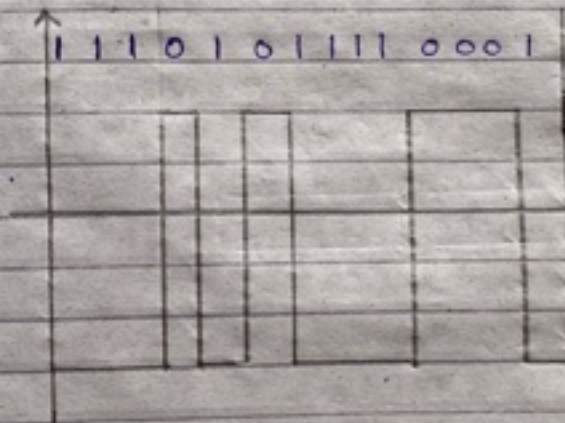
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(2) Take your Roll no as decimal and convert it into Binary notation. Assuming that the last signal level has been positive.

Answer =

ID = 15089

Decimal to Binary = 1110101110001



NRZ-L graph scheme

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(3)

Answer =

(a) before A sends any frames.

Sender =

0 1 2 3 | 4 5 6

sliding protocol transmit = 4 bits

Receiver =

0 1 2 3 | 4 5 6

(b) After a sender A frame 0, 1, 2, 3, 4 and receiver B for 0, 1, 2.

Sender =

It transmitted 5 but received

3. and keeping copy of one PDU.

Sender =

0 1 2 | 3 4 5 | 6

Acknowledgement
received 3-bits.

Receiver =

receive all data remain

0 1 2 | 3 4 5 | 6 4-bits.

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(c) After A sends frames 5, 6 and B acknowledge 5, the ACK is received by A.

Sender:

0 1 2 3 4 5 6 7 0 1

Receiver:

0 1 2 3 4 5 6 7 0 1

Received 3-bits

Now window size -

ID = 15089

Formula

$ID_{last} / 2$

$ID_{last} = 9$

$9/2 = 4$ window size

5

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4

Answer =

IP address = 160.23.17.0/16

(a)

Group first =

For this group each customer needs 64 addresses.

This means that 6 ($\log_2 64$) bit are needed to defined each

host. The prefix is the $32 - 6 = 26$

1st customer = 160.23.17.0/26 = 160.23.17.0/26

2nd customer = 160.23.17.1/26 = 160.23.17.128/26

3rd customer = 160.23.17.2/26 = 160.23.17.255/26

⋮

64th customer = 160.23.17.63/26 = 160.23.17.255/26

Total = $16 \times 64 = 1024$

(b)

Group second =

For this group each customer need 32 addresses.

means 5 ($\log_2 32$) = 5

$32 - 5 = 27$

1st customer = 160.23.17.0/27 = 160.23.17.0/27

Second customer = 160.23.17.1/27 = 160.23.17.255/27

Third customer = 160.23.17.2/27

64th customer = 160.23.17.63/27 = 160.23.17.255/27

Total = $64 \times 32 = 2048$

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(c) Third group =

For this group each customer needs 16 addresses

That mean $4 (\log_2 16)$ bit = 4
 $32 - 4 = 28$

1st customer = $160.23.17.0 / 28 = 160.23.17.128 / 28$

2nd customer = $160.23.17.4 / 28 = 160.23.17.255 / 28$

3rd customer = $160.23.17.8 / 28 =$

64th customer = $160.23.17.15 / 28 = 160.23.17.255 / 28$

Total = ~~64~~ $\times 16 = 1024$

Total = $16 \times 64 = 1024$

* End of paper *

