Q1

|  |  |  |  |
| --- | --- | --- | --- |
| 135 | 46 | 63 | 10 |
| 8 bit | 8 bit | 8 bit | 8 bit |
| Need all 8 bit | Need all 8 bit | 63 = (00111111)2  Need 22-16 = 6bit more , after that write as 0  = > 00111100=(60)10 | Don’t need more  Write as 0 |

A, from left to right : 135.46.63.10

= > 135.46.60.0/22 = >So the router will forward the packet to interface 1

B , from left to right : 135.46.63.10

|  |  |  |  |
| --- | --- | --- | --- |
| 135 | 46 | 57 | 10 |
| 8 bit | 8 bit | 8 bit | 8 bit |
| Need all 8 bit | Need all 8 bit | 63 = (00111111)2  Need 22-16 = 6bit more , after that write as 0  = > 00111000 = (56)10 | Don’t need more  Write as 0 |

= > 135.45.56.0/22

So the router will forward the packet to interface 0

Q4

Data 1001

Generator polynomial g(x) = x3 + x + 1 = x3 + x1 + x0

Generator polynomial as bit string format : 1011 ( n= 4bits)

Write(n-1) = 3 bit 0 after data bit string : we have f(x) = 100100

Calculate f(x) modulo-2 g(x) and find remainder of this calculation:

1 0 0 1 0 0 0 1011

+ 1 0 1 1 1010

1 0 0 0

1 0 1 1

R = 110

ADD (n -1) = 3 bit of R after data string

= > codeword corresponding to the preceding information sequence : 1 0 0 1 1 1 0

Q3

TCP/IP over ethernet allows data frames with a payload size up to 1460 byte.

Therefore , L= 100 , L =500, L= 1000 ARE within this LIMIT

The massage overhead includes :

TCP : 20 bytes of header

Ip : 20 byte of header

Ethernet : total 18 bytes of header and trailer

Therefore :

With L = 100, Efficiency = 100 /158 = 63.29%

With L = 500, Efficiency = 500/558 = 89.6%

With L = 1000, Efficiency = 1000/1058 = 94.5 %

Q5

A , WHEN STATION A SEND THE OLD SYN to station B , station B reply a ACK

Segment to station A. This ACK segment have same sequence number with a ACK segment before this sending time . This mean sequence number and it mean the connection is rejected.

B, it’s mean at the time before , station A send the SYN segment to station B. The time is late but station B also reply a ACK segment to A . follow it is the SYN segment re-send of station A . in this case , station A also receive 2 ACK segment have same sequence number because station B received 2 SYN segment and also replied it , it mean the connection is rejected . With L = 100, Efficiency