**Q1)**

135.46.56.0/22 interface 0

135.46.60.0/22 interface 1

1. 135.46.63.10   
   135.46. 0011 1111.10  
   135 and 46 each have 8 bits 8+8 = 16   
   -> (135.46.0011 11… is 22 bits other bits will turn to 0) 🡪135.46.0011 1100.00 = 135.46.60.0
2. -> The router will forward the packet with the IP 135.46.63.10 to Interface 1
3. 135.46.57.14   
   135.46. 0011 1001.14  
   135 and 46 each have 8 bits 8+8 = 16   
   -> (135.46.0011 10… is 22 bits other bits will turn to 0) 🡪135.46.0011 1000.00= 135.46.56.0  
   -> The router will forward the packet with the IP 135.46.63.10 to Interface 0

**Q2)**  
a) r = 2 since the polynomial is x +1

D + r = 1101100   
 10111011

11 11011000

11

01

11

10

11

11

11

00

11

11

11

00 🡪 fps

Codeword = D+fps =11011000

b)x^3 + x^2+1 🡪r = 3

D+r = 110110000

10011

1101 110110000

1101

1000

1101

1010

1101

111 🡪 fps

Codeword = D + fps= 110110111

**Q3)**

Message 20 bytes header  
Segment another 20 bytes header

Ethernet Frame 18 bytes of header and trailer.

🡪20+20+18 = 58 bytes

L = 100 🡪 Percentage = 100/(100+58) \* 100 = 63.29%(2 decimal point(d.p)) 63%

L = 500 🡪 Percentage = 500/(500+58) \* 100 = 89.60%(2 d.p) 90%

L = 1000 🡪 Percentage = 1000/(1000+58) \* 100 = 94.51%(2 d.p)  95%

**Q4)** g(x) = x^3 + x + 1 🡪 r = 3 -> D = 1011

r+D = 1011000

information sequence = 1001   
  
 1010

1001 1011000

1001

1000

1001

010🡪 fps

Codeword = D+fps =1011010

**Q5)**

a)In the three-way handshake, The old SYN segment from station A transfer to station B. The station B will look at the receive and compare the SYN from A and the current hold SYN of B. If the old SYN segment of A is difference from the SYN segment of B the SYN will be rejected and retrun the SYN back to A and the connection is rejected.

b) If the segment that send the ACK segment from A to the SYN of B. B will compare the ACK and SYN that receive from A. If the ACK and SYN is the difference. The ACK will be send back and the connection is rejected.