1a) MTU = 500

480 + 20 = 500 bytes

Now,

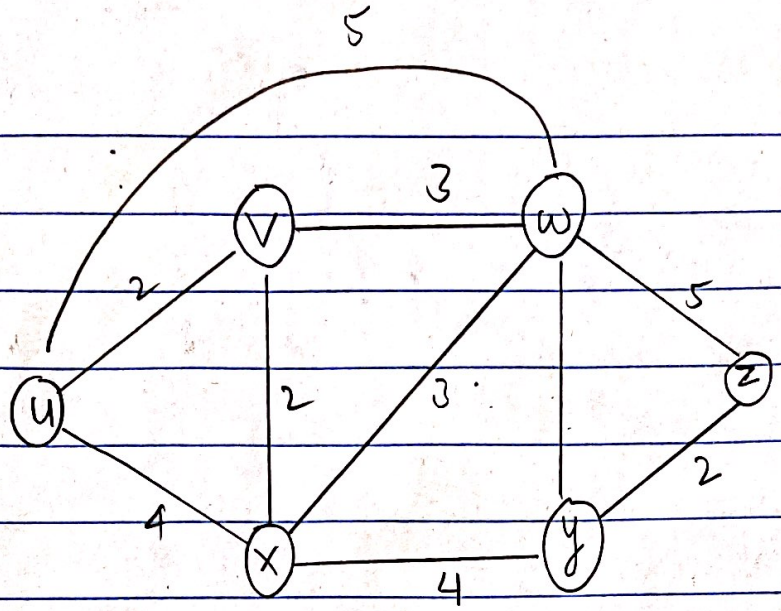
980 / 480 = 2.042 ≈ 3

So, 3 segments are generated from original datagram.

1b.

length	Id	Fragflag	offset
1000	x	0	0
500	x	1	0
500	x	1	60
20	x	0	120

(2)



step	N'	D(v) p(v)	D(w) p(w)	D(x) p(x)	D(y) p(y)	D(z) p(z)
0	u	2,u	5,u	4,u	∞	∞
1	u,v	2,u	5,u	4,u	∞	∞
2	u,v,x	2,u	5,u	4,u	8,x	∞
3	u,v,x,w	2,u	5,u	4,u	6,w	10,w
4	u,v,x,w,y	2,u	5,u	4,u	6,w	7,y
5	u,v,x,w,z	2,u	5,u	4,u	6,w	7,y

(3)

a)

1	1	1	1	1	1
0	0	0	0	0	0
1	1	1	1	1	1
0	0	0	0	0	0

b)

Yes, it can be corrected because single error would affect 2 parity bits so, it would be easy to locate and correct the error.

c) Yes, it can be corrected because a 2-bit error would affect a minimum of 2 parity bits so, the errors would be able to locate and be corrected.

(4)

Channel portioning

- Pros - we can share channel efficiently at high load
- Cons - it is insufficient at low load

Random Access

- Pros - efficient at low load
  - single node can fully utilize the channel
- Cons - There might be collision overhead at high load

⑤ Addres of

ⓐ mac source → 74-29-9C-E8-FF-55

mac destination → E6-E9-00-17-BB-4B

IP Source → 111.111.111.111

IP Destination → 222.222.222.222

ⓑ mac source → 1A-23-F9-CD-06-9B

mac destination → 49-BD-D2-C7-56-2A

IP Source → 111.111.111.111

IP Destination → 222.222.222.2222

ⓒ mac source → 74-29-9C-E8-FF-55

mac destination → CC-49-DE-D0-AB-7D

IP Source → 111.111.111.111

IP Destination → 111.111.111.112

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(6)

mac address is used to ensure the physical address of computer so, it is called physical address and it identifies the devices on a network while on the other hand IP address are used to identify the connection of network with that device take part in a network so, it is called logical address. Mac address operates in data link layer and it is hardcoded into a device at manufacturing so, it cannot be changed with time and environment while on other hand, IP address operates in network layer and it is assigned to device through software configuration so, it modifies with time and environment.