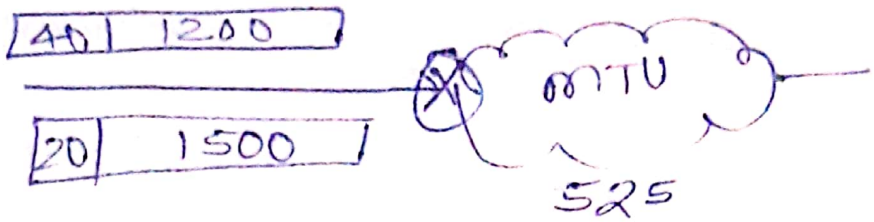
Q:- 

⇒ Two packets → 40|1200 & 20|1500

we fragment them seperately.

No. of fragments

525 - 40 = 485

max 485 byte data can be sent.

~~1200~~

~~(528-40)~~

⇒ valid data as per offset

~~485 mod 8~~

485 - 485 mod 8 = 480

11
5

* So the valid fragment size for 40|1200 is 480

* Total No of fragment ⇒ $\left\lceil \frac{1200}{480} \right\rceil = 3$

$\lceil 2.5 \rceil$

For 20|1500 → max data in MTU → 525-20 = 505

* valid data → 505 - 505 mod 8 = 504

* No of fragment = $\left\lceil \frac{1500}{504} \right\rceil = \lceil 2.97 \rceil = 3$

	P_1^1	P_2^1	P_3^1		P_1^2	P_2^2	P_3^2
Identification	A	A	A		B	B	B
Data	480 + 40	480 + 40	240 + 40				
DF	0	0	0	Data	504 + 20	504 + 20	492 + 20
MF	1	1	0	DF	0	0	0
				MF	1	1	0
offset	0	60	$\frac{480 \times 2}{8} = 120$	offset	0	63	126

40	1200

(480)

20	1500

(504)

* Now lets say these packets arrive at destination in a different order →

How to defragment them →

Steps of defragmentation algorithm :-

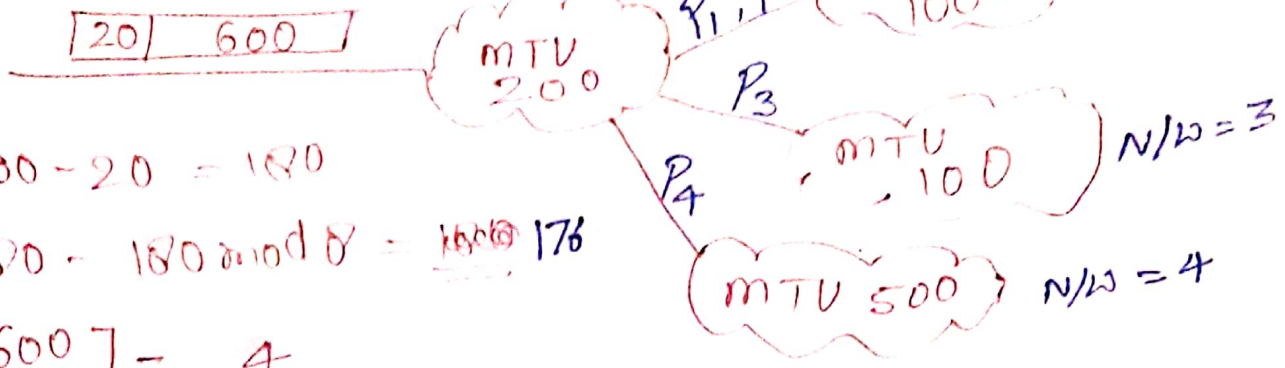
① Group all packets on the basis of identification

② offset ⇒ 0 mark 1st segment.

③ MF ⇒ 0 mark last segment.

④ find a fragment which offset = $\frac{\text{(data of first)}}{8}$ mark it 2nd. And so on.

* Fragmentation of a fragment :



200 - 20 = 180

180 - 180 mod 8 = 176

$\lceil \frac{600}{176} \rceil = 4$

	P_1	P_2	P_3	P_4
ID	A	A	A	A
Data	176 + 20	176 + 20	176 + 20	72 + 20
DF	0	0	0	0
MF	1	1	1	0
Offset	0	176/8 = 22	44	66

Now Lets assume packets further fragmented as per figure

⇒ For P_3 → Re fragmentation happen as →

⇒ 100 - 20 = 80

80 - 80 mod 8 = 80

$\lceil \frac{176}{80} \rceil = 3$

Now P_3 will be re-fragment as

	P_5	P_6	P_7
ID	A	A	A
Data	80 + 20	80 + 20	16 + 20
DF	0	0	0
MF	1	1	1 ← as it is an intermediate fragment (P_4 is after it)
offset	44	54	64

↑ offset = data ahead of this (i.e. P_1 & $P_2 = \frac{176 \times 2}{8} = 44$)

Total pkt ⇒ P_1 P_2 P_4 P_5 P_6 P_7 (No P_3)