

LAMPIRAN 1

PERHITUNGAN KAPASITAS SEL

Untuk menghitung kapasitas sel dapat diketahui dengan:

1. Untuk yang menggunakan OFDMA symbols :

n = Jumlah sub carrier x Tipe Modulasi

= (Jumlah RB x 12 x OFDMA Symbols) x Tipe Modulasi

n = Kapasitas Sel

2. Untuk yang langsung menghitung sub caarier :

n = Jumlah sub carrier x Tipe Modulasi

= (Jumlah RB x 12 x 15.0000 sps) x Tipe Modulasi

n = Kapasitas Sel

berikut perhitungannya :

A. Menggunakan OFDMA Symbols

1. Modulasi 4 QAM

$B = 1,4 \text{ MHz}$

$n = (6 \times 12 \text{ s}) \times 14 \times 10^3 \text{ sps} \times 2 \text{ bps} = 2,016 \times 10^6 \text{ bps}$

USER A

$$\text{Jumlah user} = \frac{2,016 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 4 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{2,016 \times 10^6 \text{ bps}}{1 \times 10^6} = 2 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{2,016 \times 10^6 \text{ bps}}{2 \times 10^6} = 1 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{2,016 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

B = 3 MHz

$$n = (15 \times 12 \text{ s}) \times 14 \times 10^3 \text{ sps} \times 2 \text{ bps} = 5,04 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{5,04 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 10 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{5,04 \times 10^6 \text{ bps}}{1 \times 10^6} = 5 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{5,04 \times 10^6 \text{ bps}}{2 \times 10^6} = 2 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{5,04 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 0$$

B = 5 MHz

$$n = (25 \times 12 \text{ s}) \times 14 \times 10^3 \text{ sps} \times 2 \text{ bps} = 8,4 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{8,4 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 16 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{8,4 \times 10^6 \text{ bps}}{1 \times 10^6} = 8 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{8,4 \times 10^6 \text{ bps}}{2 \times 10^6} = 2 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{8,4 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

B = 10 MHz

$$n = (50 \times 12 \text{ s}) \times 14 \times 10^3 \text{ sps} \times 2 \text{ bps} = 16,8 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{16,8 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 33 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{16,8 \times 10^6 \text{ bps}}{1 \times 10^6} = 16 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{16,8 \times 10^6 \text{ bps}}{2 \times 10^6} = 8 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{16,8 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

B = 15 MHz

$$n = (75 \times 12 \text{ s}) \times 14 \times 10^3 \text{ sps} \times 2 \text{ bps} = 25,2 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{25,2 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 50 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{25,2 \times 10^5 \text{ bps}}{1 \times 10^6} = 25 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{25,2 \times 10^5 \text{ bps}}{2 \times 10^6} = 12 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{25,2 \times 10^5 \text{ bps}}{100 \times 10^6} = 0$$

B = 20 MHz

$$n = (100 \times 12 \text{ s}) \times 14 \times 10^3 \text{ sps} \times 2 \text{ bps} = 33,6 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{33,6 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 67 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{33,6 \times 10^6 \text{ bps}}{1 \times 10^6} = 33 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{33,6 \times 10^6 \text{ bps}}{2 \times 10^6} = 16 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{33,6 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

2. Modulasi 16 QAM

B = 1,4 MHz

$$n = (6 \times 12 \text{ s}) \times 14 \times 10^3 \text{ sps} \times 4 \text{ bps} = 4,032 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{4,032 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 8 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{4,032 \times 10^6 \text{ bps}}{1 \times 10^6} = 4 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{4,032 \times 10^6 \text{ bps}}{2 \times 10^6} = 2 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{4,032 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

B = 3 MHz

$$n = (15 \times 12 \text{ s}) \times 14 \times 10^3 \text{ sps} \times 4 \text{ bps} = 10,08 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{10,08 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 20 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{10,08 \times 10^6 \text{ bps}}{1 \times 10^6} = 10 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{10,08 \times 10^6 \text{ bps}}{2 \times 10^6} = 5 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{10,08 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

$$B = 5 \text{ MHz}$$

$$n = (25 \times 12 \text{ s}) \times 14 \times 10^3 \text{ sps} \times 4 \text{ bps} = 16,8 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{16,8 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 33 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{16,8 \times 10^6 \text{ bps}}{1 \times 10^6} = 16 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{16,8 \times 10^6 \text{ bps}}{2 \times 10^6} = 8 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{16,8 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

$$B = 10 \text{ MHz}$$

$$n = (50 \times 12 \text{ s}) \times 14 \times 10^3 \text{ sps} \times 4 \text{ bps} = 33,6 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{33,6 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 67 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{33,6 \times 10^6 \text{ bps}}{1 \times 10^6} = 33 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{33,6 \times 10^6 \text{ bps}}{2 \times 10^6} = 16 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{33,6 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

$$B = 15 \text{ MHz}$$

$$n = (75 \times 12 \text{ s}) \times 14 \times 10^3 \text{ sps} \times 4 \text{ bps} = 50,4 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{50,4 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 100 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{50,4 \times 10^6 \text{ bps}}{1 \times 10^6} = 50 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{50,4 \times 10^6 \text{ bps}}{2 \times 10^6} = 25 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{50,4 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

$$B = 20 \text{ MHz}$$

$$\text{Jumlah user} = (100 \times 12 \text{ s}) \times 14 \times 10^3 \text{ sps} \times 4 \text{ bps} = 67,2 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{67,2 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 134 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{67,2 \times 10^6 \text{ bps}}{1 \times 10^6} = 67 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{67,2 \times 10^6 \text{ bps}}{2 \times 10^6} = 33 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{67,2 \times 10^5 \text{ bps}}{100 \times 10^6} = 0$$

3. Modulasi 64 QAM

B = 1,4 MHz

$$n = (6 \times 12 \text{ s}) \times 14 \times 10^3 \text{ sps} \times 6 \text{ bps} = 6,048 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{6,048 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 12 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{6,048 \times 10^6 \text{ bps}}{1 \times 10^6} = 6 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{6,048 \times 10^6 \text{ bps}}{2 \times 10^6} = 3 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{6,048 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

B = 3 MHz

$$n = (15 \times 12 \text{ s}) \times 14 \times 10^3 \text{ sps} \times 6 \text{ bps} = 15,12 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{15,12 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 30 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{15,12 \times 10^6 \text{ bps}}{1 \times 10^6} = 15 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{15,12 \times 10^6 \text{ bps}}{2 \times 10^6} = 7 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{15,12 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

B = 5 MHz

$$n = (25 \times 12 \text{ s}) \times 14 \times 10^3 \text{ sps} \times 6 \text{ bps} = 25,2 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{25,2 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 50 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{25,2 \times 10^6 \text{ bps}}{1 \times 10^6} = 25 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{25,2 \times 10^6 \text{ bps}}{2 \times 10^6} = 12 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{25,2 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

B = 10 MHz

$$n = (50 \times 12 \text{ s}) \times 14 \times 10^3 \text{ sps} \times 6 \text{ bps} = 50,4 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{50,4 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 100 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{50,4 \times 10^6 \text{ bps}}{1 \times 10^6} = 50 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{50,4 \times 10^6 \text{ bps}}{2 \times 10^6} = 25 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{50,4 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

B = 15 MHz

$$n = (75 \times 12 \text{ s}) \times 14 \times 10^3 \text{ sps} \times 6 \text{ bps} = 75,6 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{75,6 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 151 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{75,6 \times 10^6 \text{ bps}}{1 \times 10^6} = 75 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{75,6 \times 10^6 \text{ bps}}{2 \times 10^6} = 37 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{75,6 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

B = 20 MHz

$$n = (100 \times 12 \text{ s}) \times 14 \times 10^3 \text{ sps} \times 6 \text{ bps} = 100,8 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{100,8 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 201 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{100,8 \times 10^6 \text{ bps}}{1 \times 10^6} = 100 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{100,8 \times 10^6 \text{ bps}}{2 \times 10^6} = 50 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{100,8 \times 10^6 \text{ bps}}{100 \times 10^6} = 1 \text{ User}$$

B. Menggunakan sub carrier

1. Modulasi 4 QAM

$$B = 1,4 \text{ MHz}$$

$$n = (6 \times 12 \text{ s}) \times 15 \times 10^3 \text{ sps} \times 2 \text{ bps} = 2,16 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{2,16 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 4 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{2,16 \times 10^6 \text{ bps}}{1 \times 10^6} = 2 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{2,16 \times 10^6 \text{ bps}}{2 \times 10^6} = 1 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{2,16 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

$$B = 3 \text{ MHz}$$

$$n = (15 \times 12 \text{ s}) \times 15 \times 10^3 \text{ sps} \times 2 \text{ bps} = 5,4 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{5,4 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 10 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{5,4 \times 10^6 \text{ bps}}{1 \times 10^6} = 5 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{5,4 \times 10^6 \text{ bps}}{2 \times 10^6} = 2 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{5,4 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

B = 5 MHz

$$n = (25 \times 12 \text{ s}) \times 15 \times 10^3 \text{ sps} \times 2 \text{ bps} = 9 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{9 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 18 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{9 \times 10^6 \text{ bps}}{1 \times 10^6} = 9 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{9 \times 10^6 \text{ bps}}{2 \times 10^6} = 4 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{9 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

B = 10 MHz

$$n = (50 \times 12 \text{ s}) \times 15 \times 10^3 \text{ sps} \times 2 \text{ bps} = 18 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{18 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 36 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{18 \times 10^6 \text{ bps}}{1 \times 10^6} = 18 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{18 \times 10^6 \text{ bps}}{2 \times 10^6} = 9 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{18 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

B = 15 MHz

$$n = (75 \times 12 \text{ s}) \times 15 \times 10^3 \text{ sps} \times 2 \text{ bps} = 27 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{27 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 54 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{27 \times 10^6 \text{ bps}}{1 \times 10^6} = 27 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{27 \times 10^6 \text{ bps}}{2 \times 10^6} = 13 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{27 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

$$B = 20 \text{ MHz}$$

$$n = (100 \times 12 \text{ s}) \times 15 \times 10^3 \text{ sps} \times 2 \text{ bps} = 36 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{36 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 72 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{36 \times 10^6 \text{ bps}}{1 \times 10^6} = 36 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{36 \times 10^6 \text{ bps}}{2 \times 10^6} = 18 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{36 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

2. Modulasi 16 QAM

$$B = 1,4 \text{ MHz}$$

$$n = (6 \times 12 \text{ s}) \times 15 \times 10^3 \text{ sps} \times 4 \text{ bps} = 4,32 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{4,32 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 8 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{4,32 \times 10^6 \text{ bps}}{1 \times 10^6} = 4 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{4,32 \times 10^6 \text{ bps}}{2 \times 10^6} = 2 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{4,82 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

$$B = 3 \text{ MHz}$$

$$n = (15 \times 12 \text{ s}) \times 15 \times 10^3 \text{ sps} \times 4 \text{ bps} = 10,8 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{10,8 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 21 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{10,8 \times 10^6 \text{ bps}}{1 \times 10^6} = 10 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{10,8 \times 10^6 \text{ bps}}{2 \times 10^6} = 5 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{10,8 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

$$B = 5 \text{ MHz}$$

$$n = (25 \times 12 \text{ s}) \times 15 \times 10^3 \text{ sps} \times 4 \text{ bps} = 18 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{18 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 36 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{18 \times 10^6 \text{ bps}}{1 \times 10^6} = 18 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{18 \times 10^6 \text{ bps}}{2 \times 10^6} = 9 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{18 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

B = 10 MHz

$$n = (50 \times 12 \text{ s}) \times 15 \times 10^3 \text{ sps} \times 4 \text{ bps} = 36 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{36 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 72 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{36 \times 10^6 \text{ bps}}{1 \times 10^6} = 36 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{36 \times 10^6 \text{ bps}}{2 \times 10^6} = 18 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{36 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

B = 15 MHz

$$n = (75 \times 12 \text{ s}) \times 15 \times 10^3 \text{ sps} \times 4 \text{ bps} = 54 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{54 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 108 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{54 \times 10^6 \text{ bps}}{1 \times 10^6} = 54 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{54 \times 10^6 \text{ bps}}{2 \times 10^6} = 27 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{54 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

B = 20 MHz

$$n = (100 \times 12 \text{ s}) \times 15 \times 10^3 \text{ sps} \times 4 \text{ bps} = 72 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{72 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 144 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{72 \times 10^6 \text{ bps}}{1 \times 10^6} = 72 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{72 \times 10^6 \text{ bps}}{2 \times 10^6} = 36 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{72 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

3. Modulasi 64 QAM

B = 1,4 MHz

$$n = (6 \times 12 \text{ s}) \times 15 \times 10^3 \text{ sps} \times 6 \text{ bps} = 6,48 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{6,48 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 13 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{6,48 \times 10^5 \text{ bps}}{1 \times 10^6} = 6 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{6,48 \times 10^5 \text{ bps}}{2 \times 10^6} = 3 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{6,48 \times 10^5 \text{ bps}}{100 \times 10^6} = 0$$

B = 3 MHz

$$n = (15 \times 12 \text{ s}) \times 15 \times 10^3 \text{ sps} \times 6 \text{ bps} = 16,2 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{16,2 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 32 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{16,2 \times 10^6 \text{ bps}}{1 \times 10^6} = 16 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{16,2 \times 10^6 \text{ bps}}{2 \times 10^6} = 8 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{16,2 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

B = 5 MHz

$$n = (25 \times 12 \text{ s}) \times 15 \times 10^3 \text{ sps} \times 6 \text{ bps} = 27 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{27 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 54 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{27 \times 10^6 \text{ bps}}{1 \times 10^6} = 27 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{27 \times 10^6 \text{ bps}}{2 \times 10^6} = 13 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{27 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

B = 10 MHz

$$n = (50 \times 12 \text{ s}) \times 15 \times 10^3 \text{ sps} \times 6 \text{ bps} = 54 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{54 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 108 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{54 \times 10^6 \text{ bps}}{1 \times 10^6} = 54 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{54 \times 10^6 \text{ bps}}{2 \times 10^6} = 27 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{54 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

B = 15 MHz

$$n = (75 \times 12 \text{ s}) \times 15 \times 10^3 \text{ sps} \times 6 \text{ bps} = 81 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{81 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 162 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{81 \times 10^6 \text{ bps}}{1 \times 10^6} = 81 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{81 \times 10^6 \text{ bps}}{2 \times 10^6} = 40 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{81 \times 10^6 \text{ bps}}{100 \times 10^6} = 0$$

B = 20 MHz

$$n = (100 \times 12 \text{ s}) \times 15 \times 10^3 \text{ sps} \times 6 \text{ bps} = 108 \times 10^6 \text{ bps}$$

USER A

$$\text{Jumlah user} = \frac{108 \times 10^6 \text{ bps}}{0,5 \times 10^6} = 216 \text{ User}$$

USER B

$$\text{Jumlah user} = \frac{108 \times 10^6 \text{ bps}}{1 \times 10^6} = 108 \text{ User}$$

USER C

$$\text{Jumlah user} = \frac{108 \times 10^6 \text{ bps}}{2 \times 10^6} = 54 \text{ User}$$

USER D

$$\text{Jumlah user} = \frac{108 \times 10^6 \text{ bps}}{100 \times 10^6} = 1 \text{ User}$$