

Correction

Total bandwidth: 8 MHz
Channel bandwidth: 180 kHz
Guard band: 20 kHz
Reserved bandwidth: 5%

1. Calculate the usable bandwidth. [1.5 pts]

Reserved bandwidth = $5\% \times 8 \text{ MHz} = 0.4 \text{ MHz}$
Usable bandwidth = $8 - 0.4 = 7.6 \text{ MHz}$

Answer: 7.6 MHz

2. Determine the maximum number of channels. [1.5 pts]

Bandwidth per channel = $180 + 20 = 200 \text{ kHz}$
Number of channels = $7600 / 200 = 38$

Answer: 38 channels

3. Calculate the total bandwidth lost. [1.5 pts]

Reserved bandwidth = 0.4 MHz
Guard bands = $(38 - 1) \times 20 \text{ kHz} = 740 \text{ kHz} = 0.74 \text{ MHz}$

Total lost = $0.4 + 0.74 = 1.14 \text{ MHz}$

Answer: 1.14 MHz

4. Calculate the spectral efficiency (%). [1.5 pts]

Useful bandwidth = $38 \times 180 \text{ kHz} = 6840 \text{ kHz} = 6.84 \text{ MHz}$

Efficiency = $(6.84 / 8) \times 100 \approx 85.5\%$

Answer: 85.5%