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1. $f_m = 5\ kHz$

$T_{Ant} = 300\ k$

Parameter pradeteksi

$G = 17\ dB$

$T_e = 1700\ k$

$BW = 25\ kHz$

a. $\frac{S_B}{N_B} = 50\ dB = 100.000 = \frac{S_A}{k\,(T_{Ant} + T_e)\,BW_N}$

$$S_A = 100.000 \times k\,(T_{Ant} + T_e).\,BW_N$$

$$S_A = 100.000 \times 1,38 \times 10^{-23}(300 + 1700) \times 25 \times 10^3$$

$$S_A = 6,9 \times 10^{-11}\ W$$

b. $m = 60\% = 0,6$

AM-DSB-SC

$$\frac{S_c}{N_c} = \frac{S_i}{\eta f_m} = \frac{S_A}{k\,(T_{Ant} + T_e)\,f_m} = \frac{6,9 \times 10^{-11}}{1,38 \times 10^{-23}(300 + 1700).\,5 \times 10^3}$$

$$\frac{S_c}{N_c} = 500.000$$

$$\frac{S_c}{N_c} = 10.\log(500.000)$$

$$\frac{S_c}{N_c} = 57\ dB$$

AM-DSB-FC

$$\frac{S_c}{N_c} = \frac{m^2}{2 + m^2} \cdot \frac{S_i}{\eta . f_m} = \frac{0,6^2}{2 + 0,6^2} \cdot 500.000$$

$$= 76.271,19$$

$$\frac{S_c}{N_c} = 10.\log(76.271,19) = 48,82\ dB$$