13. zad

P_{uk} = 1.2 W

T_1 = 1 µs

T_2 = 8 µs

$$20\log\frac{a_0}{a_1} = -5\ dB$$

$$20\log\frac{a_2}{a_1} = -5\ dB$$

$$r(t) = a_0 * s(t) + a_1 * s(t - T_1) + a_2 * s(t - T_2)$$

$$\frac{a_0}{a_1} = 10^{-5/20} => a_1 = 1.7783 * a_0$$

$$a_0 = a_2$$

$$P_{uk} = a_0^2 + a_1^2 + a_2^2 = 1.2 \quad => a_0 = 0.48213\ V = a_2\ ,\ a_1 = 0.85737\ V$$

$$P_0 = a_0^2, \qquad P_1 = a_1^2, \qquad P_2 = a_2^2$$

$$T_{sr} = \frac{\sum_{k=0}^{2} P_k T_k}{\sum_{k=0}^{2} P_k} = \frac{0.23245*0+0.73508*1+0.23245*8}{1.2} = 2.1622\text{µs}$$

$$T_{sr}{}^2 = \frac{\sum_{k=0}^{2} P_k T_k{}^2}{\sum_{k=0}^{2} P_k} = \frac{0.23245*0^2+0.73508*1^2+0.23245*8^2}{1.2} = 13.01\ (\mu s)^2$$

$$T_{RMS} = \sqrt{T_{sr}^2 - (T_{sr})^2} = \sqrt{13.01 - 2.1622^2} = 2.887\text{µs}$$

$$B_L \cong \frac{1}{5T_{RMS}} = 69.276\ kHz$$

U zadatku je zadano da pojas mora biti širok barem 200 kHz da bi se simboli prenosili bez interferencije, pa zaključujemo da ih je nemoguće prenijeti s našim kanalom koji je širok samo 69.276 kHz.