a) We can sample at a rate of \( f_s = 2W \) to retrieve the message signal. In this way, we have demodulated.

\[ x(t) \]

b) \( x(t) \) passes through a BPF and an LPF, resulting in \( w(t) \) with \( T_s = \frac{1}{2W} \).
c) Noise powers add. Out of the channel, noise power is
\[ \frac{N_0}{2} + 2W_0 \cdot 2 = 7N_0W \]

Quantization power:
\[ \frac{1}{12} \left( \frac{2\alpha A}{2^6} \right)^2 \text{power}(m(t)) \cdot \frac{1}{3} \frac{\alpha^2 A^2}{2^{2b}} \text{power}(m(t)) \]

Signal power:
\[ \frac{\alpha^2 A^2}{2} \text{power}(m(t)) \]

\[ \text{SNR} = \frac{\alpha^2 A^2 \text{power}(m(t))}{\frac{1}{2} 7N_0W + \frac{1}{3} \frac{\alpha^2 A^2}{2^{2b}} \text{power}(m(t))} = \frac{3\alpha^2 A^2 \text{power}(m(t))}{12N_0W + 2^{-2b+1} \alpha^2 A^2 \text{power}(m(t))} \]