

1. (10 pts Total) Consider one-dimensional 4-point Amplitude Shift Keying (ASK):

$$s_i = 2i - 5, \quad i = 1, 2, 3, 4.$$

The received signal is given as $z = s_i + n$, where n is Laplacian noise with pdf

$$f(n) = (1/2)e^{-|n|}.$$

- (a) (2 pts) Determine the signal-to-noise ratio (SNR) in dB of this system.
- (b) (1 pts) How many information bits are transmitted per modulation interval?
- (c) (7 pts) Determine the symbol error probability, p_e , of this system (assuming minimum distance decoding).