

- (5) 1 Suppose that a PAM adopts the following symbol constellation. The members of each set B chosen equally-likely. Find the constant c that makes

$$E\{|d[m]|^2\} = 1.$$

(M-PAM)

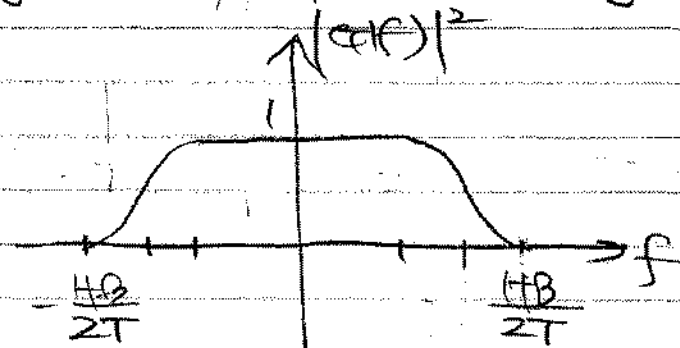
- (a) $d[m] \in \{c(-M+1), c(-M+3), c(-M+5), \dots, c(M-3), c(M-1)\}$
where $M > 1$.

(b) (16-PAM)

$$d[m] \in \{c(a+jb) \mid a, b \in \{-3, -1, 1, 3\}\}$$

- (10) 2 Using MATLAB, generate 100 points at random in $[0, 1] \times [0, 1]$, then plot the Voronoi cells.

- (20) 3 Suppose that $g(t)$ is the SRRC pulse with the following energy spectral density



Using MATLAB, draw the following.

- (a) Generate $\{d[m]\}_{m=-100}^{m=100}$ with $\Pr(d[m]=1) = \Pr(d[m]=-1)$
an i.i.d. sequence

$= 1/2$, then, draw

$$S(t) = \sum_{m=-100}^{100} d[m] g(t-mT) \quad \text{for } -50 \leq t \leq 50$$

where $T=1$, $\beta=0, 0.5$, and 1 .

(b) Use the same sequence $\{d[m]\}_{m=-100}^{100}$ used in (a) to draw

$$S(t) * g(-t) \quad \text{for } -50 \leq t \leq 50$$

where $T=1$, $\beta=0, 0.5$, and 1 .

(c) Using $S(t)$ for $-50 \leq t \leq 50$ generated in (a) plot the eye diagrams for $\beta=0, 0.5$, and 1 with the time span being 2 symbol periods.

(d) " " " " " (b)

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