For a system using Fast FHSS, with 100 users, each generates data with rate 10 Kbps. The sequence generation has a length of 4 bits. Find the error probability of such system if the hop rate is five times the symbol rate.

Sol:

$*$ $R_h = 5 R_s$ → $T_s = 5 T_h$ → Fast FH

$*$ 4 bits Seq. Generator → $N_f = 16$

$N_R = T_s / T_h \equiv \text{\# of hops/symbol}$ → 5

# of frequencies

∴ $P_e = \sum_{i=3}^{5} {}^5C_i \; P_{hit}^{i} \; (1 - P_{hit})^{5-i}$

$\text{Majority} = \left\lceil \frac{N_h}{2} \right\rceil$

Samy Soliman

Same as for slow FH.

$P_{hit} = 1 - \left(1 - \frac{1}{N_f}\right)^{K-1}$ ← # users

$= 1 - \left(1 - \frac{1}{16}\right)^{99}$

$= \ldots\ldots$

$$\boxed{P_e = {}^5C_3 \; P_{hit}^{3} \; (1 - P_{hit})^{2} + {}^5C_4 \; P_{hit}^{4} \; (1 - P_{hit}) + {}^5C_5 \; P_{hit}^{5}}$$

You have to Calculate

→ **Note:** N_f Can be obtained also as: $N_f = \frac{W}{2 R_b}$ ← system BW