

Erlang = Cells per hour  $\times$  Mean Holding Time of call (Hour)

$$E = \frac{BHCA \times MHT(\text{sec})}{3600} \quad ; \text{ time = seconds}$$

$$= 2 \text{ calls/hr} \times \frac{3}{60}$$

$$= 0.1 \text{ Erl}$$

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2. Signal power,  $S = -97 \text{ dBm} = 10^{-9.7} \text{ mW}$   
 Noise " ,  $N_b = -117 \text{ dBm} = 10^{-11.7} \text{ mW}$   
 Interfering signal, CCI =  $-120 \text{ dBm} = 10^{-12} \text{ mW}$

a)  $\frac{S}{I} = \frac{S}{6 \times \text{CCI} + N_b} = \frac{10^{-9.7}}{6 \times 10^{-12} + 10^{-11.7}}$

b)  $\frac{S}{I} \approx 24.96$   
 $\approx 14 \text{ dB}$   
 $= 15.2 \text{ dB}$

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c)  $20 \text{ dB} = 10^2 = 100 \text{ mW}$

$$\frac{S}{I} = \frac{S}{6 \times \text{CCI}}$$

$$\Rightarrow 100 = \frac{10^{-9.7}}{6 \times \text{CCI}}$$

$$\Rightarrow \text{CCI} = 3.33 \times 10^{-13} \text{ mW}$$

$$\approx -124.8 \text{ dBm}$$

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Prob-7

$$\frac{S}{I} = \frac{1}{6} \left( \frac{D}{R} \right)^v \quad P_b \propto \frac{1}{R^v}$$

$$P_{\text{CCI}} \propto \frac{1}{6} \cdot \frac{1}{D^v}$$

$$\Rightarrow \frac{D}{R} = \left( 6 \times \frac{S}{I} \right)^{\frac{1}{v}}$$

$$= (6 \times 100)^{\frac{1}{3}}$$

$$= 8.43$$

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Prob-12

Provider A:

20 channels/cell

GOS = 2%

Offered traffic = 13.182 [using Erlang B Table]

Carried  $\psi = 13.182 \times 0.98$   
 $= 12.92 \text{ Erl}$

$\therefore$  total carried traffic =  $12.92 \times 100 = 1292 \text{ Erl}$

$\therefore$  total Subs =  $\frac{1292}{0.1} = 12920$

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Provider B

offered traffic = 43.997 Erl

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