First Exam Sheet

$N = i^2 + j^2 + i\,j$,

$SIR_{dB} = 10\log\left(\frac{\left(\sqrt{3N}\right)^n}{i_o}\right)$ $\quad i_o = 6, 2, 1$ {Omni-directional, 120-sect, 60-sect}

$A_u = \lambda H$ (Average user traffic), $\quad P\left[delay > t\right] = P\left[delay > 0\right] e^{-\frac{C-A}{H}t}$

$P\left[delay > t \,|\, delay > 0\right] = e^{-\frac{C-A}{H}t}$, Average delay for a call= $P\left[delay > 0\right]\frac{H}{C-A}$

$P_{rec}(d) = \frac{P_t G_t G_r \lambda^2}{(4\pi)^2 d^2 L}$ {Free-space Model}, $\lambda = c / f_c$, $EIRP = P_t G_t$

Free space Path Loss $PL(dB) = -10\log\frac{G_t G_r \lambda^2}{(4\pi)^2 d^2}$ or $PL(dB) = -10\log\frac{\lambda^2}{(4\pi)^2 d^2}$

$Power(dBm) = 10\log\left(\frac{Power(Watt)}{0.001}\right)$

Two-Ray Model : Exact: $P_{rec}(d) = 4P_t G_t G_r \left(\frac{\lambda}{4\pi d}\right)^2 \sin^2\left(\frac{2\pi h_t h_r}{\lambda d}\right)$

For large d: $P_{rec}(d) = P_t G_t G_r \frac{h_t^2 h_r^2}{d^4}$

Fresnel Zones: $v = h\sqrt{\frac{2(d_1+d_2)}{\lambda d_1 d_2}}$ OR $v = \alpha\sqrt{\frac{2d_1 d_2}{\lambda(d_1+d_2)}}$

Radius of the n-th Fresnel Zones $r_n = \sqrt{\frac{n\lambda d_1 d_2}{d_1+d_2}}$