# Result

By developing a simulator which models the actual system, the actual throughput of the system is calculated. The analytical throughput is computed and then actual and analytical throughput is compared graphically.

➢ **Calculating the analytical throughput**

The analytical throughput is computed as follows:

$$P = 1 - (1 - \tau)^{n-1}$$

$$\tau = \frac{2(1 - 2P)}{(1 - 2P)(w + 1) + Pw(1 - (2P)^m)}$$

$$P_{tr} = 1 - (1 - \tau)^n$$

$$P_s = \frac{\binom{n}{1} \tau (1 - \tau)^{n-1}}{P_{tr}}$$

$$T_s = T_{RTS} + T_{CTS} + T_{packet} + T_{ack} + 3SIFS + DIFS$$

$$T_c = T_{RTS} + DIFS$$

$$Average\ Packet\ Playloed\ Size = E[P] = 100$$

And with finding p, τ, Ps, Ptr, Ts, Tc, the throughput S can be calculated using the equation below:

$$S = \frac{P_s P_{tr} E[P]}{(1 - P_{tr})\sigma + P_{tr} P_s T_s + P_{tr}(1 - P_s)T_c}$$

➢ **Comparing result of analytical and actual throughput**

The below diagram that presents the throughput for analytical and actual methods shows good agreement between these two methods. The differences between the two diagrams can be justified by the unsimilarity of the simulation's environment and the model's assumptions. Also, the throughput of a system depends on many factors, including collision probability, busy probability, and the number of stations.