Credit Hours System
Advanced Topics on Communications II (ELCN 456)
Communications and Computer Engineering
Spring 2019
Problem Set no. 1

Question 1

In a telecommunication trunking system, it is required to provide a GoS in terms of a probability of blocking no more than 0.1%. The system follows the Erlang B formula, and 10 trunks are available.

1) If each user makes on average 6 calls per hour, with an average call duration of 2 minutes, what is the maximum number of users that can be supported by that system?
2) It is now required to double the capacity of the system, how many additional trunks are required to be installed?
3) If the additional trunks are not installed, what will be the resulting GoS?

Question 2

How many users can be supported for 0.5% blocking probability for the following number of trunked channels in a blocked calls cleared system? (a) 1, (b) 5, (c) 10, (d) 20, (e) 100.
Assume each user generates 0.1 Erlangs of traffic.

Question 3

In a trunking Erlang C system with a 5% probability of delayed call, the total number of trunks is 15. If the load per user is 0.029 Erlangs and the average number of call requests is 1 call/hour.

1) How many users will this system support?
2) What is the probability that a delayed call will have to wait more than 10 seconds?
3) What is the probability that a call will be delayed for more than 10 seconds?

Question 4

Consider the connection of modules with the input signals shown in the figure
Find the output power, Po, in dBm.