EN642 Power Generation and Systems Planning
ASSIGNMENT #2

1. (a) You are taking a 10 question multiple choice test. If each question has four choices and you guess on each question, what is the probability of getting exactly 7 questions correct?
(Use binomial coefficients, the failure probability is 0.75 for each question. Although, questions are not identical the probability of failure is same, therefore, binomial coefficient can be used.)
(b) Repeat part (a) if questions are replaced by true-false questions.

2. A system has three units A, B & C of capacity 70MW, 140 MW and 280 MW, respectively. Forced outage rates (FOR) of these units are 0.02, 0.07 and 0.09, respectively.

(a) Compute an outage state enumeration table with probabilities of each state.

(b) Compute cumulative outage table using probabilities in part (a)

(c) Compute table in part (b) using convolution method. [Note that the results are same irrespective of the order in which units are added]

(d)What is the probability of not meeting the load of 120 MW? What is the probability of not meeting the load of 380 MW?

(e) Using loss of energy probability (LOEP) method find expected unserved load for a 120 MW load.

(f) Calculate annual LOLP for a constant peak load of 120 MW for the year.