Assignment 3 – EE 3TQ3
Section CO2
Due Date: Dec 2nd , 8:30 a.m.

Q1: Let X be exponentially distributed random variable with $\lambda = 1$ and let Y be Gaussian distributed with mean μ and variance σ^2. Find

a) distribution of Z=X+Y
b) distribution $f_{X|Z}$

Q2: Let X and Y be independent Gaussian distributed random variables with mean 0 and variance 1. Find

a) Joint pdf of U=2X+Y and V=-Y.
b) Conditional distribution of V|U
c) Find probability $P[V < -3 \mid U > 1)$

Q3: Let small powerhouse have two hydro-generators G1 and G2 and let life expectancy of stator coil be exponentially distributed with expected values 35 and 40 years respectively. Let cost of repair for generator 1 be Gaussian distributed with mean 35 million dollars and variance 4. Similarly, let the cost of repair for generator 2 be Gaussian distributed with mean 34.5 million and variance 1. Assuming that only one failure per generator is possible find the expected value of the repair cost in the first year.