Lab Assignment - 3

Instructor: Dr. Arabin Kumar Dey

1 Due date:

- 7/2/2013.

2 Notes:

- Make a proper documentation preferably in latex or using some other software and submit the printout of the report in .pdf form.

- Each student needs to write his/ her own solutions, even though discussions of the assignments between students are encouraged.

- Use all codes in R.

3 Assignments:

1. Generate 1000 standard normal variates using standard Double-exponential distribution by acceptance-rejection method. Calculate the necessary constant c, where $\frac{f(x)}{g(x)} \leq c$, $f(x)$ and $g(x)$ are the pdfs of standard normal and standard Double-exponential distribution respectively. Calculate the theoretical and simulated acceptance probability. How do you justify your generated random numbers are correct ? Provide as many verification as you can.

2. Do the same exercise for generating random numbers from half-standard normal distribution using exponential distribution with mean 1 by acceptance-rejection method.

3. Consider the following discrete distribution.

j	1	2	3	4	5
p_j	0.05	0.25	0.45	0.15	0.10

a) Generate 10 random numbers from the above probability mass function using usual procedure (inverse transform) of generating random number from discrete distribution defined on finite number of points. Calculate mean and variance of the generated numbers.

b) Generate 10 random numbers from the same probability mass function by acceptance-rejection principle. Calculate mean and variance of the generated numbers.