THAPAR INSTITUTE OF ENGINEERING AND TECHNOLOGY, PATIALA

Department of Electronics and Communication Engineering

UEC310 – Information and Communication Theory

TUTORIAL - 7

Q1	Let $\{X(t), t \in [0,\infty)\}$ be defined as $X(t) = A + Bt, for\ all\ t \in [0,\infty)$, where A and B are independent normal N(1,1) random variables. Find • All possible sample functions for this random process. • Define the random variable Y=X(1). Find the PDF of Y. • Let also $Z = X(2)$. Find $E[YZ]$.
Q2	Consider the random process $\{X_n, n = 0,1,2,\cdots\}$, in which $Xi's$ are i.i.d. standard normal random variables. • Write down $f_{X_n}(x)\ for\ n = 0,1,2,\cdots$. • Write down $f_{X_m X_n}(x_1, x_2)\ for\ m \neq n$.