THAPAR INSTITUTE OF ENGINEERING AND TECHNOLOGY, PATIALA

Department of Electronics and Communication Engineering

UEC310 – Information and Communication Theory

TUTORIAL - 6

Q1	If the random variable X is having exponential distribution i.e. its PDF is given as $f_X(x) = \lambda e^{-\lambda x}\, u(x)$, where $u(x)$ is the unit step function. Show that its moment generating function is $$\phi_X(\omega) = \frac{\lambda}{\lambda - j\omega}$$
Q2	Let X and Y be two jointly continuous random variables with joint PDF $$f_{X,Y}(x,y) = \begin{cases} \frac{3}{2}x^2 + y & 0 < x, y < 0 \\ 0 & otherwise \end{cases}$$ Determine $f_X(x), f_Y(y), E(X), E(Y), E(X^2), E(Y^2), E(XY)$