

Name:

Univ. #:

Q1. (4 points) Let P and Y be two random variables such that $Y|P: \text{Bin}(n, p)$ and $P: U(0, 1)$

1) Find $E(Y)$

2) $\text{Var}(Y)$

Q2. (4 points) If Y_1, \dots, Y_5 are independent random variables each has $\text{Exp}(3)$.

Obtain the pdf of $U = Y_1 + \dots + Y_5$ by using moment generating function method (mgf).

Q3. (12 points) If Y_1 and Y_2 be two random variables with joint pdf $f(y_1, y_2) = e^{-(y_1+y_2)}$, $y_1 > 0, y_2 > 0$.

1) Obtain the pdf of $U = \frac{Y_1}{Y_2}$ by using transformation method.

2) Obtain the pdf of $U = 2Y_1 + Y_2$ by using DF method.