Probability & Statistics – Final Exam

MAT 3701 – Fall 2017

Name:______________________________

Instructor: Alvarado

Calculators, books, and notes are not allowed. You must show your work on each problem to receive credit. No need to simplify.

$$P(B_r|A) = \frac{P(A|B_r)P(B_r)}{P(A)} \quad \text{where} \quad P(A) = \sum_{i=1}^{k} P(A|B_i)P(B_i)$$

$$f(x) = \sum_{n=0}^{\infty} \frac{f^{(n)}(c)}{n!}(x-c)^n \qquad \frac{a}{1-r} = \sum_{n=0}^{\infty} ar^n,\ |r| < 1$$

$$\sum_{i=1}^{n} i = \frac{n(n+1)}{2} \qquad \sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6}$$

$$P\left(|x-\mu| < k\sigma\right) \geq 1 - \frac{1}{k^2},\ \sigma \neq 0 \qquad p(x,\lambda) = \frac{\lambda^x e^{-\lambda}}{x!}$$

$$\mu_r^{'} = E(X^r) \qquad \mu_r = E((X-\mu)^r)$$

$$b(x,n,\theta) = \binom{n}{x}\theta^x(1-\theta)^{n-x} \qquad h(x,n,N,M) = \frac{\binom{M}{x}\binom{N-M}{n-x}}{\binom{N}{n}}$$

$$g(x,\alpha,\beta) = \begin{cases} \dfrac{x^{\alpha-1}e^{-x/\beta}}{\beta^\alpha\Gamma(\alpha)} & \text{if } x > 0 \\ 0 & \text{else} \end{cases} \quad \text{where} \quad \Gamma(\alpha) = \int_0^{\infty} y^{\alpha-1}e^{-y}dy \text{ for } \alpha > 0$$