

# STA 6207 – Fall 2002 – Exam 1

Print Name: \_\_\_\_\_ SSN: \_\_\_\_\_

Note: For a set of constants  $k_1, \dots, k_n$ :

$$Y_1, \dots, Y_n \sim N(\mu_i, \sigma_i^2) \Rightarrow E\left(\sum_{i=1}^n k_i Y_i\right) = \sum_{i=1}^n k_i \mu_i \quad V\left(\sum_{i=1}^n k_i Y_i\right) = \sum_{i=1}^n k_i^2 \sigma_i^2 + 2 \sum_{i=1}^{n-1} \sum_{i'=i+1}^n k_i k_{i'} \text{Cov}(Y_i, Y_{i'})$$

Also Note: For sets of constants  $\{l_i\}$  and  $\{m_j\}$ :

$$\text{Cov}\left(\sum_{i=1}^{n_x} l_i X_i, \sum_{j=1}^{n_y} m_j Y_j\right) = \sum_{i=1}^{n_x} \sum_{j=1}^{n_y} l_i m_j \text{Cov}(X_i, Y_j)$$

Finally Note:

$$\sigma^2 = V(Y) = E[(Y - E(Y))^2] = E(Y^2) - [E(Y)]^2$$