

**Instructions:** This exam is in two parts: Part I is to be completed partly at home using the materials posted on Blackboard for Part I and you will answer questions about that work in class below; Part II is to be completed entirely in class. You may not use cell phones, and you may only access internet resources you are specifically directed to use. You may access your data file for Part I of the exam in Blackboard. You may access the data files posted to Blackboard for the Exam part II. Be sure you are using the data file that matches the exam version you are given.

**Part I: At Home**

This part was completed at home. You can upload the Excel file for Part I to the Part I folder in Blackboard for use during the Exam period. However, this submission will not be graded in this location.

**Part II: In Class**

1. Use the work done at home to answer the Part I questions.
2. Open the file from the in-class portion of the final posted on Blackboard that corresponds to the version of the exam you have. This is Exam B.
3. Answer the questions corresponding to the data file, and any additional calculation in Excel required.
4. When you have finished answering questions on the exam, and all your answers have been recorded on the paper test for grading, upload both the take home Excel file and the in-class Excel file to the same in-class Exam folder in Blackboard for grading. Only those files submitted to the correct folder will be graded.
5. Turn in your paper copy of the exam to your instructor.
6. Enjoy your break!





e. What is the probability the person has opinion 4 given that they are male? (6 points)

f. What is the probability that the person either is male or has opinion 4? (6 points)

g. Are the variables Gender and Opinion independent? Why or why not? Show math to support your conclusion. (10 points)

4. Use the bar graph to describe something about how the opinions of men and women differ in this survey. (6 points)

5. Using your histogram of age, describe the shape of the distribution. (5 points)



11. What is the mean and standard deviation of the probability distribution provided? (8 points)

12. Were you able to find a  $p$  value that creates a binomial distribution identical to this data? Report the  $p$  value here. (6 points)

Calculations in Excel: (1) 40 points, (2) 28 points, (3) 15 points.

Part II:

1. Suppose that the annual return on XYZ stock follows a normal distribution with mean 14% and standard deviation 2.1%.
  - a. What is the probability that XYZ's value will decrease during the following year? (i.e. percent return will be less than 0%) (8 points)
  - b. What is the probability that XYZ's return will be greater than 15%? (8 points)
  - c. For what percent return value does XYZ stock have only a 5% chance of exceeding that value? (8 points)

d. What is the probability of XYZ's rate of return will fall between 10% and 18%? (8 points)

2. Suppose that Comdell Computer receives its hard drives from Diskco. On average, 3% of all hard disk drives received by Comdell are defective.

a. Comdell has adopted the following policy: It samples 50 hard drives in each shipment and accepts the shipment if all hard drives in the shipment are not defective. What fraction of shipments will Comdell accept? (8 points)

b. Suppose instead that the shipment is accepted if at most one hard drive in the sample is defective. What fraction of shipment will Comdell accept? (8 points)

c. What is the probability that a sample size of 50 will contain at least 10 defectives? (8 points)

Upload your completed Excel files to the Final Exam (to be graded) submission box in Blackboard, and submit your completed paper exam to your instructor. You may not modify anything once the exam is submitted.

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$P(A|B) = \frac{P(A \text{ and } B)}{P(B)}$$

$$\mu = E(X) = \sum x_i p(x_i)$$

$$\sigma^2 = \text{Var}(X) = \sum (x_i - \mu)^2 p(x_i)$$

$$\mu_{\text{binomial}} = np$$

$$\sigma_{\text{binomial}}^2 = np(1 - p)$$