

K. J. SOMAIYA INSTITUTE OF MANAGEMENT STUDIES AND RESEARCH,
Vidyavihar, Mumbai- 400077

Program: PGDM- IB, Trim-I
Subject: Business Statistics

(End Term Exam)

Maximum Marks: 50
2018
Duration: 3 hrs.

Date: 27th Oct.,

Instructions

- 1. This exam will be conducted in the computer lab. All answers are to be written in the Word file. Use Excel where required.**
- 2. All questions are compulsory.**

QUESTION 1

(10)

- 1) When a customer places an order with Rudy's on line office supplies, a computerized accounting information system (AIS) automatically checks to see if the customer has exceeded his or her credit limit. Past records indicate that the probability of customers exceeding their credit limit is 0.05. Suppose that, on a given day, 20 customers place orders. Assume that the number of customers that the AIS detect as having exceeded their credit limit is distributed as binomial random variable.
 - a. What are the mean and standard deviation of the number of customers exceeding their credit limits?
 - b. What is the probability that zero customers will exceed their limit?
 - c. What is the probability that fewer than eight customers will exceed their limits?
 - d. What is the probability that twelve or more customers will exceed their limits?
 - e. What you conclude from "a to e" parts?
- 2) J. D. Power & Associates calculates and publishes various statistics concerning car quality. The Initial Quality score measures the number of problems per new car sold. For 2003 model cars, the Lexus was the top brand with 1.63 problems per car. Korea's Kia came in last with 5.09 problems per car. Let the random variable X be equal to the number of problems with a newly purchased Lexus. If you purchased a 2003 Lexus, what is the probability that the new car will have
 - a. Zero problems.
 - b. Two or fewer problems.

QUESTION 2

(10)

- 1) A statistical analysis of 1,000 long distance telephone calls made from the headquarters of the Bricks and Clicks Computer Corporation indicates that the length of these calls is normally distributed with mean is 240 seconds and standard deviation 40 seconds.
 - a. What is the probability that a call lasted less than 180 seconds?
 - b. What is the probability that a particular call lasted between 180 and 300 seconds?
 - c. What is the probability that a call lasted more than 110 seconds?
 - d. What is the length of a particular call if only 1% of all calls are shorter?

- 2) A company that manufactures chocolates bars is particularly concerned that the mean weights of the chocolate bar not exceed 6.03 ounces. Past experience allows you to assume that the standard deviation is 0.02 ounce. A sample of 50 chocolate bars is selected and the sample mean is 6.034 ounces. Use 0.01 level of significance; is there evidence that the population mean weight of the chocolate bars is greater than 6.03 ounces?

QUESTION 3

(10)

- 1) A manufacturing company produces electric insulators. If the insulators break when in use, you are likely to have a short circuit. To test the strength of the insulators, you carry out destructive testing to determine how much force is required to break the insulators. You measure force by observing how many pounds are applied to the insulators before it breaks. Table below listed thirty values from this experiment. Construct a 95% confidence interval estimate for the population mean force required to break the insulators.

1870	1728	1656	1610	1634	1784	1522	1696	1592	1662
1866	1764	1734	1662	1734	1774	1550	1756	1762	1866
1820	1744	1788	1688	1810	1752	1680	1810	1652	1736

$$(t_{(\alpha = .025, df = 29)} = 2.0452)$$

- 2) The telephone company wants to estimate the proportion of households that would purchase an additional telephone line if it were made available at a substantially reduced installation cost. A random sample of 500 households is selected. The results indicate that 135 of the households would purchase the additional telephone line at a reduced installation cost. Construct a 99% confidence interval estimate of the population

proportion of households that would purchase the additional telephone line.

QUESTION 4

(10)

Human resources managers responsible for a variety of tasks within organizations. HR management ages are involved with recruiting new workers, determining which applicants are most suitable to hire, and in various aspects of monitoring the workforce, including absenteeism and worker turnover. For many firms, worker turnover is a costly problem. First, there is the cost of recruiting and attracting qualified workers. The firm must advertise vacant positions and make certain that applicants are judged properly. Second, the cost of training hires can be high, particularly in technical areas. Third, new employees are often not as productive and efficient as experienced employees. Consequently, it is in the interests of the firm to attract and keep the best workers. Any information that the personnel manager can obtain is likely to be useful.

The human resources manager of a telemarketing firm is concerned about the rapid turnover of the firm's telemarketers do not work very long before quitting. There may be a number of reasons, including relatively low pay, person unsuitability of work, and a low probability of advancement. Because of the high cost of hiring and training new workers, the manager decided to examine the factors that influence workers to quit. He reviewed that work history of a random sample of workers have quit in the last year and recorded the number of weeks on the job before quitting and the age of each worker when originally hired.

Questions:

- a. Use correlation and regression analysis to describe how the work period and age are related.
- b. Briefly discuss what the coefficients tell you.

QUESTION 5

(10)

Suppose you want to invest \$ 200,000 in the stock market. You are interested in developing a stock portfolio made up of stocks on the New York Stock Exchange. The stocks are AT&T, Cigna, Disney, and Ford. Find the expected value and standard deviation of the returns for the following portfolios and identify the best portfolio.

1. Equal in each stock.
2. AT&T : 60,000, Cigna: 40,000, Disney : 70,000, and Ford : 30,000