**BNAD/ECON/MGMT 276. STATISTICAL INFERENCE IN MANAGEMENT**

**Presession.Summer2016.**

**FINAL REVIEW**

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**Final Exam: 50—80 points, < 60 questions, multiple-choice questions, matching question, writing questions (50%—70%). Time allowed: 120 minutes (2 hours).**

**Content covers: (please see more detail and restriction by announcements on the website)**

Part 1. Descriptive Statistics

Review questions in Quiz 1, Test 1, and lecture note 1, 2 exercises.

Part 2. Probability Theory

Review questions in Test 1, and lecture note 3, 4 exercises

Part 3. Discrete Probability Distribution

Review questions in Quiz 2, Test 2, and lecture note 5 exercises

Part 4. Continuous Probability Distribution

Review questions in Quiz 2, Test 2, and lecture note 6 exercises

Part 5. Statistical Inferences

Review questions in lecture notes 7, 8, 9 exercises and below.

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| 1. Ten percent of the items produced by a machine are defective. A random sample of 100 items is selected and checked for defects.   |  |  | | --- | --- | | a. | What is the sampling distribution of the sample proportion? | | b. | What is the probability that the sample will contain more than 2.5% defective units? | | c. | What is the probability that the sample will contain more than 13% defective units? | |

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| 2. A simple random sample of 8 employees of a corporation provided the following information.   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Employee | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | Age | 25 | 32 | 26 | 40 | 50 | 54 | 22 | 23 | | Gender | M | M | M | M | F | M | M | F |  |  |  | | --- | --- | | a. | Determine the point estimate for the average age of all employees. | | b. | What is the point estimate for the standard deviation of the population? | | c. | Determine a point estimate for the proportion of all employees who are female. | |
| 3. The life expectancy in the United States is 75 with a standard deviation of 7 years. A random sample of 49 individuals is selected.   |  |  | | --- | --- | | a. | What is the probability that the sample mean will be larger than 77 years? | | b. | What is the probability that the sample mean will be less than 72.7 years? | | c. | What is the probability that the sample mean will be between 73.5 and 76 years? | | d. | What is the probability that the sample mean will be between 72 and 74 years? | | e. | What is the probability that the sample mean will be larger than 73.46 years? | |

1. People end up tossing 12% of what they buy at the grocery store (Reader’s Digest, March 2009). Assume this is the true population proportion and that you plan to take a sample survey of 540 grocery shoppers to further investigate their behavior.
2. Show the sampling distribution of the proportion of groceries, thrown out by your sample respondents.
3. What is the approximate probability that your survey will provide a sample proportion between 9% and 15%?
4. What is the probability that your survey will provide a sample proportion within of the population proportion?
5. A sample survey of 54 discount brokers showed that the mean price charged for a trade of 100 shares at $50 per share was $33.77 (AAII Journal, February 2006). The survey is conducted annually. A manager believes that the mean price of shares is going to increase to $60 next year.With the historical data available, assume a known population standard deviation is $15.
6. Develop a 95% confidence interval estimate of the mean price charged by discount brokers for a trade of 100 shares at $50 per share

Now you want to test the manager’s conjecture at the significant level of 5%

1. State the null and alternative hypotheses to test the manager’s conjecture.
2. Calculate the test statistic.
3. Test the hypothesis using the critical value approach.
4. Test the hypothesis using the p-value approach.
5. A survey conducted by the American Automobile Association showed that a family of four spends an average of $215.60 per day while on vacation. Suppose a sample of 64 families of four vacationing at Niagara Falls resulted in a sample mean of $252.45 per day and a sample standard deviation of $74.50.
6. State the null and alternative hypotheses to test the the conclusion of the survey.
7. Calculate the test statistic.
8. Use the critical value approach to test the hypotheses at the 5% level of significance.
9. Use the critical value approach to test the hypotheses at the 1% significant level.