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**Fənnin adı: Statistika**

**Qrupun nömrəsi: Dünya İqtisadiyyatı, qrup 1007**

**Birinci kolleqvium üçün suallar:**

**Question 1.**

Problem solving (frequency distribution)

|  |  |
| --- | --- |
| a. Complete frequency distribution table. |  |
| b. Draw a histogram, Pareto diagram and an Ogive.  |  |
| c. Explain what is Frequency Distributions and why we use them? |  |

**Question 2.**

Problem solving (illustration of data)

a. Construct a frequency distribution.

b. Construct a histogram and interpret your result.

c. Construct an ogive and interpret your result.

d. Construct a stem-and-leaf display and interpret your result.

**Question 3.**

Problem solving (descriptive statistics)

a. Compute average sales using measures of central tendency for both companies.

Which measures of central tendency best describes the data? why?

b. Find the coefficient of variation for both companies and interpret these statistics and make decision which company is more risky based on your outputs.

c. Find the five-number summary for the company

**Question** **4.**

Problem solving (analytical explanation of frequency distribution)

a. Construct a relative cumulative frequency distribution.

b. What percent of observation were under given frequency?

c. What percent of observations were Y or higher?

**Question** **5**.

Consider the following frequency distribution:

a. Construct a relative frequency distribution.

b. Construct a cumulative frequency distribution.

c. Construct a cumulative relative frequency distribution and interpret your result.

**Question** **6**.

 a. Construct the histogram and interpret your result.

b. Determine the relative frequencies and interpret your result.

c. Determine the cumulative frequencies.

d. Determine and interpret the relative cumulative frequencies.

**Question** **7.**

Problem solving on Descriptive Statistics

a. Compute mean, median, and mode for both companies.

b. Explain the differences, what do they mean.

c. Which measure of central tendency best describes the data? and why?

d. Find the standard deviation and coefficient of variation for both and interpret the result economically.

e. Compare and comment on standard deviation and coefficient of variation.

g. Interpret the results economically. (What does this relation economically mean)

**Question** **8**.

**This question refers to question (7).**

a. Find all three quartiles for both.

b. Find Interquartile range for both.

c. Find the five-number summary for both .

**Question** **9**.

a. Calculate mean, variance and standard deviation for the both variables.

b. Compute covariance and correlation coefficient.

c. Comment on strength and direction of relationship between the two variables.

d. Interpret the results economically. (What does this relation economically mean).

e. Comment on strength and direction of relationship between the two variables.

**Question** **10**.

Chebyshev’s theorem (problem solving).

**Question** **11**.

a. Compute the covariance.

b. Compute the correlation coefficient.

**Question** **12**.

a. Calculate the arithmetic mean of the *xi* values without weights.

b. Calculate the weighted mean of the *xi* values.

**Question** **13**.

Construct a stem-and-leaf display for the given problem

**Question** **14**.

Problem solving (Pareto Diagram).

a. Construct a Pareto diagram of these defects in data

entry and demonstrate your understanding on Pareto diagram.

b. What recommendations would you suggest to the

county appraiser?

**Question** **15.**

a. Determine interval width and boundaries (number of classes is 5).

b. Construct a frequency distribution.

c. Draw a histogram.

d. Draw an Ogive.

e. Draw a stem-and-leaf display.

**Question** 16.

a. Construct a relative frequency distribution

b. Construct a cumulative frequency distribution.

c. Construct a cumulative relative frequency distribution.

d. Interpret the relative cumulative frequencies.

**Question** 17.

Problem solving (Pareto diagram).

**Question** 18.

Describe the following random sample with a stem-and-leaf display **.**

**Question** 19.

Describe the central tendency of the data.

**Question 20.**

Find the mean, median, and mode for a random sample

**Question 21.**

Demonstrate your understanding on Percentiles and Quartiles.

**Question 22.**

Find the five-number summary. İnterpret your results based on your findings.

**Question 23.**

a. Compute the mean number of weekly complaints.

b. Calculate the median number of weekly complaints.

c. Find the mode.

**Question 23.**

a. Find the mean, median and mode for this store.

b. Find the five-number summary. İnterpret your results based on your findings

**Question 24.**

a. Find the z-score for a student who scored X.

b. A student is told that his z-score on this test is Z. What was his actual SAT

math score?

c. İnterpret your results based on your findings

**Question 25.**

Compute the standard deviation and coefficient of variation of the following sample data. Compare and interpret your findings:

**İkinci kolleqvium üçün suallar:**

**Question 1**.

a. Calculate mean, variance and standard deviation for the both variables.

b. Compute covariance and correlation coefficient.

c. Comment on strength and direction of relationship between the two variables.

d. Interpret the results economically. (What does this relation economically mean).

**Question 2**.

 Problem solving (Probability rules)

**Question 3**.

Problem solving (introduction to Probability).

**Question 4.**

Problem solving

a. Compute the covariance.

b. Compute the correlation coefficient.

**Question 5.**

Problem solving

a. Find the probability of A and B.

b. Find the probability of the Complement of A and B.

c. Find the probability of union and intersaction of A and B.

d. Are the events mutually exlusive? Calculate and explain

e. Are the events A and B collectively exhaustive? Calculate and explain

**Question 6.**

 Problem solving

a. Find the z-score for a student who scored X.

b. A student is told that his z-score on this test is -Z. What was his actual SAT

math score?

**Question 6.**

Problem solving (conditional probability)

**Question 7.**

Problem solving (statistically independent )

**Question 8.**

Problem solving (Bayes Theorem)

1. Using Bayes theorem and probability rules (where needed) find the probability of P (A\B).
2. Show how to get Bayes Formula from conditional probability.

**Question 9.**

Problem solving (Heterogeometric distribution)

**Question 10.**

Problem solving (Probability of different events)

a. Find the probability of event *A*.

b. Find the probability of event *B*.

c. Are events A and B mutually exclusive?

d. Are events A and B collectively exhaustive?

e. Find the probability of the intersection of events *A* and *B*.

**Question 11.**

Demonstrate your understanding on Percentiles and Quartiles.

**Question 12.**

Problem solving (Probability rules)

**Question 13.**

Problem solving (Portfolio problem)

**Question 14.**

Summary of Properties for Linear Functions of Random Variables

**Question 15.**

Problem solving (discrete probability distribution)

**Question 16.**

Problem solving Find the mean and variance of the portfolio with one dependent variable.

**Question 17.**

Problem solving.

a. Graph the probability distribution function.

b. Calculate and graph the cumulative probability

distribution.

c. Find the mean of the number of returns of an

automobile for corrections for defects during the

warranty period.

**Question 18.**

Problem solving.

Find mean and variance of the number of returns of a given exercise

**Question 19.**

Problem solving.

Find the mean number of given discrete probability distribution.

**Question 20.**

Problem solving.

Find the expected value and variance for this probability distribution.

**Question 21.**

Problem solving Find the mean and variance of the portfolio with one dependent variable.

**Question 22.**

Problem solving.Distribution probability

**Question 23.**

Demonstrate your understanding on bernulli and binomial probability distributions( in which situation we use them and what is difference between them).

**Question 24.**

Problem solving (Chebishev theorem).

**Üçüncü kolleqvium üçün 25 sual:**

**Question1.**

Find the reliability factor, *z*a/2, to estimate the mean,µ, of a normally distributed population with known population variance for the following. Explain your results.

**Question** 2.

Find the reliability factor, *z* α /2, to estimate the mean, µ, of a normally distributed population with known population variance

**Question** 3.

Assume a normal distribution with known population variance. Calculate the margin of error to estimate the population mean, m.

**Question** 4.

Assume a normal distribution with known population variance. Calculate the width to estimate the population mean, m.

**Question** 5.

Assume a normal distribution with known population variance. Calculate the LCL and UCL for each of the following. Explain your results.

**Question** 6.

 Problem solving(Confidence interval).

a. Calculate the standard error of the mean.

b. Find the margin of error of a 90% confidence interval estimate for the population mean volume.

c. Calculate the LCL, UCL and the width for a 98% confidence interval for the population mean volume.

**Question** 7.

 Problem solving.

a. Find a 95% confidence interval for the population mean.

b. Based on these sample results, a statistician computes for the population mean a confidence interval

extending from 2.81 to 2.99. Find the confidence level associated with this interval.

**Question 8.**

Calculate the margin of error to estimate the population mean for each of the following (variance is unknown).

**Question** 9.

Find the LCL and UCL for each of the following.

**Question** 10.

a. Calculate the margin of error for a 95% confidence interval estimate of the mean lifetime of this type of tire if driven under normal driving conditions.

b. Find the UCL and the LCL of a 90% confidence interval estimate of the mean lifetime of this type of tire if driven under normal driving conditions.

**Question11**.

Calculate the width for each of the following.

**Question** 12.

Find the margin of error to estimate the population proportion for each of the following.

**Question 13**.

Calculate the confidence interval to estimate the population proportion for each of the following.

**Question** 14.

Find a 90% confidence interval from the given example for the population mean, assuming that the population distribution is normal. Explain your results.

**Question** 15.

 Demonstrate your understanding on Confidence interval.

**Question 16**.

Demonstrate your understanding on interpretation of the Probability Value, or p-Value.

**Question 17**.

 Problem solving (confidence interval).

**Question 18**.

Demonstrate your understanding on Uniform distribution

**Question 19.**

 Demonstrate your understanding on Unbiased Estimator, Most Efficient Estimator and Relative Efficiency

**Question 20.**

Problem solving (uniform distribution)

1. Graph the probability density function.
2. Find and graph the cumulative distribution function.

c. Find the probability for the given values.

**Question 21**.

 Problem solving (Normal distribution)

**Question 22**.

Problem solving ( Find the mean and variance of the discrete distribution).

**Question23.**

 Problem solving ( Find the mean and variance of the portfolio).

**Question 24**.

Let the random variable *X* follow a normal distribution with m and σ2

a. Find the probability that *X* is greater than the given number.

b. Find the probability that *X* is greater than the given number and less than the given number.

c. Find the probability that *X* is less than the given number.

d. The probability is P that *X* is greater than what number?

e. The probability is P that *X* is in the symmetric interval about the mean between which two

numbers?

**Question 25.**

Let the random variable *Z* follow a standard normal distribution.

a. The probability is P that *Z* is less than what number?

b. The probability is P that *Z* is less than what number?

c. The probability is P that *Z* is greater than what number?

d. The probability is P that *Z* is greater than what number?