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| **AZƏRBAYCAN DÖVLƏT İQTİSAD UNİVERSİTETİ** |
| **BEYNƏLXALQ İQTİSADİYYAT MƏKTƏBİ** |
| **BEYNƏLXALQ İQTİSADİYYAT (İNGİLİS DİLLİ) KAFEDRASI**  Müəllimin adı: İbrahim İbrahimov  Fənnin adı: Statistika  Qrupun nömrəsi: 1006  **İMTAHAN SUALLARI** |

1. Refering to the following classes and frequency answer the questions below.

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| 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? |  |

2. Consider the following 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.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 3. Assume that sales statistics (in thousand USD) of two companies are given below: | | | | | |
|  |  |  |  | |  |
| a. Compute average sales using measures of central tendency for both companies.  Which measures of central tendency best describes the data? why? | | | | | | | |
| b. For simplicity assume that standard deviation for company X is | | | | | A | | |
| 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 X | | | | | | | |

4. The following table shows the ages of competitors in a charity tennis event in Rome:

a. Construct a relative cumulative frequency distribution.

b. What percent of competitors were under the age of X?

c. What percent of competitors were Y or older?

5. Consider the following frequency distribution: Class and Frequencies are given.

a. Construct a relative frequency distribution.

b. Construct a cumulative frequency distribution.

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

6. A sample of 20 financial analysts was asked to provide forecasts of earnings per share of a corporation for next year. The results are summarized in the following table:

Forecast ($ per share) : Number of Analysts:

classes frequencies

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.

7. Any exercise case of two companies

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)

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 .

9. The following data give X, the price charged per piece of table, and Y, the quantity sold (in thousands). Values for Price per Piece (X) and Thousands of Pieces Sold (Y) will be provided.

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.

10. A random sample of data has a mean of A and a variance of B.

a. Use Chebyshev’s theorem to determine the percent of observations between two numbers.

b. If the data are mounded, use the empirical rule to find the approximate percent of observations between these two numbers.

11. Following is a random sample of seven (x, y) pairs of data points:

(x1,y1), (x2,y2), (x3,y3), (x4,y4), (x5,y5)

a. Compute the covariance.

b. Compute the correlation coefficient.

12. Consider the following sample of five values and corresponding weights:

*xi wi*

. .

. .

. .

. .

. .

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

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

13. Construct a stem-and-leaf display for the hours that 20 students spent studying for a marketing test.

x1, x2, x3,…, x20

14. A team of undergraduate business students was asked to recommend improvement to the data entry process at the county appraiser’s office. The team identified several types of errors, such as posting an incorrect name or entering an incorrect parcel number. The deed abstractors were asked to keep a record of the errors in data entry that were sent to them. The following table is a frequency distribution of errors:

Defects Total

Defect1 value1

Defect2

……… value2

Defect n value n

1. 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?

1. Consider the following data:

a1, a2, a3, …,an

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.

16. Consider the following frequency distribution:

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.

1. A company has determined that there are seven possible defects for one of its product lines. Construct a Pareto diagram for the following defect frequencies:

Defect Code Frequency

A value

B value

C value

D value

1. Describe the following random sample of 10 final exam grades for an introductory

accounting class with a stem-and-leaf display.

Value1 Value2 Value3 .. .. .. Value n

1. The demand for bottled water increases during the hurricane season in Florida. The

number of 1-gallon bottles of water sold for a random sample of n = number hours in one

store during hurricane season is:

Value1 Value2 Value3 .. .. .. Value n

Describe the central tendency of the data.

1. Find the mean, median, and mode for a random sample of eight U.S. corporations with

the following percentage changes in earnings per share in the current year compared

with the previous year:

Value1 Value2 Value3 .. .. .. Value n

1. Demonstrate your understanding on Percentiles and Quartiles.

22. The demand for bottled water increases during the hurricane season in Florida. The

number of 1-gallon bottles of water sold for a random sample of (*n* = any number) hours in one

store during hurricane season is:

Value1 Value2 Value3 .. .. .. Value n

Find the five-number summary.

1. A department-store manager is interested in the number of complaints received by the customer-service

department about the quality of electrical products sold by the store. Records over a 5-week period show

the following number of complaints for each week:

Value1 Value2 Value3 .. .. .. Value n

a. Compute the mean number of weekly complaints.

b. Calculate the median number of weekly complaints.

c. Find the mode.

1. During the last t years Consolidated Oil Company expanded its gasoline stations into convenience food stores (CFSs) in an attempt to increase total sales revenue. The daily sales (in hundreds of dollars) from a random sample of X weekdays from one of its stores are:

Value1 Value2 Value3 .. .. .. Value n

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

b. Find the five-number summary.

1. Consider a very large number of students taking a college entrance exam such as the

SAT. And suppose the mean score on the mathematics section of the SAT is M with a

standard deviation of S.

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

b. A student is told that his z-score on this test is Z1. What was his actual SAT

math score?

1. Compute the standard deviation and coefficient of variation of the following sample data. Compare and interpret your findings.
2. Refering to given events solve exercises on intersection, union and collectively exhaustiveness. What is A intersection B? What is the union of A and B? Is the union of A and B collectively exhaustive?
3. Problem solving regarding Probability concepts. Describe the event that is the complement of event A. Describe the event that is the intersection of events A and B. Describe the event that is the union of events A and B.
4. Your are given any two events. Prove if the equalities are correct using probability rules. Are events A and B mutually exclusive?. Are events A and B collectively exhaustive?. Show that (A ᴖ B) ᴗ (Ā ᴖ B) = B.
5. Problem solving on Linear functions. Find the mean and variance for independent variable of *X*. Find the mean, variance, and standard deviation for dependent variable of Y. Compare main descriptive statistics and interpret your findings.
6. Question on conditional probability (exercise).
7. Question on probability distribution (Problem solving).
8. Problem solving on Product Selection (Addition Rule).
9. Question on conditional probability (exercise).
10. Problem solving (statistically independent events).
11. Question on probability (exercise on Bayes theorem). Derive conditional probability and find Bayes formula.
12. Heteregoemetric distribution exercise.
13. Find probability of two diferent event and prove equalities using probability rules (exercise).
14. Problem solving on additional rule
15. Find mean and standard deviation of investment portfolio and interpret your findings
16. Summary of Properties for Linear Functions of Random Variables.
17. Calculate probabilities using probability distribution.
18. Consider the probability distribution function. Graph the probability distribution function.
19. Consider the probability distribution function. Calculate and graph the cumulative probability distribution.
20. Consider the probability distribution function. Find the mean and variance of the random variable X.
21. Illustrate Probability Distribution Function and find expected value and variance of given probability distribution.
22. Find expected value and variance of given probability distribution.
23. Find the mean and variance of any financial issue which is linear function of another variable.
24. Calculate mean and the variance of the given distribution (Bernulli distribution/binomial distribution).
25. Demonstrate your understanding on bernulli and binomial probability distributions.
26. Summary Results for Linear Sums and Differences of Random Variables.
27. Demonstrate your understanding on the Poisson Distribution Function, Mean, and Variance.
28. Demonstrate your understanding on Uniform Distribution Function, Mean, and Variance
29. Demonstrate your understanding on Normal and standard Normal Distribution, Mean, and Variance
30. Exercise on discrete probability distribution case of portfolio analysis.
31. Assume nonnormality and find a point estimate of the population mean that is unbiased and efficient. Use an unbiased estimation procedure to find a point estimate of the variance of the sample. Use an unbiased estimator to estimate the proportion of homes in this suburb selling for less than given value.
32. Exercise.Derivation and calculation on unbiased estimator, most efficient estimator and relative efficiency.
33. Based on given assumption find sample measn is less/outside the range (range and upper or lower limit are given.
34. Exercise on Confidence level and Z-table.
35. Find the reliability factor, z α /2, to estimate the mean, µ, of a normally distributed population with known population variance for the following.
36. Assume a normal distribution with known population variance. Calculate the margin of error to estimate the population mean, m, for the following.
37. Assume a normal distribution with known population variance. Calculate the width to estimate the population mean, m, for the following.
38. Assume a normal distribution with known population variance. Calculate the LCL and UCL for each of the following.
39. Calculate the standard error of the mean. Find the margin of error of a (1-a)% confidence interval estimate for the population mean volume. Calculate the LCL, UCL and the width for a (1-a) % confidence interval for the population mean volume.
40. Observation number? Mean and standard deviation are given. First of all find confidence interval of (1-a) for the population mean. Based on these sample results, a statistician computes for the population mean a confidence interval extending from A to B. Find the confidence level associated with this interval.
41. Find the standard error to estimate the population mean for each of the following.
42. Calculate the margin of error to estimate the population mean for each of the following (variance is unknown).
43. Find the LCL and UCL for each of the following.
44. Exercise on ME,UCL,LCL referring to given assumptions and given statistics.
45. Find the margin of error and and widt to estimate the population proportion for each of the given statistics.
46. Find a 90% confidence interval for the population mean, assuming that the population distribution is normal(years, sample mean, st.deviation are given).
47. Demonstrate your understanding on Unbiased Estimator, Most Efficient Estimator and Relative Efficiency
48. Demonstrate your understanding on interpretation of the Probability Value, or p-Value.
49. Demonstrate Confidence Interval Estimation for the Mean of a Population That Is Normally Distributed: Population Variance Known.
50. Example and interpretation of confidence interval both practically based on your findings and theoretically using lecture notes.
51. Demonstrate your understanding on standard normal distribution and Z-value, why we need to convert normal distribution to standard normal distribution and give example.