QUANTITATIVE APPLICATIONS IN MANAGEMENT

Assignment

1. Define statistics and its various types?
2. What are the advantages of statistics?
3. Define and illustrate limitations of statistics?
4. How many types of data classification are there? Illustrate with examples.
5. What are the sources of collection of data? Give a brief description of each type?
6. Which data collection is preferable, primary or secondary and why?
7. Frame a question with 200 data values:
   1. Make a discrete series
   2. Form a continuous inclusive series with class interval of 10
   3. Form an exclusive series with class size as 8
8. Draw an appropriate diagram and charts for all the three types of series as given in question 7?
9. Plot cumulative frequency and histogram of inclusive series?
10. Differentiate between different types of graphs and diagrams and illustrate with suitable examples?

**Following questions are based on the 200 values taken in question no 7**

1. ) Find arithmetic mean, geometric mean, and harmonic mean in case of raw series, discrete series and continuous series?
2. ) In case of raw series, discrete series, continuous series
   1. Median
   2. Quartile
   3. Decile (D4, D7)
   4. Percentile (P7, P26, P 72)
   5. Mode
3. ). Find the range, coefficient of range, standard deviation, coefficient of standard deviation, mean deviation, coefficient of mean deviation, quartile deviation and coefficient of quartile deviation of raw series, discrete series and continuous series?
4. ) Statistical methods are the most dangerous tools in the hands of an inexpert. Examine this statement. How are statistics helpful in business and industry? Explain.
5. ) What role does Business Statistics play in the management of a business enterprise? Examine its scope and limitations.
6. ) Statistics are like clay of which you can make a God or Devil, as you please. Explain.
7. ) There are three known lies: lies, dam-lies and statistics. Comment on this statement and point out the limitations of statistics.
8. ) Statistics in the science of estimates and probabilities. Explain the statement and discuss the role of statistics in the management of business enterprises.
9. ). The orange county transportation Commission is concerned about the speed motorists are driving on a section of the main highway .Here are the speed of 45 motorists.

|  |  |
| --- | --- |
| 15 | 32 45 46 42 39 68 47 18 |
| 31 | 48 49 56 52 39 48 69 61 |
| 44 | 42 38 52 55 58 62 58 48 |
| 56 | 58 48 47 52 37 64 29 55 |
| 38 | 29 62 49 69 18 61 55 49 |

Use these data to construct relative frequency distribution using 5 equals intervals and 11 equal intervals. The U.S department of transportation reports that, nationally, no more than 10 percent of the motorists exceed 55 mph.

1. Do orange country motorists follow the U.S DOT’s report about national driving patterns?
2. Which distribution did you use to answer part (A)?
3. The U.S DOT has determined that the fastest speed for this highway is more than 36 but less than 59 mph. What proportion of the motorists drive within this range? which distribution helped you answer this question?

Q20. The Bureau of Labor Statistics has sampled 30 communities nationwide and compiled prices in each community at the beginning and the end of August to find out approximately low the consumer price index (CPI) has changed during August. The percentage changes in the prices for the 30 communities are as follows.

0.7 , 0.4, -0.3, 0.2, -0.1, 0.1, 0.3, 0.7 0, -0.4, 0.1, 0.5, 0.2, 0.3, 1.0, -0.3, 0.0, 0.2,

0.5, 0.1, -0.5, -0.3, 0.1, 0.5, 0.4, 0.0, 0.2, 0.3, 0.5, 0.4, 0.3

* 1. Arrange the data in an array from lowest to highest.
  2. Using the following four equal sized classes, create a frequency distribution: -0.5 to - 0.2, -0.1 to 0.2, 0.3 to 0.6, and 0.7 to 1.0.
  3. How many communities had prices that either did not change or that increased less than 1.0 percent?
  4. Are these data discrete or continuous?

Q 21. Central Carolina Hospital has the following data representing weight in pounds at birth of 200 premature babies.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Class | Frequency |  | Class | Frequency |
| 0.5 – 0.9 | 10 |  | 2.5– 2.9 | 29 |
| 1.0 – 1.4 | 19 |  | 3.0- 3.4 | 34 |
| 1.5 – 1.9 | 24 |  | 3.5– 3.9 | 40 |
| 2.0 – 2.4 | 27 |  | 4.0- 4.4 | 17 |

Construct an ogive that will help you answer these questions:

1. What was the approximate middle value in the original data set?
2. If the premature babies under 3.0 pounds are normally kept in an incubator for the several days as a precaution, about what percentage of Central’s premature babies will need an incubator?

Q-22. Springfield is a college town with the usual parking problems. The city allows people who have received tickets for illegally parked cars to come in and make their case to an administrator officer and have the ticket voided. The town’s administrative officer collected the following frequency distribution for the time spent on each appeal:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Minutes spent on appeal | Frequency |  | Minutes spent on appeal | Frequey |
| Less than 2 | 30 |  | 8 – 9 | 70 |
| 2-3 | 40 |  | 10-11 | 50 |
| 4-5 | 40 |  | 12 -13 | 50 |
| 6-7 | 90 |  | 14 -15 | 30 |
|  |  |  |  | 400 |

(a)Construct a “less than” cumulative frequency distribution. (b)Construct an ogive based on part (A).

(c) the town administrator will consider streamlining the paperwork for the appeal process if more than 50 percent of appeals take longer than 4 minutes. What is the percentage taking more than 4 minutes? What is the approximate time for the 200th (midpoint) appeal?

Q-23. National Tire Company holds reserve funds in the short-term marketable securities.

The ending daily balance (in millions) of the marketable securities account for 2 weeks is shown below:

Week 1 $ 1.973 $1.970 $ 1.972 $1.975 $1.976

Week 2 $ 1.969 $1.892 $ 1.893 $ 1.887$ 1.895

What was the average (mean) amount invested in marketable securities during? (a)The first week?

1. The second week?
2. The 2-week period?
3. An average balance over the 2 weeks of more than $1.970 million would qualify National for higher interest rates. Does it qualify?
4. If the answer to part (c) is less than $1.970 million, by how much would the last day’s invested amount have to rise to qualify the company for the higher interest rates?
5. If the answer to part (c) is more than $1.970 million, how much could the company treasurer withdraw from the reserve funds on the last day and still qualify for the higher interest rates?
   1. Meridian Trucking maintains mileage records on all its rolling equipment. Here are weekly mileage records for its trucks.

810 450 756 789 210 657 589 488 876 689

1,450 560 469 890 987 559 788 943 447 775

(a) Calculate the median miles a truck travelled? (b)Calculate the mean for the 20 trucks?

(c) compare parts (a) and (b) and explain which one is better measure of the central tendency of the data?

* 1. Allison Barrett does statistical analyses for an automobile racing team. Here are the fuel consumption figures in miles per gallon for the team’s cars in recent races:

4.77, 6.11, 6.11, 5.05, 5.99, 4.91, 5.27, 6.01, 5.75, 4.89, 6.05, 5.22, 6.02, 5.24, 6.11, 5.02

* + 1. Calculate the median fuel consumption.
    2. Calculate the mean fuel consumption.
    3. Group the data into five equally sized classes. what is the fuel consumption value of the modal class?
    4. Which of the three measures of the central tendency is best for Allison to use when she orders fuel? Explain.