Name: Haris Khan

ID: 13825

Dept: MSMC

Sem: 6th

Subject: Statistic

Teacher: Sir Raza

IQRA NATIONAL UNIVERSITY Peshawar

SPRING-2020

Program: MSMC

Course Title: BASIC STATISTICS

Dated: 16th April,2020

Due Date : 22nd April, 2020

Instructor : Raza Ahmed Khan **Total marks: 30**

Important Instructions:

- **Assignment should be submitted within 6 - days.**
- **Submitted Document's format should be in word, pdf or in jpg.**
- **No Assignment will be accepted after due date mentioned above.**
- **Note: Attempt All Questions**

Question No: 01

Fill the following statements with appropriate words and options:

(1- Each)

1. Statistics is the word which use to measure_____DATA____.
2. Figures belongs with Photographic data.
3. Attributive study of the data belongs with Errors within.
4. Measuring system is the process which separate data in homogeneous groups.
5. The graph which construct on behalf of continuous group of data is called as

Line Graph.

6. The Grading score of the students belongs with ordinal measurement

scale.

7. Today's temperature was recorded at 32° F, lies in the category of Continues measurement scale.
8. Statistics has very limited number of usage in advance research studies. (False)
9. Number of dots in a single line is very good example of countable data. (True)
10. Qualitative data do not belong with the field of Statistics. (False)

Question No: 02

a) Describe the relevant fields and branches of Statistics.

Ans: A statistic is a one-number description of a set of data, or numbers used as measurements or
counts - lengths of arms, number of days, number of fish in a catcher, rarely, a number in that set.

Branches: The two main branches of statistics are descriptive statistics and inferential statistics. Both of these are employed in scientific analysis of data and both are equally important for the student of statistics.

(1) Descriptive statistics, deals with the presentation and collection of data. This is usually the first part of a statistical analysis.

- It is usually not as simple as it sounds, and the statistician needs to be aware of designing experiments, choosing the right focus group and avoid biases that are so easy to creep into the experiment.

(2) Inferential statistics, as the name suggests, involves drawing the right conclusions from the statistical analysis that has been performed using descriptive statistics. In the end, it is the inferences that make studies important and this aspect is dealt with in inferential statistics.

- Most predictions of the future and generalizations about a population by studying a smaller sample come under the purview of inferential statistics. Most social sciences experiments deal with studying a small sample population that helps determine how the population in general behaves. By designing the right experiment, the researcher is able to draw conclusions relevant to his study.

Statistics in Different Fields:

(1) Business Statistics plays an important role in business. A successful businessman must be very quick and accurate in decision making. He knows what his customers wants he should therefore know what to produce and sell and in what quantities.

(2) Economics largely depends upon statistics. National income accounts are multipurpose indicators for economists and administrators, and statistical methods are used to prepare these accounts. In economics research, statistical methods are used to collect and analyze the data and test hypotheses. The relationship between supply and demand is studied by statistical methods; imports and exports, inflation rates, and per capita income are problems which require a good knowledge of statistics.

(3) Accounting and Auditing:

Accounting is impossible without exactness. But for decision making purposes, so much precision is not essential; the decision may be made on the basis of approximation, know as statistics. The correction of the values of current assets is made on the basis of the purchasing power of money or its current value.

b) How could you elaborate the "Importance and Applications of Statistics".

Ans: STATISTICS IN RESEARCH in Research Methodology: The role of statistics in research is to function as a tool in designing research, analyzing its data and drawing conclusions there from. Most research studies result in a large volume of raw data which must be suitably reduced so that the same can be read easily and can be used for further analysis. Clearly the science of statistics cannot be ignored by any research worker, even though he may not have occasion to use statistical methods in all their details and ramifications. Classification and tabulation, as stated earlier, achieve this objective to some extent, but we have to go a step further and develop certain indices or measures to summarize the collected/classified data. Only after this we can adopt the process of generalization from small groups to population. If fact, there are two major areas of statistics which is descriptive statistics and inferential statistics. Descriptive statistics concern the development of certain indices from the raw data, whereas inferential statistics concern with the process of generalization. Inferential statistics are also known as sampling statistics and are mainly concerned with two major type of problems: the estimation of population parameters, and the testing of statistical hypotheses.

The important statistical measures, that are used to summarize the survey/research data are:

Measures of central tendency or statistical averages.

Measures of dispersion.

Measures of asymmetry (skewness).

Measures of relationship and other measures.

Application of Statistics in Business: Use of Descriptive Statistics:

Descriptive statistics are used to summarize and describe total numbers. Looking at statistical numbers such as mean, or the average number, mode, or the most frequent number, or median, or the middle number, helps managers monitor business activities and make decisions. Often numbers themselves do not show the big picture, so ratios, or numbers representing relationships are used.

Use of Inferential Statistics:

Inferential statistics help managers draw conclusions based on limited data. When predicting the future, we don't have a magic crystal ball, but we do have statistical strategies, such as sampling, probability, and models.

Marketing departments often use inferential statistics. A company might issue a survey and ask questions about their products. However, it's impossible to survey every individual customer. The marketing department will determine the appropriate sample size, or the number of people to ask. Based on the results, statisticians can infer the responses are representative of the larger group of customers.

The Role of Statistics in Computer Science: Statistics play an intrinsic role in computer science and vice versa. Statistics is used for data mining, speech recognition, vision and image analysis, data compression, artificial intelligence, and network and traffic modeling. A statistical background is

essential for understanding algorithms and statistical properties that form the backbone of computer science.

Roles of Statisticians

Statistician John Tukey (1915-2000) was key in developing ideas embraced by statisticians, such as exploratory techniques in order to better understand the data, which then leads to procedures such as hypothesis testing. Statisticians put much importance on the rigor of their analyses and incorporate theory into solving problems of uncertainty. These theories inform the methods to help establish scientific underpinnings to problems and their solutions.

Roles of Computer Scientists

Computer scientists tend to focus on data acquisition/cleaning, retrieval, mining, and reporting. They are often tasked with the development of algorithms for prediction and systems efficiency. Focus is also placed on machine learning (an aspect of artificial intelligence), particularly for the purposes of data mining (finding patterns and associations in data for a variety of purposes, such as marketing and finance).

Application of Statistics in Computer Science

There are a number of ways the roles of statisticians and computer scientists merge; consider the development of models and data mining. Typically, statistical approach to models tends to involve stochastic (random) models with prior knowledge of the data. The computer science approach, on the other hand, leans more to algorithmic models without prior knowledge of the data. Ultimately, these come together in attempts to solve problems.

Question No: 03

(4+ 6+ 4)

a) "The initial techniques which are usually prefer during transformation of data towards information are mostly recommendable during presentation of data." Elaborate the above mentioned statement precisely.

Ans: Data are usually collected in a raw format and thus the inherent information is difficult to understand. Therefore, raw data need to be summarized, processed and analyzed. However, no matter how well manipulated, the information derived from the raw data should be presented in an effective format, otherwise, it would be a great loss for both authors and readers. The techniques of data and information presentation in textual, tabular, and graphical forms are introduced. Text is the principal method for explaining findings, outlining trends, and providing contextual information. A table is best suited for representing individual information and represents both quantitative and qualitative information. A graph is a very effective visual tool as it displays data at a glance, facilitates comparison, and can reveal trends and relationships within the data such as changes over time, frequency distribution, and correlation or relative share of a whole. Text, tables, and graphs for data and information presentation are very powerful communication tools. They can make presentation easy to understand, attract and

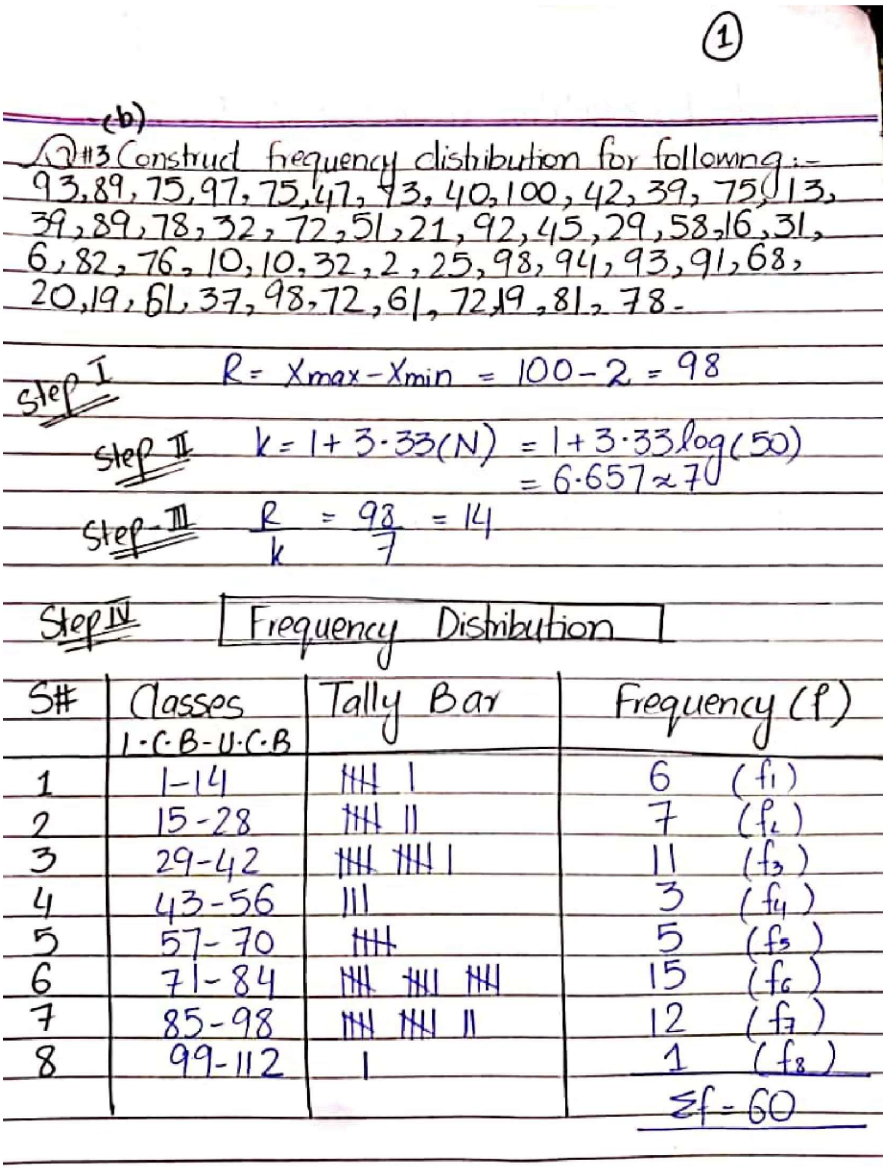
sustain the interest of readers, and efficiently present large amounts of complex information. Moreover, as journal editors and reviewers glance at these presentations before reading the whole article, their importance cannot be ignored.

b) Construct an appropriate frequency distribution for the following data related to an experimental yield.

93, 89,75, 97, 75, 47, 73, 40, 100, 42, 39, 75, 13, 39, 89, 78, 32, 72, 51, 21, 92, 45,

29, 58, 16, 31, 6, 82, 76, 10, 10, 32,2, 25, 98, 94, 93, 91, 68, 20, 19, 61, 37, 98,

72, 61, 72, 19, 81, 78.



(1)

(b)

Q#3 Construct frequency distribution for following:-
93, 89, 75, 97, 75, 47, 73, 40, 100, 42, 39, 75, 13, 39, 89, 78, 32, 72, 51, 21, 92, 45, 29, 58, 16, 31, 6, 82, 76, 10, 10, 32, 2, 25, 98, 94, 93, 91, 68, 20, 19, 61, 37, 98, 72, 61, 72, 19, 81, 78.

Step I $R = X_{max} - X_{min} = 100 - 2 = 98$

Step II $k = 1 + 3.33(N) = 1 + 3.33 \log(50)$
$= 6.657 \approx 7$

Step III $\frac{R}{k} = \frac{98}{7} = 14$

Step IV Frequency Distribution

S#	Classes L.C.B - U.C.B	Tally Bar	Frequency (f)
1	1-14	𝍸 I	6 (f_1)
2	15-28	𝍸 II	7 (f_2)
3	29-42	𝍸 𝍸 I	11 (f_3)
4	43-56	III	3 (f_4)
5	57-70	𝍸	5 (f_5)
6	71-84	𝍸 𝍸 𝍸	15 (f_6)
7	85-98	𝍸 𝍸 II	12 (f_7)
8	99-112	I	1 (f_8)
			$\Sigma f = 60$

Step V — Commulative Frequency (C.F)

$F_1 = f_0 + f_1 = 0 + 6 = 6$
$F_2 = F_1 + f_2 = 6 + 7 = 13$
$F_3 = F_2 + f_3 = 13 + 11 = 24$
$F_4 = F_3 + f_4 = 24 + 3 = 27$
$F_5 = F_4 + f_5 = 27 + 5 = 32$
$F_6 = F_5 + f_6 = 32 + 15 = 47$
$F_7 = F_6 + f_7 = 47 + 12 = 59$
$F_8 = F_7 + f_8 = 59 + 1 = 60$

Step VI — Relative Frequency

$\frac{f_1}{\Sigma f} \times 100 = 10\%$

$\frac{f_2}{\Sigma f} \times 100 = 11.66\%$

$\frac{f_3}{\Sigma f} \times 100 = 18.33\%$

$\frac{f_4}{\Sigma f} \times 100 = 5\%$

$\frac{f_5}{\Sigma f} \times 100 = 8.33\%$

$\frac{f_6}{\Sigma f} \times 100 = 25\%$

$\frac{f_7}{\Sigma f} \times 100 = 20\%$

$\frac{f_8}{\Sigma f} \times 100 = 1.66\%$

$99.8\% \approx 100\%$

Step VII **Class Boundaries**

$$\frac{L.C.L_{(2nd)} - U.C.L_{(1st)}}{2} = \frac{15-14}{2} = \frac{1}{2} = 0.5$$

Class Boundaries (C.B)

0.5 - 14.5
14.5 - 28.5
28.5 - 42.5
42.5 - 56.5
56.5 - 70.5
70.5 - 84.5
84.5 - 98.5
98.5 - 112.5

Step VIII **Class Mid Point (X)**

$$\frac{L.C.L + U.C.L}{2}$$

$= 1+14/2 = 7.5$
$= 15+28/2 = 21.5$
$= 29+42/2 = 35.5$
$= 43+56/2 = 49.5$
$= 57+70/2 = 63.5$
$= 71+84/2 = 77.5$
$= 85+98/2 = 91.5$
$= 99+112/2 = 105.5$

c) Construct the followings about the Question 3 (b).

- Simple Bar Graph & Histogram