

EXERCISE NO. 1

-:1.11:-

(1) Long term (2) Useful (3) Three ways (4) Quantitation (5) Average

-:1.12:-

- | | | | | |
|------------|-------------|-------------|------------|-----------|
| (i) False | (ii) False | (iii) True | (iv) False | (v) True |
| (vi) False | (vii) True | (viii) True | (ix) True | (x) False |
| (xi) True | (xii) False | | | |

-:1.13:-

Here Maximum value = 176
Minimum value = 119

Frequency Distribution

Classes	Tally	Frequency
118 - 123	I	1
124 - 129	II	2
130 - 135	III	3
136 - 141	III	3
142 - 147	≡	5
148 - 153	III	3
154 - 159	I	1
160 - 165	I	1
166 - 171	-	-
172 - 177	I	1
Total	----	20

-:1.14:-

Class interval or groups are given, we make the frequency table as follows:

Marks	Tally	F
0 - 9	II	2
10 - 19	≡ ≡ II	12
20 - 29	≡ I	6
30 - 39	≡ ≡ ≡	10
40 - 49	≡ ≡ ≡ II	12
50 - 59	≡ II	7
60 - 69	I	1
Total	----	50

-:1.15:-

Here Maximum value = 72

Minimum value = 62

Frequency Distribution

Classes	Tally	Frequency
60 - 62	II	2
62 - 64	II	2
64 - 66	~~III~~ III	8
66 - 68	IIII	4
68 - 70	IIII	4
70 - 72	IIII	4
72 - 74	I	1
Total	----	25

-:1.16:-

The lowest value $X_0 = 28$ and greatest value $X_n = 69$ Range = $X_n - X_0 = 69 - 28 = 41$ If we take class interval = $h = 5$, then

$$\text{The number of classes} = \frac{41}{5} = 8.2 \approx 9$$

The frequency distribution

Age	Tally	F
25 - 30	IIII	4
30 - 35	~~IIII~~ II	10
35 - 40	~~IIII~~ II	10
40 - 45	~~IIII~~	5
45 - 50	~~IIII~~ ~~IIII~~ III	13
50 - 55	IIII	4
55 - 60	----	0
60 - 65	IIII	4
65 - 70	II	2
Total	----	52

-:1.17:-

Here $X_{10} = 4.7$, and $X_0 = 1.6$

$$\text{Range} = 4.7 - 1.6 = 3.1$$

Let the number of classes = 7; $h = \frac{3.1}{7} = 0.443$. We choose $h = 0.5$.

If we begin the lowest value at 1.5, the second class would begin at 2.0 and so fourth.

The Frequency Distribution

Class Interval	Tally	F
1.5 - 1.9	III	3
2.0 - 2.4	II	2
2.5 - 2.9	~~III~~ II	7
3.0 - 3.4	~~III~~ ~~III~~ ~~III~~ II	17
3.5 - 3.9	~~III~~ ~~III~~ II	12
4.0 - 4.4	~~III~~	5
4.5 - 4.9	IIII	4
Total	-----	50

-:1.18:-

The Frequency Distribution.

Weights	Tally	F
118 - 126	~~III~~ I	6
127 - 135	~~III~~ ~~III~~	10
136 - 144	~~III~~ ~~III~~ IIII	14
145 - 153	~~III~~ ~~III~~ ~~III~~ I	16
154 - 162	~~III~~ I	6
163 - 171	~~III~~ I	6
172 - 180	II	2
Total	-----	60

-:1.19:-

Here Maximum value = 95

Minimum value = 43

Frequency Distribution

Classes	Tally	Frequency
41 - 50	~~III~~	5
51 - 60	III	3
61 - 70	IIII	4
71 - 80	~~III~~	5
81 - 90	I	1
91 - 100	I	1
Total	-----	20

-:1.20:-

Here Maximum value = 85, Minimum value = 50

Frequency Distribution

Classes	Tally	Frequency
50 - 54	III	3
55 - 59	II	2
60 - 64	~~III~~	5
65 - 69	III	3
70 - 74	~~II~~ II	7
75 - 79	II	2
80 - 84	II	2
85 - 89	I	1
Total	----	25

-:1.21:-

Here Maximum value = 54, Minimum value = 11, Interval size = 10

Frequency Distribution

Classes	Tally	Frequency
11 - 20	~~III~~ I	6
21 - 30	~~III~~ I	6
31 - 40	~~III~~ ~~III~~	10
41 - 50	II	2
51 - 60	II	2
Total	----	26

-:1.22:-

Here Maximum value = 11

Minimum value = 1

Frequency Distribution

x	Tally	Frequency
1	I	1
2	I	1
3	I	1
4	I	1
5	III	3
6	~~III~~	5
7	III	3
8	II	2
9	III	3
10	I	1
11	I	1
Total	----	22

-:1.23:-

Here Maximum value = 5, Minimum value = 0

Frequency Distribution

No of Heads	Tally	Frequency
0	II	2
1	IIII	4
2	III	6
3	IIII	7
4	IIII	5
5	I	1
Total	---	25

-:1.24:-

Here Maximum value = 9, Minimum value = 1

Frequency Distribution

Sales (Rs.) Thousand	Tally	Frequency
0.5 - 1.4	II	2
1.5 - 2.4	II	2
2.5 - 3.4	III	5
3.5 - 4.4	IIII	4
4.5 - 5.4	IIII	4
5.5 - 6.4	III	3
6.5 - 7.4	II	2
7.5 - 8.4	I	1
8.5 - 9.4	I	1
9.5 - 10.4	I	1
Total	---	25

-:1.25:-

$$X_0 = 20, \quad X_m = 97$$

$$\text{Range} = 97 - 20 = 77$$

$$\text{No. of classes} = 8, \quad h = \frac{77}{8} = 9.625 = 10$$

The Frequency Distribution

Marks	Tally	F
20 - 30	II	5
30 - 40	II II	10
40 - 50	II I	6
50 - 60	IIII	4
60 - 70	III	3
70 - 80	II	5
80 - 90	II I	6
90 - 100	I	1
Total	---	40

-:1.26:-

This is problem of discrete variable.

There will be no class limits. We will deal the whole numbers.

No. of Members	Tally	F
1	II	2
2	IIII	4
3	II	5
4	II I	6
5	II II I	11
6	II II III	13
7	II III	8
8	IIII	4
9	IIII	4
10	IIII	4
11	II	2
Total	---	63

-:1.27:-

It is the problem of discrete variable

No. of Child	Tally	F
0	I	1
1		9
2		10
3		5
4		14
5		10
6		16
7		14
8		10
9		6
10		6
11		6
12		5
12		4
Total	---	116

∴ 1.28:-

Let X represents the marks in statistics and y represents marks in Mathematics.

$$X_m = 19 \quad Y_m = 19 \quad \text{Range} = Y_m - Y_0$$

$$X_0 = 0 \quad Y_0 = 1 \quad = 19 - 1 = 18$$

$$\text{Range} = X_m - X_0 = 19 - 0 = 19$$

Let the No. of classes = 4, then

Let the No. of classes = 5

$$h = \frac{19}{4} = 4.75 = 5 \quad h = \frac{18}{5} = 3.6 = 4$$

TALLY SHEET

Stat Math	0-4	5-9	10-14	15-19	Total
0-3					5
4-7	I	I	I		3
8-11				I	9
12-15		I			8
16-19	I				7
Total	6	8	11	7	32

FREQUENCY TABLE

Stat Math	0-4	5-9	10-14	15-19	Total
0-3	2	3	---	---	5
4-7	1	1	1	---	3
8-11	2	3	3	1	9
12-15	---	1	4	3	8
16-19	1	---	3	3	7
Total	6	8	11	7	32

-:1.29:-

TALLAY SHEET

H W	20-25	25-30	30-35	35-40	40-45	45-50	Total
20-25	III	II					5
25-30		III		II			5
30-35			I	III			4
35-40			I	I	I		3
40-45					I	I	2
45-50						I	1
Total	3	5	2	6	2	2	20

FREQUENCY TABLE

H W	20-25	25-30	30-35	35-40	40-45	45-50	Total
20-25	3	2					5
25-30		3		2			5
30-35			1	3			4
35-40			1	1	1		3
40-45					1	1	2
45-50						1	1
Total	3	5	2	6	2	2	20

-:1.30:-
TALLY SHEET

Y \ X	60-62	63-65	66-68	69-71	Total
102-105	III		II		5
106-109	II	III		II	9
110-113		II	I	I	4
114-117			III	I	4
118-121		I	I	I	3
Total	5	8	7	5	25

FREQUENCY TABLE

Y \ X	60-62	63-65	66-68	69-71	Total
102-105	3		2		5
106-109	2	5		2	9
110-113		2	1	1	4
114-117			3	1	4
118-121		1	1	1	3
Total	5	8	7	5	25

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INTRODUCTION

QUESTION NO. 1

Possible answers are given to each statement. Tick (✓) the correct one.

S#	Questions	Answers			
1)	The science of statistics can be divided in branches	2	✓ 3	5	4
(Faisalabad Board, 2008)					
2)	The lifetime of a T.V table is	Discrete data	✓ Continuous data	Both types	None
(Faisalabad Board 2008)					
3)	The grouped data is	✓ Secondary data	Primary data	Individually data	None
(Faisalabad Board 2008)					
4)	Classification has important basis	✓ 2	4	5	7
(Faisalabad Board, 2008)					
5)	Frequency is denoted by	C	q	p	✓ f
(Faisalabad Board, 2008; Lahore Board 2008)					
6)	Now a days, the word statistics can be expressed in how many ways	2	✓ 3	4	5
(Lahore Board, 2008)					
7)	The data obtained from college record is	Primary	✓ Secondary	Raw	Qualitative
(Lahore Board 2008)					

S#	Questions	Answers			
8)	A measure computed from sample data is called	Parameter	✓ Statistic	Statistics	Data
(Lahore Board, 2008; Faisalabad Board, 2009)					
9)	Statistics are always	✓ Aggregate of facts and figures	True	Continuous	New
(Lahore Board, 2008, 2009; Faisalabad Board, 2010)					
10)	The grouped data is always called	Raw data	Primary data	Sample data	✓ Secondary data
11)	Population census is conducted through	Sample survey	✓ Complete enumeration	Registration	Investigation
(Lahore Board, 2008)					
12)	The word "Statistics" is believed to have been derived from Latin word	Statistic	✓ Status	Statistique	Statista
(Gujranwala Board 2009; Faisalabad Board 2010)					
13)	One way classification is done considering	✓ One variable	Two variable	Three variable	More than three variable
(Gujranwala Board, 2009)					
14)	Height of a student is an example of	Discrete variable	✓ Continuous variable	Constant	Qualitative data
(Gujranwala Board 2009; Lahore Board 2009)					
15)	Questionnaire method is used in collection of	✓ Primary data	Grouped data	Secondary data	None of these
(Gujranwala Board, 2009)					

S#	Questions	Answers			
16)	Statistics must be	✓ Comparable	✗ Not comparable	Discrete in nature	Qualitative in nature
		(Faisalabad Board, 2009)			
17)	Any data in your book for you is	Primary	Raw	✓ Secondary	False
		(Faisalabad Board, 2009)			
18)	The number of weeks in a months is an example of	✓ Discrete variable	Continuous variable	Attribute	Constant
		(Lahore Board, 2009)			
19)	Collection of data from house to house is by	Mailed questionnaire	Through enumerators	Registration	✓ Both mailed questionnaire and through enumerators
		(Lahore Board, 2009)			
20)	Non measureable quantities are	Continuous variable	Discrete variable	Constant	✓ Attribute
		(Lahore Board, 2009)			
21)	Census reports published are	Primary data	✓ Secondary data	Raw data	Simple data
		(Faisalabad Board, 2010)			
22)	A characteristic that changes from one individual to another is called	✓ Variable	Constant	Statistic	None of these
		(Lahore Board, 2010)			
23)	Raw material collected by first hand is	✓ Primary data	Secondary data	Continuous data	None of these
		(Lahore Board, 2010)			

S#	Questions	Answers			
24)	Lower class boundary of 25 – 35 will be	20	✓ 25	30	35
(Lahore Board, 2010)					
25)	Identify the attribute	Height	Blood pressure	✓ Eye colour	Marks
(Gujranwala Board, 2010; Lahore Board, 2010)					
26)	The group data is also called	Raw data	Primary data	Qualitative data	✓ Secondary data
(Lahore Board, 2010)					
27)	Statistical laws are valid in the	Short run	Medium run	✓ Long run	Average run
(Gujranwala Board, 2010)					
28)	Parameters are related to	Sample	✓ Population	Mean	Median
(Gujranwala Board, 2010)					
29)	There is no difference between the secondary data and	✓ Grouped data	Primary data	Ungrouped data	Raw data
(Gujranwala Board, 2010)					
30)	In plural sense, statistics means	Methods	✓ Numerical data*	Sample value	Population values
(Rawalpindi Board, 2010)					
31)	The number of accidents on a road on 01-01-2010 is	Continuous variable	Constant	Qualitative variable	✓ Discrete variable
(Rawalpindi Board, 2010)					
32)	The data collected from first time is called	✓ Primary data	Secondary data	Discrete data	None of these
(Sargodha Board, 2010)					

S#	Questions	Answers			
33)	The word statistics is derived from	✓ Latin word	Greek word	Italian word	None of these
(Sargodha Board, 2010)					

QUESTION NO. 2

Possible answers are given to each statement. Tick (✓) the correct one.

S#	Questions	Answers			
1)	The word "statistics" is believed to have been derived from the Latin word:	Statistik	✓ Status	Statistique	Statista
2)	Statistics is a word:	✓ Latin	Punjabi	German	Urdu
3)	Statistics means:	✓ Aggregates of facts	Computer science	Research science	Distribution of wealth
4)	Statistical laws are true on the:	✓ Average	Numerically	Individually	None of these
5)	Statistics is defined as the numerical data in:	Singular sense	✓ Plural sense	Technical sense	None of these
6)	Statistics plays an important role in:	Mathematics	Computer	Accounting	✓ Research
7)	The word statistics is now a days used in:	Two ways	✓ Three ways	Four ways	Five ways
8)	Statistics does study:	✓ Quantitative facts	Qualitative facts	Both quantitative & qualitative	None of these
9)	Statistical laws are true for:	✓ Long term	Short term	Medium term	None of these

S#	Questions	Answers			
10)	Science of systematic collection, presentation, analysis and interpretation of numerical data is called:	Commerce	✓ Statistics	Economics	Mathematics
11)	A measurable quantity which vary from one value to another is:	Constant	✓ Variable	Non of them	Both constant & variable
12)	A variable which can assume any value between two given values is a:	✓ Continuous variable	Discrete variable	Constant	None of these
13)	Data classified by attribute is called:	✓ Qualitative data	Quantitative data	Both qualitative & quantities	None of these
14)	A variable which can not assume any value between two given values is a:	Continuous variable	✓ Discrete variable	Constant	None of these
15)	Non – measurable quantities are:	Continuous variables	Discrete variable	Constant	✓ Attributes
16)	Number of weeks in a month is an example of:	Discrete variable	Continuous variable	Attribute	✓ Constant
17)	A characteristic that does not change is called:	Variable	✓ Constant	Attribute	Both variable & constant
18)	Which of the following is an example of a discrete variable:	Number of Rs. in a pocket	Height of a student in the class	✓ Number of children in a house	Daily income of a shop

S#	Questions	Answers			
19)	Which of the following variable is an example of a continuous variable:	✓ Height of a student in the class	Number of books on the table	Number of students in a class	Number of heads in tossing two coins
20)	The height of a student is an example of:	Discrete data	Qualitative data	✓ Continuous data	None of these
21)	The number of road accidents on Lahore, Faisalabad road is the example of:	Continuous variable	✓ Discrete variable	Qualitative	Non of these
22)	Which one is the continuous variable:	✓ Rainfall on different days in Multan	Number of patients coming in the hospital in a week	Number of flights landing on Lahore airport in a day	None of these
23)	Identify the attribute:	Height of a student	Blood pressure	✓ The eye colour of students	The number of TV sold in a day
24)	Which of the following is an example of discrete variable:	Business expenses	The yearly income of shop keeper	The life time of electric bulbs	✓ The number of flowers on a tree
25)	Number of days in a week is an example of:	✓ Constant	Qualitative variable	Discrete variable	Continuous variable
26)	Collection of data by Patwari is the example of:	✓ Primary data	Secondary data	Both Primary & Secondary	None of these
27)	Collection of data from house to house is by:	Mailed questionnaire	Through enumerators	Registration	✓ Both mailed questionnaire & through enumeration

S#	Questions	Answers			
28)	Publication of central statistical office, ministries of Agriculture, Finance, Communications and Railway etc are examples of:	Primary data	✓ Secondary data	Both primary & secondary	None of these
29)	The data which is not arranged is called:	Grouped data	✓ Raw data	Individual data	None of these
30)	Questionnaire method is used in the collection of:	✓ Primary data	Secondary data	Grouped data	Discrete data
31)	A numerical quantity calculated from sample is called:	Parameter	✓ Statistic	Statistics	None of these
32)	The process by which things are arranged in groups or classes is called:	✓ Classification	Tabulation	Graph	None of these
33)	One way classification is done considering:	✓ One variable	Two variables	Three variables	None of these
34)	Data grouped according to magnitude is called:	Sampling distribution	✓ Frequency distribution	Both sampling & frequency distribution	None of these
35)	Arrangement of data according to some common characteristics is called:	✓ Classification	Tabulation	Both classification & tabulation	None of these
36)	The class mark is defined as:	Class interval	Class boundary	✓ Mid point	Class limits

QUESTION NO. 3

Write the short answer to the following questions in the space provided

Q.1: Define Statistics.

(Lahore Board 2010)

(Rawalpindi Board 2010)

Ans: Statistics is defined as the science of collection, presentation, analysis and interpretation of numerical data.

Q.2: What are the meaning of the word statistics in plural sense.

(Sargodha Board, 2010)

Ans: In plural sense, the word statistics refer to the aggregates of numerical facts collected for some purpose in any field of study. For instance, statistics of births and deaths, statistics of agriculture, price statistics, etc.

Q.3: Give the meaning of the word statistics in singular sense.

(Sargodha Board, 2010)

Ans: In Singular sense, the word statistics refer to the science used in the collection, presentation, analysis and interpretation of numerical data.

Q. 4: What are the meaning of the word statistics as plural of the word "Statistic".

Ans: The word statistics is used as plural of the word statistic. By statistic, we mean a value calculated from the sample values.

Q. 5: Define population.

(Lahore Board, 2008)

(Rawalpindi & Gujranwala Boards, 2010)

Ans: Population is defined as the totality of the observations with which we are concerned.

Q. 6: What is sample?

(Lahore Board, 2008)

(Rawalpindi & Gujranwala Boards, 2010)

Ans: A sample is the representative part of the population.

Q. 7: What is parameter?

(Faisalabad Board, 2008)

(Lahore Board, 2010)

Ans: A numerical quantity calculated from population is called parameter.

Q. 8: What is statistic?

(Faisalabad Board, 2008)

(Lahore Board, 2010)

Ans: A numerical quantity calculated from sample is called statistic.

Q. 9: Name the two branches of statistics.

(Sargodha Board, 2010)

Ans: The two branches of statistics are:

- (i) Descriptive statistics (ii) Inferential statistics.

Q. 10: Define descriptive statistics.

(Lahore Board, 2008)

Ans: The branch of statistics that deals with collection, presentation and analysis of data is called descriptive statistics.

Q. 11: Define inferential statistics.

(Lahore Board, 2008)

Ans: The branch of statistics that deals with the methods that use sample results to help make decisions about a population.

Q. 12: What do you mean by "Statistical Method".

(Lahore Board, 2009)

Ans: Statistical method means the following steps:

- i) Collection of data
- ii) Organization and presentation of data
- iii) Analysis of data
- iv) Interpretation of data
- v) Preparation of report

Q. 13: What is presentation?

(Lahore Board, 2010)

Ans: Presentation is the manner or style in which some thing is expresses.

Q. 14: Give three characteristics of statistics.

(Faisalabad Board, 2008 & 2009)

Ans: Statistics are:

- (i) Aggregates of facts
- (ii) Numerically expressed
- (iii) Collected in a systematic manner for a predetermined purpose.

Q. 15: Describe two limitations of statistics.

(Rawalpindi Board, 2010)

- Ans:** (i) Statistics deals with aggregate of facts.
(ii) Statistical laws are true on the average.

Q. 16: Describe three important uses of statistics in various fields.

(Lahore Board, 2010)

- Ans:** (i) Statistics are an aid to supervision.
(ii) Planning without statistics can not be imagined.
(iii) Statistics are the eyes of administration.

Q. 17: Define three functions of statistics

(Lahore Board, 2010)

- Ans:** (i) Presentation of facts in definite form.
(ii) Statistics facilitate comparison.
(iii) Statistics tests the law of other sciences.

Q. 18: What is a constant?

(Lahore Board, 2008 & 2009)

(Faisalabad Board, 2010)

Ans: A quantity that does not change is called constant. For example: Number of days in a week, $\pi = 3.1516$, $e = 2.71828$ etc.

Q. 19: Define a variable. (Lahore Board, 2008)
(Gujranwala Board, 2010)

Ans: A variable is a symbol, such as x , y , z which can assume any of a prescribed set of values.

Q. 20: Give some examples of variable. (Lahore Board, 2009)

Ans: The weight of an individual, the number of students in a class, weekly wages, etc. are the examples of a variable.

Q. 21: Define quantitative variable. (Lahore Board, 2010)

Ans: A variable that can be measured numerically is called quantitative variable.

Q. 22: Give some examples of a quantitative variable.

Ans: Heights and weights of students, number of children per house, blood pressure, temperature etc. are the examples of quantitative variable.

Q. 23: Define qualitative variable with example. (Faisalabad Board, 2008)

Ans: A characteristics which can not be measured numerically is called qualitative variable. For example, religion, beauty, eye colour, educational level, sex etc.

Q. 24: Define discrete variable, giving examples. (Lahore Board, 2008)
(Faisalabad Board, 2010)

Ans: A discrete variable is a variable which can not theoretically assume any value between two given numbers. For example, number of accidents in a month, number of children in a family, number of student in a class.

Q. 25: Define continuous variable, giving examples. (Lahore Board, 2008)

(Faisalabad Board 2009)
(Gujranwala Board 2010)

Ans: A variable which can assume any possible value with in a range is called a continuous variable. For example, the weight of a boy, the monthly income, daily temperature, age, blood pressure etc.

Q. 26: What is data? (Faisalabad & Lahore Board, 2009; Rawalpindi Board, 2010)

Ans: The number recorded as a result of counting or measuring are called data.

Q. 27: What is ungrouped data? (Lahore Board, 2010)

Ans: The data which is not presented in the form of a frequency distribution is called ungrouped data.
