



UNIVERSITY OF THE PUNJAB
First Semester – 2019
Examination: B.S. 4 Years Program

Roll No. in Fig.

Roll No. in Words.

PAPER: Statistics-I
Course Code: STAT-101 Part-I (Compulsory)

MAX. TIME: 15 Min.
MAX. MARKS: 10

Signature of Supdt.:

Attempt this Paper on this Question Sheet only.

Please encircle the correct option. Division of marks is given in front of each question.

This Paper will be collected back after expiry of time limit mentioned above.

Q.1. Encircle the right answer, cutting and overwriting is not allowed. (1x10=10)

- i. In general, which of the following statements is FALSE?
 - a) The sample mean is more sensitive to extreme values than the median.
 - b) The sample range is more sensitive to extreme values than the standard deviation.
 - c) The sample standard deviation is a measure of spread around the sample mean.
 - d) The sample standard deviation is a measure of central tendency around the median.
- ii. Which of the following statements is NOT true?
 - a) In a symmetric distribution, the mean and the median are equal.
 - b) The first quartile is equal to the twenty-fifth percentile.
 - c) In a symmetric distribution, the median is halfway between the first and the third quartiles.
 - d) The median is always greater than the mean.
- iii. The least squares regression line is the line:
 - a) which is determined by use of a function of the distance between the observed Y and the predicted Y.
 - b) which has the smallest sum of the squared residuals of any line through the data values.
 - c) for which the sum of the residuals about the line is zero.
 - d) which has all of the above properties
- iv. Which of the following is a limitation of Statistics?
 - a) Statistical results can be generalized for the population
 - b) Statistical laws are exact.
 - c) Statistics does not study individuals.
 - d) All of these
- v. A small part of the population is called:
 - a) Finite Population
 - b) Infinite Population
 - c) Sample
 - d) Parameters

P.T.O.



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Roll No.

PAPER: Statistics-I
Course Code: STAT-101 Part – II

MAX. TIME: 2 Hrs. 45 Min.
MAX. MARKS: 50

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Q2. Explain the following: (4x5)

- i) Measures of Central Tendency
- ii) Measures of Dispersion
- iii) Index Numbers
- iv) Properties of Correlation Coefficient
- v) Components of Time Series

Q3. (a) A distribution consists of 3 components with frequencies 45, 40 and 65, (03)
having their means 2, 2.5 and 3 respectively. The standard deviations of
the three components are 1.5, 2.0 and 2.5 respectively. Find the combined
standard deviation.

(b) The following data gives the runs made by two players in their 10 innings: (06)

Player A	40	45	80	10	75	20	60	35	42	100
Player B	45	42	38	40	35	41	50	42	39	48

- i. Which player is better on average run getter?
- ii. Which player is more consistent than the other player?

Q4. The following table represents the death rate (y) in road accidents (per 100) (06)
and the maximum speed limit (x: miles per hour) in different
countries.

Y	3.0	3.3	3.4	3.5	4.1	4.3	4.7	4.9	5.1	6.1
X	55	55	55	70	55	60	55	60	60	75

- i. Estimate a linear regression model Y on X from the data.
- ii. What would be the expected death rate when speed limit is 65
miles per hour?

P.T.O.



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Roll No. in Fig.

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PAPER: Elementary Statistics-I
Course Code: STAT-101-A Part-I (Compulsory)

MAX. TIME: 15 Min.
MAX. MARKS: 10

Signature of Supdt.:

Attempt this Paper on this Question Sheet only.
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Q.1. Encircle the right answer, cutting and overwriting is not allowed. (1x10=10)

- i. The common measure of variability is _____
 - a) Standard Deviation
 - b) Mean
 - c) Geometric Mean
 - d) None of the above
- ii. The sample variance for a sample of (n) measurements is equal to the sum of the squared distances from the mean _____
 - a) Divided by (n)
 - b) Divided by (n-1)
 - c) Divided by (n+1)
 - d) Both a and b
- iii. For quantitative data, _____ is often preferred over the mode as a measure of center because the value that occurs most frequently may not necessarily be located near the center of the data set.
 - a) Mean
 - b) Median
 - c) Both a and b
 - d) None of the above
- iv. Skewness tells us about the _____ of a frequency distribution.
 - a) Centre
 - b) Shape
 - c) Both a and b
 - d) None of the above
- v. Variance is interpreted in the _____ of the data
 - a) Same units
 - b) Squared units
 - c) Different units
 - d) None of the above
- vi. Mean deviation is referred as total amount by which values deviate from _____
 - a) Standard deviation
 - b) Variance
 - c) Mean
 - d) None of the above
- vii. Median cannot be calculated in case of _____
 - a) Ordinal data
 - b) Nominal data
 - c) Ratio data
 - d) Interval data
- viii. The class interval is _____ to the difference between class boundaries
 - a) Sum
 - b) Equal
 - c) Unequal
 - d) None of the above
- ix. An appropriate scale for graphical presentation must be consistent with _____
 - a) Size of data
 - b) Diagram
 - c) Aggregate frequency
 - d) None of the above
- x. The number of bedroom in a house is a _____ variable
 - a) Discrete
 - b) Continuous
 - c) Both a and b
 - d) None of the above



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MAX. TIME: 2 Hrs. 45 Min.
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ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Q 2.	<p>Explain the following briefly</p> <ol style="list-style-type: none"> Data and Experiment Population and Sample Interval and Ratio scale of measurement Absolute and Relative Dispersion Index Numbers 	4 * 5 = 20																																								
Q 3.	<p>Following table shows frequency distribution for number of minutes per week spent watching TV by students. With reference to this table determine</p> <ol style="list-style-type: none"> The percentage of students with viewing times is at least 600 minutes but less than 900 minutes. The number of students with viewing times is at most 600 minutes. Display data in suitable diagram. <table border="1" data-bbox="523 806 986 1097"> <thead> <tr> <th>Sr. No</th> <th>Viewing Time (minutes)</th> <th>No. of Students</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>600-699</td> <td>76</td> </tr> <tr> <td>2</td> <td>700-799</td> <td>68</td> </tr> <tr> <td>3</td> <td>800-899</td> <td>62</td> </tr> <tr> <td>4</td> <td>900-999</td> <td>48</td> </tr> <tr> <td>5</td> <td>1000-1099</td> <td>22</td> </tr> <tr> <td>6</td> <td>1100-1199</td> <td>6</td> </tr> </tbody> </table>	Sr. No	Viewing Time (minutes)	No. of Students	1	600-699	76	2	700-799	68	3	800-899	62	4	900-999	48	5	1000-1099	22	6	1100-1199	6	10																			
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Q 4.	<p>a) Compute the mean, median, and mode for the following 10 incomes: \$10,000 \$8,000 \$7,000 \$5,000 \$7,000 \$1,000,000 \$9,000 \$11,000 \$8,000 \$11,000</p> <p>Which measure of central tendency is most meaningful in this case and why?</p> <p>b) Explain time series, cross sectional and pooled data with examples.</p>	5 * 2 = 10																																								
Q 5.	<p>A graduate student in Economics was asked to grade 40 final exams, selected at random from several large sections of an introductory course. The resulting scores are found below.</p> <table border="1" data-bbox="446 1406 1061 1534"> <tbody> <tr> <td>77</td><td>68</td><td>86</td><td>84</td><td>95</td><td>98</td><td>87</td><td>71</td> </tr> <tr> <td>84</td><td>92</td><td>96</td><td>83</td><td>62</td><td>83</td><td>81</td><td>85</td> </tr> <tr> <td>91</td><td>74</td><td>61</td><td>52</td><td>83</td><td>73</td><td>85</td><td>78</td> </tr> <tr> <td>50</td><td>81</td><td>37</td><td>60</td><td>85</td><td>100</td><td>79</td><td>81</td> </tr> <tr> <td>75</td><td>92</td><td>80</td><td>75</td><td>78</td><td>71</td><td>64</td><td>65</td> </tr> </tbody> </table> <p>To get information out of the data, she needed to summarize the data. So, present frequency distribution of the data. Also calculate grouped mean, variance, Karl Pearson's coefficient of skewness and standard deviation.</p>	77	68	86	84	95	98	87	71	84	92	96	83	62	83	81	85	91	74	61	52	83	73	85	78	50	81	37	60	85	100	79	81	75	92	80	75	78	71	64	65	10
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Q.1. Give short answers of the following: (6x5=30)

- i) Differentiate between PARAMETER and STATISTIC.
- ii) Explain: FREQUENCY DISTRIBUTION, CUMULATIVE FREQUENCY DISTRIBUTION
- iii) Enlist the properties of an ideal average.
- iv) Write down properties of STANDARD DEVIATION.
- v) Explain: ORDINAL and INTERVAL scales of measurement.
- vi) What is consumer price index number also list the methods of its computation.

Solve the following questions. (3x10=30)

Q.2.

a) The following data give the annual earnings (rounded to thousands of dollars) of 35 households

30 05 29 07 20 31 28 10 13 24 25 07 22
15 15 22 78 79 99 30 80 80 75 63 24 35
25 90 35 33 70 63 35 17

Prepare a frequency grouped frequency distribution clearly mentioning the steps of construction.

Q.3. Given below is the distribution of weekly income (to the nearest rupee) of 100 households in a locality A.

Income	30—39	40—49	50—59	60—69	70—79	80—89	90—99
<i>F</i>	13	15	17	28	12	10	5

Calculate: a) Arithmetic Mean b) Coefficient of Variation

Q.4.

Compute (a) Laspeyres price index number (b) Paasche's price index number of 1976 with 1961 as base form the following data.

Commodity	Quantity(units)		Value(Rs.)	
	1961	1976	1961	1976
A	100	150	600	1200
B	80	100	400	700
C	60	72	180	432
D	30	33	450	363



UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / First Semester – Spring 2022

Paper: Statistics-I

Course Code: STAT-101

Roll No.

Time: 3 Hrs.

Marks: 60

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Answer the following short questions. (15x2=30)

- (i) Differentiate between Parameter and Statistic
- (ii) Define qualitative variable and quantitative variable, give any one example of each type.
- (iii) Describe briefly the main steps in the preparation of Frequency table from raw data.
- (iv) What is a cumulative frequency curve? How does it differ from the ordinary curve?
- (v) Show that $\sum(x_i - a)^2 = \sum(x_i - \bar{x})^2 + n(\bar{x} - a)^2$ where 'a' is any arbitrary number.
- (vi) Differentiate between simple Arithmetic Mean and weighted Arithmetic Mean.
- (vii) What is meant by skewness? What are the measures of skewness, name them and also give formulae.
- (viii) The following values have been obtained from a frequency distribution of weights (lb) having 125 observation after making the substitution. $x = 16 + 5 U$, $\sum fu = -46$, $\sum fu^2 = 306$, $\sum fu^3 = -242$, and $\sum fu^4 = 1962$ check that either the distribution is Meso Kurtic or not.
- (ix) Compare the simple Index and composite Index.
- (x) Show that Fisher's ideal Index satisfies the time reversal test.
- (xi) Show that coefficient of determination r^2 is $r^2 = \frac{a\sum y + b\sum xy - c\sum y^2}{\sum y^2 - c\sum y}$
- (xii) Describe the properties of regression line.
- (xiii) What is analysis of time series.
- (xiv) Write brief note on semi average method.
- (xv) Define standard deviation of regression.

Solve the following questions.

- Q:2 (a) Find (i) Arithmetic Mean and (ii) Geometric Mean of the series. 1, 3,9, 27, 81.....3ⁿ
- (b) The mean and Variance of variable "x" are 60 and 64 respectively. Find Mean and Variance of new variable if

- (i) All the Values of x are increased by 20 points.
- (ii) All the values of x are increased by 10%. (5+5=10)

- Q:3 (a) Obtain (i) Simple aggregative value index.
(ii) An index of average value, for each year from the following data.

Years	Declared values	Values on the basis of 2010 values
2010	900	900
2011	1050	988
2012	1500	1000
2013	1700	832

- (b) For a pairs of value of two variables when each variable is ranked in order (1 to n) show that coefficient of rank correlation is $r_s = 1 - \frac{6\sum d^2}{n(n^2 - 1)}$. (5+5=10)

Q:4 (a) Compute Seasonal Indices by link Relative Method for the following data.

Year	Jan-March	April-June	July-Sep	Oct-Dec.
2001	80	101	126	92
2002	85	110	123	90
2003	83	99	125	94
2004	86	102	129	92

- (b) Fit a Straight line $y = a + bx$ from the following results for the year 1948-58 (Both inclusive)
- $\sum x = 0, \sum y = 438.9, \sum x^2 = 110$
 $\sum xy = -84.4$

(6+4=10)

Find out the estimated trend values for 1960 and 1961.