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SUBJECT CODE: **16CCP312** **CLASS** : **II M.Com. (CA)**

Ex.No.1

DESCRIPTIVE STATISTICS

Aim

To compute Mean, Median, Mode and Standard Deviation

Algorithm

Step 1:	Start the Process
Step 2:	Type the following Quantitative Data 320, 395, 342, 444, 551, 395, 425, 417, 395, 401, 390, 400 in Column Variable 1 of Data view window
Step 3:	Select Descriptive Statistics option from Analyze Menu
Step 4:	Select Frequencies option from Descriptive Sub menu
Step 5:	Forward the Variable 1 data to Variables Window
Step 6:	Select Statistics Command button on Frequencies window
Step 7:	Select Mean, Median and Mode from Central Tendency Option and Standard Deviation from Dispersion option and click Continue command button
Step 8:	Click Ok button on Frequency Window
Step 9:	Stop the process

Result

The above statistical analysis has been verified by using SPSS Package.

Output

Statistics		
VAR00001		
N	Valid	12.00
	Missing	0.00
Mean		406.25
Median		397.50
Mode		395.00
Std. Deviation		56.51

VAR00001

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	320	1	8.3	8.3	8.3
	342	1	8.3	8.3	16.7
	390	1	8.3	8.3	25.0
	395	3	25.0	25.0	50.0
	400	1	8.3	8.3	58.3
	401	1	8.3	8.3	66.7
	417	1	8.3	8.3	75.0
	425	1	8.3	8.3	83.3
	444	1	8.3	8.3	91.7
	551	1	8.3	8.3	100.0
	Total	12	100.0	100.0	

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Ex.No.2

Chi-square

Aim

To calculate Chi-square test to find association between two variables

Algorithm

Step 1:	Start the Process
Step 2:	Type two set of Qualitative data on Variable 1 and Variable 2 on Data View Window
Step 3:	Specify names for Variable 1 and Variable 2 on variable view window
Step 4:	Select Descriptive Statistics option from Analyze Menu
Step 5:	Select Crosstabs from Descriptive Sub menu
Step 6:	Forward Variable 1 to Row and Variable 2 to Column options
Step 7:	Click Statistics Command button on Crosstab window, from which select Chi-square option and press continue command button
Step 8:	Click Cell command button on Crosstab window, in which select row on percentage option and press continue command button
Step 9:	Click Ok button on Crosstab window
Step 10:	Stop the process

Result

The Chi-square test result has been verified by using SPSS Package.

Output

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
AOR * SQ	300	100.0%	0	.0%	300	100.0%

AOR * SQ Crosstabulation

			SQ			
			1	2	3	Total
AOR	1	Count	5	75	3	83
		% within AOR	6.0%	90.4%	3.6%	100.0%
	2	Count	29	94	8	131
		% within AOR	22.1%	71.8%	6.1%	100.0%
	3	Count	6	72	8	86
		% within AOR	7.0%	83.7%	9.3%	100.0%
Total		Count	40	241	19	300
		% within AOR	13.3%	80.3%	6.3%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	18.085[a]	4	.001
Likelihood Ratio	18.256	4	.001
Linear-by-Linear Association	.545	1	.460
N of Valid Cases	300		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.26.

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Ex.No.3

Independent Sample 't' Test

Aim

To calculate 't' test to find whether mean differs between two groups

Algorithm

Step 1:	Start the Process
Step 2:	Type Quantitative data on Variable 1
Step 3:	Group the Quantitative data in to two groups by assigning qualitative values (i.e.) 1,2
Step 4:	Select Compare Means from Analyze Menu
Step 5:	Select Independent Sample 't' Test from Compare Means menu
Step 6:	Forward Quantitative data to Test Variables Option and Qualitative data to Group Variables option
Step 7:	Click Define Groups command button and assign 1 and 2 at Group 1 and Group 2 and click continue command button
Step 8:	Click Ok button on Independent Sample 't' test window
Step 9:	Stop the process

Result

The above statistical analysis has been verified by using SPSS Package.

Output

Group Statistics

	VAR00002	N	Mean	Std. Deviation	Std. Error Mean
VAR00001	1	193	69.6732	13.58475	.97785
	2	107	72.9753	11.50454	1.11219

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
VAR00001	Equal variances assumed	4.822	.029	-2.127	298	.034	-3.30211	1.55281	-6.35798	-.24625
	Equal variances not assumed			-2.230	250.561	.027	-3.30211	1.48093	-6.21877	-.38546

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Ex.No.4

Paired 't' Test

Aim

To calculate paired 't' test to find whether student's performance differs before and after training programme

Algorithm

Step 1:	Start the Process
Step 2:	Type Quantitative data on Variable 1 and Variable 2
Step 3:	Select Compare Means from Analyze Menu
Step 4:	Select paired 't' Test from Compare Means menu
Step 5:	Forward Variable 1 and Variable 2 data set to Paired Variables window
Step 6:	Click Ok button on Independent Sample 't' test window
Step 7:	Stop the process

Result

The above statistical analysis has been verified by using SPSS Package.

Output

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	VAR00001 & VAR00002	9	.784	.012

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	VAR00001 - VAR00002	-1.16667E1	6.72681	2.24227	-16.83735	-6.49598	-5.203	8	.001

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Ex.No.5

Analysis of Variance (ANOVA)

Aim

To calculate ANOVA test to find whether mean differs among more than two groups

Algorithm

Step 1:	Start the Process
Step 2:	Type Quantitative data on Variable 1
Step 3:	Group the Quantitative data in to more than two groups by assigning qualitative values (i.e.) 1,2,3
Step 4:	Select Compare Means from Analyze Menu
Step 5:	Select One way ANOVA option from Compare Means menu
Step 6:	Forward Quantitative data to Dependent list and Qualitative data to Factor
Step 7:	Click Option Command button
Step 8:	Click Description option on Statistics and click continue button
Step 9:	Click Ok button on One way ANOVA window
Step 10	Stop the process

Result

The above statistical analysis has been verified by using SPSS Package.

Output

Descriptives

VAR00001

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	83	65.7420	12.40484	1.36161	63.0334	68.4507	35.86	93.10
2	131	73.1511	12.02735	1.05083	71.0722	75.2301	35.86	91.72
3	86	72.2779	13.61429	1.46807	69.3590	75.1968	42.76	93.79
Total	300	70.8510	12.95901	.74819	69.3786	72.3233	35.86	93.79

ANOVA

VAR00001					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3034.594	2	1517.297	9.552	.000
Within Groups	47178.261	297	158.849		
Total	50212.855	299			

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Ex.No.6

Correlation

Aim

To calculate Correlation to find nature of relation between dependent and independent variable

Algorithm

Step 1:	Start the Process
Step 2:	Type Dependent variables on Variable 1 and Independent variables from Variable 2, Variable 3
Step 3:	Select Correlate option from Analyze Menu
Step 4:	Select Bivariate command option from Correlate sub menu
Step 5:	Forward all the variables (Dependent and Independent variables) to variables window
Step 6:	Click Ok button on Bivariate Correlation window
Step 7	Stop the process

Result

The above statistical analysis has been verified by using SPSS Package.

Output

Correlations

		Dividend	PYD	Depreciation	PAT	VAR00005
Dividend	Pearson Correlation	1	.307	-.531	.842**	-.020
	Sig. (2-tailed)		.459	.176	.009	.963
	N	8	8	8	8	8
PYD	Pearson Correlation	.307	1	-.083	.481	.732*
	Sig. (2-tailed)	.459		.844	.228	.039
	N	8	8	8	8	8
Depreciation	Pearson Correlation	-.531	-.083	1	-.148	.247
	Sig. (2-tailed)	.176	.844		.726	.556
	N	8	8	8	8	8
PAT	Pearson Correlation	.842**	.481	-.148	1	.297
	Sig. (2-tailed)	.009	.228	.726		.475
	N	8	8	8	8	8
VAR00005	Pearson Correlation	-.020	.732*	.247	.297	1
	Sig. (2-tailed)	.963	.039	.556	.475	
	N	8	8	8	8	8

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

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Ex.No.7

Spearman Rank Correlation

Aim

To compute Spearman rank correlation to ascertain nature of relation that exists between two set of evaluators

Algorithm

Step 1:	Start the Process
Step 2:	Type students marks evaluated by two different faculty at Variable 1 and Variable 2
Step 3:	Select Correlate option from Analyze Menu
Step 4:	Select Bivariate command option from Correlate sub menu
Step 5:	Forward all the variables marks of students to variables window
Step 6:	Click Spearman option on Correlation Coefficient option
Step 7:	Click Ok button on Bivariate Correlation window
Step 8:	Stop the process

Result

Thus spearman rank test analysis has been verified by using SPSS Package.

Output

Nonparametric Correlations

Correlations

			VAR00001	VAR00002
Spearman's rho	VAR00001	Correlation Coefficient	1.000	-.359
		Sig. (2-tailed)	.	.382
		N	8	8
	VAR00002	Correlation Coefficient	-.359	1.000
		Sig. (2-tailed)	.382	.
		N	8	8

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Ex.No.8

Regression

Aim

To ascertain the combined influence of select independent variables over dependent variable, regression test is employed

Algorithm

Step 1:	Start the Process
Step 2:	Type Dependent variables data on variable 1 and independent variables data on variable 2, variable 3 etc.,
Step 3:	Select Regression option from Analyze Menu
Step 4:	Select linear command option from regression sub menu
Step 5:	Forward Dependent variable to Dependent option and Independent variables to Independent window
Step 6:	Click Ok button on Linear Regression window
Step 7:	Stop the process

Result

Thus regression test has been verified by using SPSS Package.

Output

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Sales, Depreciation, PAT, PYD[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Dividend

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.951[a]	.904	.776	.24474

a. Predictors: (Constant), Sales, Depreciation, PAT, PYD

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.695	4	.424	7.074	.070[a]
	Residual	.180	3	.060		
	Total	1.875	7			

a. Predictors: (Constant), Sales, Depreciation, PAT, PYD

b. Dependent Variable: Dividend

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.067	.324		.207	.849
	PYD	.014	.305	.014	.045	.967
	Depreciation	-1.236	.696	-.359	-1.776	.174
	PAT	.883	.217	.838	4.078	.027
	Sales	-.007	.011	-.190	-.647	.564

a. Dependent Variable: Dividend

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Ex.No.9

Factor Analysis

Aim

To find out the multi collinearity exists between variables and to find out the important factors (or) variables among the various set of variables introduced

Algorithm

Step 1:	Start the Process
Step 2:	Type qualitative data on data view window
Step 3:	Select Data reduction option from Analyze Menu
Step 4:	Select factor analysis command option from data reduction sub menu
Step 5:	Forward all the variables introduced to variables option
Step 6:	Select Descriptive command window, and select KMO and Bartlett's test of Sphercity option and click continue command button
Step 7:	Select Rotation command button on Factor analysis window, and select varimax option and click continue command button
Step 8:	Click Ok button on Factor Analysis window
Step 9:	Stop the process

Result

Thus factor test has been verified by using SPSS Package.

Output

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.908
Bartlett's Test of Sphericity	Approx. Chi-Square	3.947E3
	df	406
	Sig.	.000

Rotated Component Matrix[a]

	Component						
	1	2	3	4	5	6	7
VAR00001	.585	.192	.452	.085	.235	.045	.307
VAR00002	.325	-.052	.233	.512	.317	-.052	.185
VAR00003	.131	.173	.124	.163	.140	.167	.752
VAR00004	.121	.202	.598	-.160	.102	.038	.066
VAR00005	.258	.233	-.137	.538	.168	.213	.226
VAR00006	.105	.064	.750	.229	.063	.012	-.041
VAR00007	.389	.263	.004	.392	.081	.257	.406
VAR00008	.700	.254	.394	.074	.193	.052	.181
VAR00009	.277	.062	.039	.315	.525	.129	.141
VAR00010	.407	.219	.053	.136	.093	.043	.586
VAR00011	-.040	.169	.569	-.238	-.107	.212	.328
VAR00012	.344	.108	-.059	.690	.033	.253	.065
VAR00013	.138	.328	.651	.136	.076	.072	.039
VAR00014	.796	.106	.058	.259	.133	.213	.102
VAR00015	.016	.134	.043	.267	.641	.012	.361
VAR00016	.140	.642	.348	-.115	-.015	.148	.173
VAR00017	.430	-.012	.102	.417	-.021	.425	.136
VAR00018	.010	.580	.359	.283	.173	.191	.188
VAR00019	.768	.096	-.016	.206	.171	.299	.068
VAR00020	.185	.058	.171	-.106	.737	.084	.082
VAR00021	.121	.655	.114	-.123	.176	-.099	.228
VAR00022	.073	-.156	.204	.382	.196	.603	.234
VAR00023	.213	.658	.191	.344	.036	.151	-.001
VAR00024	.590	.092	.222	.233	.298	.309	.066

VAR00025	.205	.323	-.051	.107	.582	.181	-.126
VAR00026	.037	.477	.231	.124	.248	-.066	.439
VAR00027	.248	.007	.082	.027	.061	.769	.069
VAR00028	.083	.554	.162	.486	.168	-.098	.086
VAR00029	.315	.351	.028	.088	.173	.639	-.017

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 15 iterations.

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Ex.No.10

Kolmogorov and Smirnov Test

Aim

To test whether the data is normally distributed or uniformly distributed

Algorithm

Step 1:	Start the Process
Step 2:	Type qualitative data on data view window
Step 3:	Select Non Parametric Test Option from Analyze Menu
Step 4:	Select 1 Sample KS command option from Non Parametric Test sub menu
Step 5:	Forward all the variables to Test variables list window
Step 6:	Click poisson option at Test distribution
Step 7:	Click Ok button on One Sample Kolmogorov Smirnov test window
Step 8:	Stop the process

Result

Thus Kolmogorov Smirnov analysis has been verified by using SPSS Package.

Output

One-Sample Kolmogorov-Smirnov Test

		VAR00001	VAR00002	VAR00003	VAR00004
N		30	30	30	30
Normal Parameters[a]	Mean	1.1333	3.2000	3.8000	1.8667
	Std. Deviation	.34575	.40684	.40684	.34575
Most Extreme Differences	Absolute	.517	.488	.488	.517
	Positive	.517	.488	.312	.350
	Negative	-.350	-.312	-.488	-.517
Kolmogorov-Smirnov Z		2.831	2.676	2.676	2.831
Asymp. Sig. (2-tailed)		.000	.000	.000	.000

a. Test distribution is Normal.

One-Sample Kolmogorov-Smirnov Test 2

		VAR00001	VAR00002	VAR00003	VAR00004
N		30	30	30	30
Poisson Parameter[a]	Mean	1.1333	3.2000	3.8000	1.8667
Most Extreme Differences	Absolute	.322	.380	.332	.310
	Positive	.180	.219	.332	.287
	Negative	-.322	-.380	-.273	-.310
Kolmogorov-Smirnov Z		1.763	2.081	1.819	1.698
Asymp. Sig. (2-tailed)		.004	.000	.003	.006

a. Test distribution is Poisson.

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Ex.No.11

Mann Whitney U Test

Aim

To test whether two independent samples are drawn from the same population or not

Algorithm

Step 1:	Start the Process
Step 2:	Type Quantitative data on variable 1 and qualitative data on variable 2 for grouping of data
Step 3:	Select Non Parametric Test Option from Analyze Menu
Step 4:	Select 2 Independent Sample option from Non Parametric Test sub menu
Step 5:	Forward variable 1 to Test Variable list
Step 6:	Forward variable 2 to Grouping variables
Step 7:	Click Define group command button and type qualitative data entered in Group 1 and Group 2 and click command button
Step 8:	Click Ok button on 2 Independent Sample test window
Step 9:	Stop the process

Result

Thus Mann Whitney U Test has been verified by using SPSS Package.

Output

Ranks

	VAR00002	N	Mean Rank	Sum of Ranks
VAR00001	1	15	12.90	193.50
	2	12	15.38	184.50
	Total	27		

Test Statistics[b]

	VAR00001
Mann-Whitney U	73.500
Wilcoxon W	193.500
Z	-.806
Asymp. Sig. (2-tailed)	.420
Exact Sig. [2*(1-tailed Sig.)]	.427[a]

a. Not corrected for ties.

b. Grouping Variable: VAR00002

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Ex.No.12

Wilcoxon Test

Aim

To test whether ranks given by two faculties are similar

Algorithm

Step 1:	Start the Process
Step 2:	Type Quantitative data on variable 1 and variable 2
Step 3:	Select Non Parametric Test Option from Analyze Menu
Step 4:	Select Two Related Sample option from Non Parametric Test sub menu
Step 5:	Forward variable 1 and variable 2 to Test Pair window
Step 6:	Click Ok button on 2 Independent Sample test window
Step 7:	Stop the process

Result

Thus Wilcoxon Test has been verified by using SPSS Package.

Output

Ranks

		N	Mean Rank	Sum of Ranks
VAR00002 - VAR00001	Negative Ranks	11[a]	9.23	101.50
	Positive Ranks	4[b]	4.62	18.50
	Ties	1[c]		
	Total	16		

a. VAR00002 < VAR00001

b. VAR00002 > VAR00001

c. VAR00002 = VAR00001

Wilcoxon Signed Ranks Test

Test Statistics[b]

	VAR00002 - VAR00001
Z	-2.358[a]
Asymp. Sig. (2-tailed)	.018

a. Based on positive ranks.

b. Wilcoxon Signed Ranks Test

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Ex.No.13

Friedman Rank Test

Aim

To identify significant factors among set of factors introduced

Algorithm

Step 1:	Start the Process
Step 2:	Type Quantitative data on variable 1, variable 2 etc.,
Step 3:	Select Non Parametric Test Option from Analyze Menu
Step 4:	Select K Related Sample option from Non Parametric Test sub menu
Step 5:	Forward all the variables to Test variables window
Step 6:	Click Ok button on Test for Several related samples window
Step 7:	Stop the process

Result

Thus Friedman Test has been verified by using SPSS Package.

Output

Friedman Test

Ranks

	Mean Rank
VAR00001	7.24
VAR00002	3.62
VAR00003	3.42
VAR00004	3.46
VAR00005	5.05
VAR00006	6.17
VAR00007	7.25
VAR00008	7.54
VAR00009	7.99
VAR00010	8.15
VAR00011	8.60
VAR00012	9.52

Test Statistics[a]

N	1000
Chi-Square	3.838E3
df	11
Asymp. Sig.	.000

a. Friedman Test

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Ex.No.14

Kruskal Wallis H-Test

Aim

To identify whether mean differs among various group of respondents

Algorithm

Step 1:	Start the Process
Step 2:	Type Quantitative data on variable 1
Step 3:	Type Qualitative data on variable 2 for grouping of data
Step 4:	Select Non Parametric Test Option from Analyze Menu
Step 5:	Select K Independent Sample option from Non Parametric Test sub menu
Step 6:	Forward Quantitative variable to Test Variable List
Step 7:	Forward Qualitative variable to Grouping Variable
Step 8:	Type Minimum and Maximum variables on Grouping Window and click continue button
Step 9:	Click Ok button
Step 10	Stop the process

Result

Thus Kruskal Wallis Test has been verified by using SPSS Package.

Output

Kruskal-Wallis Test

Ranks

	VAR00002	N	Mean Rank
VAR00001	1	83	118.46
	2	131	165.15
	3	86	159.10
	Total	300	

Test Statistics[a,b]

	VAR00001
Chi-Square	15.921
df	2
Asymp. Sig.	.000

a. Kruskal Wallis Test

b. Grouping Variable: VAR00002

Enable | Enlighten | Enrich
(Deemed to be University)
(Under Section 3 of UGC Act 1956)

KARPAGAM ACADEMY OF HIGHER EDUCATION

(Deemed University Established Under Section 3 of UGC Act 1956)
Coimbatore - 641021.
(For the candidates admitted from 2016 onwards)
DEPARTMENT OF COMMERCE

SUBJECT : **SPSS**
SEMESTER : **III**
SUBJECT CODE: **16CCP312** **CLASS** : **II M.Com. (CA)**

Ex.No.15

Garrett Ranking

Aim

To rank the variables or factors on the basis of order of importance Garett Ranking test is employed.

Algorithm

Step 1:	Start the Process
Step 2:	Type 'n' number of numbers according to number of variables considered for the study
Step 3:	Subtract the 'n' number with 0.5
Step 4:	Result obtained from subtraction are to be multiplied by 100
Step 5:	Divide the multiplied values with 'n' numbers
Step 6:	By ascertaining Garett ranking table, weightage may be assigned for 'n' numbers
Step 7:	Calculate simple frequency for the variables
Step 8:	Multiply simple frequency values with weightage, obtained from Garett ranking table
Step 9:	Add all the multiplied values and divide the same from 'n' numbers
Step 10	Resultant output may be ranked in descending order
Step 11:	Stop the process

Result

Thus Garett ranking test has been computed

Level of Influence – Garett Ranking

Description	I (79)	II (66)	III (57)	IV (50)	V (43)	VI (34)	VII (21)	Total	Total Score	Mean Score	Rank
Security	17	30	33	33	18	24	45	200	9389	46.95	7
	1343	1980	1881	1650	774	816	945				
Reliability	23	10	29	40	42	31	25	200	9515	47.58	6
	1817	660	1653	2000	1806	1054	525				
Easy to use	48	27	19	31	27	29	19	200	10753	53.77	2
	3792	1782	1083	1550	1161	986	399				
Convenience	27	35	29	20	24	33	32	200	9922	49.61	3
	2133	2310	1653	1000	1032	1122	672				
Responsiveness	23	34	29	16	27	36	35	200	9634	48.17	5
	1817	2244	1653	800	1161	1224	735				
Speed	35	41	32	37	19	14	22	200	10900	54.50	1
	2765	2706	1824	1850	817	476	462				
Cost Effective	27	22	28	24	44	33	22	200	9857	49.29	4
	2133	1452	1596	1200	1892	1122	462				

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16CCP312

Semester – III

L	T	P	C
-	-	4	2

SPSS

Course Objectives

- To educate students on purpose of applying various statistical tools
- To train students on method of carrying out statistical analysis with the help of SPSS

Learning Course

- Assists students to carry out statistical analysis for their project

1. Descriptive Statistics
2. Chi-square
3. Independent Sample 't' Test
4. Paired 't' Test
5. Analysis of Variance (ANOVA)
6. Karl Pearson Correlation
7. Spearman Rank Correlation
8. Regression
9. Factor Analysis
10. Kolmogorov and Smirnov test
11. Mann Whitney U Test
12. Wilcoxon Test
13. Friedman Rank Test
14. Kruskal Wallis H-Test
15. Garett Ranking