

ST. PHILOMENA'S COLLEGE (AUTONOMOUS), MYSORE			
PG DEPARTMENT OF ECONOMICS			
QUESTION BANK (Revised Curriculum 2020-22)			
SECOND YEAR- THIRD SEMESTER (2020-22 Batch)			
Sub: Code- C0210 COURSE TITLE (PAPER TITLE):RESEARCH METHODOLOGY AND DATA ANALYSIS QP Code: 80321			
Unit	Sl.No	Questions	Marks
1	1	What is Research?	2
1	2	State hypothesis?	2
1	3	What does social science research means?	2
1	4	Write two objectives of research?	2
1	5	Define pure research.	2
1	6	What is exploratory research?	2
1	7	What is a survey?	2
1	8	Define Quota samples?	2
1	9	What do you mean by scientific approach?	2
1	10	Define analytical Research?	2
2	11	What is sample?	2
2	12	Give the meaning of Literature Review.	2
1	13	Define Historical Research.	2
2	14	Mention any two limitations of Case study.	2
2	15	Mention any two objectives of Literature Review.	2
2	16	Write any two steps involved in research process.	2
2	17	What are the two types of Sampling Designs?	2
2	18	What does Sampling means?	2
2	19	Define Probability sampling technique.	2
2	20	Define Non-Probability sampling technique.	2
2	21	What are the characteristics of Quota sampling?	2
2	22	What does Case study refers to?	2

2	23	What do you mean by field editing?	2
2	24	What is evaluation literature?	2
1	25	Define Action Research.	2
1	26	Mention the data sources available for cooperation.	2
2	27	Define Sampling Error.	2
2	28	What is coding?	2
2	29	What does editing means?	2
2	30	What is transcription editing?	2
3	31	Define hypothesis.	2
3	32	Distinguish between the Type and Type two error.	2
3	33	What is the formula for single sample T test?	2
3	34	Write the formula of single sample variance test.	2
3	35	When t- distribution is used?	2
4	36	When binomial distribution is used?	2
4	37	Based on the two sample show below, can we infer at 5% significance level that the location of population 1 is to the left of the location of population 2? Use Wilcoxon rank test. Sample 1:22,23,20 sample 2: 18, 27,26	2
4	38	Use the sign test to test the hypothesis at the 5% level of significance that the median number of hours a student before mathematics test is 3. 6,5,1,2,2,5,7,5,3,7,4,7.	2
4	39	Use the Wilcoxon signed-rank test to test the median life expectancy of the tyres is not greater than 60,000 miles at 5% level of significance:(Critical Value- 6) 62, 63, 59, 56, 61, 60, 64, 57	2
4	40	A coin is tossed 20 times and the following sequence of heads (H) and tails (T) is obtained. Use run test to determine at 5% level of significance if the coin is unbiased.	2

		H T T H H T T H T H H H T T H H T H H H	
4	41	Define factor analysis.	2
4	42	What are the important methods of factor analysis?	2
4	43	What do you mean by centroid method?	2
4	44	Define principle component method.	2
4	45	What do you mean by maximum likelihood method?	2
4	46	What are the merits and demerits of factor analysis?	2
4	47	Distinguish between R-type and Q-type of factor analysis.	2
4	48	Distinguish between one-way and two-way ANOVA.	2
4	49	What are the normality assumptions?	2
4	50	When the Z-distribution is used?	2
4	51	What are the purposes of chi-square test?	2
4	52	Distinguish between footnotes and bibliography.	2
4	53	Distinguish between Univariate and multivariate data analysis.	2
4	54	Distinguish between descriptive and inferential statistics.	2
4	55	What do you mean by non-parametric tests?	2
4	56	What are the types of reports?	2
4	57	What do you mean by documentation?	2
4	58	What are the different types of scales?	2
4	59	Distinguish between time-series and cross-sectional data.	2
4	60	Distinguish between qualitative and quantitative variables.	2
4	61	What do you mean by dummy variable?	2
4	62	Distinguish between correlation and regression.	2
4	63	Distinguish between simple and multiple regression.	2
4	64	What are the types of correlation?	2
4	65	When we use paired sample t-test?	2

4	66	Define ANACOVA.	2
4	67	Define Goodness of fit.	2
4	68	What are the conditions for applying the Chi-square test?	2
4	69	What are the uses of Chi-square test?	2
4	70	Distinguish between null and alternative hypothesis.	2
4	71	A sample of 900 members is found to have a mean of 3.47cm. can it be reasonably regarded as a simple sample from a large population with mean 3.23cm and standard deviation 2.31 cm?	2
4	72	What are the limitations of non-parametric test?	2
4	73	What are the factor scores?	2
4	74	What are the main objectives of factor analysis?	2
4	75	Mention the features of good research report.	2
4	76	What do you mean by rewriting and polishing of report.	2
4	77	What are the types of bibliography is followed in research.	2
4	78	What do you mean by technical report?	2
4	79	What do you mean by popular report?	2
4	80	What are the research ethics?	2
1	1	Explain various types of research?	5
2	2	Write a note on sampling techniques?	5
1	3	Describe the steps involved in research?	5
3	4	Explain different types of hypothesis?	5
2	5	Explain the characteristics of a good sample?	5
2	6	Explain simple random sample with an example?	5
1	7	Explain the objective of social science research?	5
1	8	Write a note on descriptive and diagnostic research?	5

1	9	Critically examine the exploratory research?	5									
1	10	Explain the importance of literature review?	5									
1	11	Describe pure and analytical research?	5									
2	12	Explain the procedure of case study?	5									
2	13	Briefly explain the non-probability sampling method?	5									
2	14	Write a note on footnotes and bibliography?	5									
1	15	Explain any two types of report?	5									
4	16	Write a difference between parametric and non-parametric test?	5									
2	17	Write a note one editing?	5									
2	18	What are the factors to be considered for identification of research problem?	5									
2	19	What constitute a research topic?	5									
2	20	What are the limitations encountered with a research project?	5									
1	21	Why do we need research in economics?	5									
2	22	Discuss the importance of quantitative research in economics?	5									
2	23	Discuss the various techniques of probability sampling?	5									
2	24	Discuss the uses of statistical method in research?	5									
3	25	<div>Test whether two samples have same standard deviation and being to one and same universe. (Critical Value- 3.10 at 5% level of Significance)</div> <table><tr><td>Sample A</td><td>N=10</td><td>S²₁=13.3</td></tr><tr><td>Sample B</td><td>N=12</td><td>S²₂=28.5</td></tr></table>	Sample A	N=10	S ² ₁ =13.3	Sample B	N=12	S ² ₂ =28.5	5			
Sample A	N=10	S ² ₁ =13.3										
Sample B	N=12	S ² ₂ =28.5										
3	26	<div>Intelligence test on two groups of boys and girls gave the following results: is there a significant difference in the mean scores obtained by boys and girls?</div> <table><tr><td></td><td>Girls</td><td>Boys</td></tr><tr><td>No of samples</td><td>150</td><td>250</td></tr><tr><td>Average</td><td>75</td><td>70</td></tr></table>		Girls	Boys	No of samples	150	250	Average	75	70	5
	Girls	Boys										
No of samples	150	250										
Average	75	70										

		S.D	15	20														
3	27	<p>Sample of sales in similar shops two towns are taken for a new product.</p> <table><tr><td>Town</td><td>Mean sales</td><td>Variance</td><td>Size of samples</td></tr><tr><td>1</td><td>42</td><td>4.3</td><td>6</td></tr><tr><td>2</td><td>55</td><td>5.1</td><td>8</td></tr></table> <p>Is there any differences in sales in the two towns? Use 5% level of significance (Table value-5.14)</p>				Town	Mean sales	Variance	Size of samples	1	42	4.3	6	2	55	5.1	8	5
Town	Mean sales	Variance	Size of samples															
1	42	4.3	6															
2	55	5.1	8															
3	28	<p>A random sample of 17 agriculture labors have a mean income of 30000 and a S.D of 8000.A random sample of 18 non-agricultural works have mean income of 33000 and a S.D of 8300 .test the claim at $\alpha = 0.05$ that the mean annual income of agriculture and nan-agriculture workers are not same. (Critical value=2.042)</p>				5												
3	29	<p>Following data show dividend yield between stocks listed BSE and NSE.is there a difference in average yield between two markets? Test at percent level of significance critical value=1.96.</p> <table><tr><td></td><td>BSE</td><td>NSE</td></tr><tr><td>N</td><td>22</td><td>28</td></tr><tr><td>Mean</td><td>4.21</td><td>3.62</td></tr><tr><td>SD</td><td>1.40</td><td>1.22</td></tr></table>					BSE	NSE	N	22	28	Mean	4.21	3.62	SD	1.40	1.22	5
	BSE	NSE																
N	22	28																
Mean	4.21	3.62																
SD	1.40	1.22																
3	30	<p>Heights of teachers : 63,65,58,69,71,72 Heights of soldier: 61,62,65,66,69,69,70,71,72,73 in inches. Can the heights of teachers and soldiers regarded as same on an average table value=2.145</p>				5												
3	31	<p>Two random samples gave the following results. Use F-test to find whether the samples come from the same normal population at 5% level of significance.</p> <table><tr><td></td><td>Size</td><td>Sample Mean</td><td>Sum of Squared</td></tr><tr><td>Sample I</td><td>10</td><td>15</td><td>90</td></tr><tr><td>Sample II</td><td>12</td><td>14</td><td>108</td></tr></table>					Size	Sample Mean	Sum of Squared	Sample I	10	15	90	Sample II	12	14	108	5
	Size	Sample Mean	Sum of Squared															
Sample I	10	15	90															
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3	32	<p>Test whether two samples have same standard deviation and being to one and same universe.</p>				5												

		<table><tr><td>Sample A</td><td>N=10</td><td>$S^2_1=13.3$</td></tr><tr><td>Sample B</td><td>N=12</td><td>$S^2_2=28.5$</td></tr></table>	Sample A	N=10	$S^2_1=13.3$	Sample B	N=12	$S^2_2=28.5$											
Sample A	N=10	$S^2_1=13.3$																	
Sample B	N=12	$S^2_2=28.5$																	
3	33	<p>Find the critical difference between the data given below of three sales men X,Y,Z by using this results:(Critical Value—3.98)</p> <table><tr><td>Source of Variation</td><td>Sum of Square</td><td>Degrees of freedom</td><td>Mean Square</td></tr><tr><td>Between samples</td><td>10</td><td>2</td><td>5</td></tr><tr><td>Within samples</td><td>30</td><td>11</td><td>2.75</td></tr><tr><td>Total</td><td>40</td><td>13</td><td></td></tr></table>	Source of Variation	Sum of Square	Degrees of freedom	Mean Square	Between samples	10	2	5	Within samples	30	11	2.75	Total	40	13		5
Source of Variation	Sum of Square	Degrees of freedom	Mean Square																
Between samples	10	2	5																
Within samples	30	11	2.75																
Total	40	13																	
3	34	<p>Find the critical difference between the data given below of three sales men A,B,C, by using this results.</p> <table><tr><td>Source of Variation</td><td>Sum of Square</td><td>Degrees of freedom</td><td>Mean Square</td></tr><tr><td>Between samples</td><td>20</td><td>2</td><td>10</td></tr><tr><td>Within samples</td><td>30</td><td>10</td><td>3</td></tr><tr><td>Total</td><td>50</td><td>12</td><td></td></tr></table>	Source of Variation	Sum of Square	Degrees of freedom	Mean Square	Between samples	20	2	10	Within samples	30	10	3	Total	50	12		5
Source of Variation	Sum of Square	Degrees of freedom	Mean Square																
Between samples	20	2	10																
Within samples	30	10	3																
Total	50	12																	
3	35	<p>Find the critical difference between the data given below of three sales men A,B,C, by using this results.</p> <table><tr><td>Source of Variation</td><td>Sum of Square</td><td>Degrees of freedom</td><td>Mean Square</td></tr><tr><td>Between samples</td><td>40</td><td>2</td><td>20</td></tr><tr><td>Within samples</td><td>60</td><td>12</td><td>5</td></tr><tr><td>Total</td><td>100</td><td>14</td><td></td></tr></table>	Source of Variation	Sum of Square	Degrees of freedom	Mean Square	Between samples	40	2	20	Within samples	60	12	5	Total	100	14		5
Source of Variation	Sum of Square	Degrees of freedom	Mean Square																
Between samples	40	2	20																
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Total	100	14																	
3	36	<p>A manufacturing company has purchased three new machines of different makes and wishes to determine whether one of them is faster than the others in producing a certain output, Five hourly production figures are observed at random from each machine and the results are. Use analysis of variance and determine whether the machines are significantdifferent in their mean speed (Given at 5% level F = 3.89).</p> <table><tr><td>Observation</td><td>X</td><td>Y</td><td>Z</td></tr><tr><td>1</td><td>5</td><td>3</td><td>4</td></tr></table>	Observation	X	Y	Z	1	5	3	4	5								
Observation	X	Y	Z																
1	5	3	4																

			2	3	9	3		
			3	6	8	8		
			4	8	2	5		
			5	3	5	8		

3	37	<p>Fit the one-way ANOVA table for the data given below at 5% level of significance:(Critical Value—2.62)</p> <table><tr><td>Bhopal</td><td>19</td><td>8</td><td>12</td><td>14</td></tr><tr><td>Indore</td><td>14</td><td>10</td><td>10</td><td>6</td></tr><tr><td>Gwalior</td><td>4</td><td>10</td><td>8</td><td>8</td></tr></table>	Bhopal	19	8	12	14	Indore	14	10	10	6	Gwalior	4	10	8	8	5
Bhopal	19	8	12	14														
Indore	14	10	10	6														
Gwalior	4	10	8	8														

3	38	<p>A test was given to 5 students chosen at random from the M.Com. Class of three universities in Madhya Pradesh. Their scores were found as follow between the scores of students in the three universities. Test whether there is any significant difference in the scores at 5% level of significance.(Critical Value—3.44)</p> <table><tr><td></td><td colspan="5">University Scores</td></tr><tr><td>A</td><td>90</td><td>70</td><td>60</td><td>50</td><td>80</td></tr><tr><td>B</td><td>70</td><td>40</td><td>50</td><td>40</td><td>50</td></tr><tr><td>C</td><td>60</td><td>50</td><td>60</td><td>70</td><td>60</td></tr></table>		University Scores					A	90	70	60	50	80	B	70	40	50	40	50	C	60	50	60	70	60	5
	University Scores																										
A	90	70	60	50	80																						
B	70	40	50	40	50																						
C	60	50	60	70	60																						

3	39	<p>Study the performance of three detergents at three different water temperatures, the following 'whiteness' readings were obtained with specially designed equipment Perform a one-way analysis of variance, using 5% level of significance (given F=).</p> <table><tr><td></td><td>A</td><td>B</td><td>C</td></tr><tr><td>Cold Water</td><td>5</td><td>5</td><td>6</td></tr><tr><td>Warm Water</td><td>4</td><td>5</td><td>6</td></tr><tr><td>Hot Water</td><td>5</td><td>4</td><td>5</td></tr></table>		A	B	C	Cold Water	5	5	6	Warm Water	4	5	6	Hot Water	5	4	5	5
	A	B	C																
Cold Water	5	5	6																
Warm Water	4	5	6																
Hot Water	5	4	5																

4	40	<p>To test the claim that the median age of mathematics faculty in the state community colleges is at least 42 years. The results from a random sample of 16 mathematics faculty gave the following ages. (In years). Use sign test at the 5% level of</p>	5
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		significance. 56,62,61,54,52,32,24,35,50,42,52,49,26,31,31,54																	
4	41	A teacher claims that the median time to do a particular type of mathematics problem is at most 3 minutes, but her students believes that the median time is more than 3 minutes. A random sample of 10 students completed the problem in the following times (in minutes): use the sign test at 5% level of significance to test teachers claim. 2.5, 2, 4, 4.5, 4, 2.5, 4.5, 3, 3.5 ,5	5																
4	42	Use the Wilcoxon sign test to test Big Burger’s claim that the median number of hours put in by their senior citizen employees is less than 16 hours per week at 5% level of significance. (Critical Value- 4) 15, 18, 16, 14, 20, 16, 17, 17, 12, 15.	5																
4	43	For the following data , test the hypothesis that the median measure in the population X is less than the median measure in the population Y, using Mann-Whitney U-test at 5% level of significance: <table border="1"><tr><td>X</td><td>60</td><td>45</td><td>23</td><td>32</td><td>-</td><td>-</td><td>-</td></tr><tr><td>Y</td><td>10</td><td>25</td><td>20</td><td>54</td><td>32</td><td>65</td><td>8</td></tr></table>	X	60	45	23	32	-	-	-	Y	10	25	20	54	32	65	8	5
X	60	45	23	32	-	-	-												
Y	10	25	20	54	32	65	8												
4	44	Test the hypothesis that median HDL cholesterol levels in adult population of city A and City B are the same. Use the following observations and use the Mann-Whitney test at 5% level of significance <table border="1"><tr><td>City A</td><td>42</td><td>20</td><td>51</td><td>39</td><td>57</td><td>60</td><td>23</td></tr><tr><td>City B</td><td>30</td><td>42</td><td>25</td><td>29</td><td>35</td><td>-</td><td>-</td></tr></table>	City A	42	20	51	39	57	60	23	City B	30	42	25	29	35	-	-	5
City A	42	20	51	39	57	60	23												
City B	30	42	25	29	35	-	-												
4	45	A group of 25 men (M) and 15 women(W) queue up to purchase the tickets for the premier show of a movie in the following order. Test for the randomness of the people in the queue at 5% level of significance; W, M,M,M, W,W, M, W, M,W, M,M, W, M,M,M, W,W,W, M,M,M, W,W, M,M,M,M, W,W, M,M,M,M, W,W M,M,M,M.	5																
4	46	From the following data find out whether there is any relationship between the sex and preference of colour:Apply	5																

		<p>the Chi-square test for the data given below. Test the effectiveness of Chloromycetin in checking typhoid at 5 % level (the chi-square at 5% level of significance critical Value-3.841)</p> <table><tr><td>Colour</td><td>Males</td><td>Females</td><td>Total</td></tr><tr><td>Red</td><td>10</td><td>40</td><td>50</td></tr><tr><td>White</td><td>70</td><td>30</td><td>100</td></tr><tr><td>Green</td><td>30</td><td>20</td><td>50</td></tr><tr><td>Total</td><td>110</td><td>90</td><td>200</td></tr></table>	Colour	Males	Females	Total	Red	10	40	50	White	70	30	100	Green	30	20	50	Total	110	90	200	
Colour	Males	Females	Total																				
Red	10	40	50																				
White	70	30	100																				
Green	30	20	50																				
Total	110	90	200																				
4	47	<p>For the data given below state whether the new treatment is comparatively superior to the conventional treatment. Test the chi-square at 5% level of Significance (critical Value-3.84).</p> <table><tr><td>Treatment</td><td colspan="2">No of Patients</td></tr><tr><td></td><td>Favourable Response</td><td>No. Response</td></tr><tr><td>New</td><td>60</td><td>20</td></tr><tr><td>Conventional</td><td>70</td><td>50</td></tr></table>	Treatment	No of Patients			Favourable Response	No. Response	New	60	20	Conventional	70	50	5								
Treatment	No of Patients																						
	Favourable Response	No. Response																					
New	60	20																					
Conventional	70	50																					
4	48	<p>For the data given below apply chi-square and test which holiday is preferred and does gender affect preferred holidays at 5% level of significance:</p> <table><tr><td></td><td>Beach</td><td>Cruise</td></tr><tr><td>Men</td><td>209</td><td>280</td></tr><tr><td>Women</td><td>225</td><td>248</td></tr></table>		Beach	Cruise	Men	209	280	Women	225	248	5											
	Beach	Cruise																					
Men	209	280																					
Women	225	248																					
4	49	<p>Find out the Coefficient of Correlation between X and Y by the method of Rank-Differences.</p> <table><tr><td>Scores-X—15, 18, 22, 17, 19, 20, 16, 21</td></tr><tr><td>Scores-Y—40, 42, 50, 45, 43, 46, 41, 41</td></tr></table>	Scores-X—15, 18, 22, 17, 19, 20, 16, 21	Scores-Y—40, 42, 50, 45, 43, 46, 41, 41	5																		
Scores-X—15, 18, 22, 17, 19, 20, 16, 21																							
Scores-Y—40, 42, 50, 45, 43, 46, 41, 41																							
4	50	<p>Find the Spearman’s Rank Coefficient of Correlation for the following bivariate data.</p> <table><tr><td>Series-X</td><td>8</td><td>7</td><td>6</td><td>9</td><td>5</td><td>4</td><td>10</td></tr><tr><td>Series-Y</td><td>10</td><td>10</td><td>11</td><td>14</td><td>9</td><td>9</td><td>12</td></tr></table>	Series-X	8	7	6	9	5	4	10	Series-Y	10	10	11	14	9	9	12	5				
Series-X	8	7	6	9	5	4	10																
Series-Y	10	10	11	14	9	9	12																
4	51	<p>Find out Rank coefficient of correlation between sales and</p>	5																				

		profits of ten firms.			
		Sales	50, 50, 55, 60, 65, 65, 65, 60, 60, 50		
		Profits	11, 13, 14, 16, 16, 15, 15,14, 13, 13		
4	52	Distinguish between parametric and non-parametric tests.			5
3	53	Write a note on data analysis.			5
3	54	What are the steps involved in hypothesis testing?			5
3	55	Distinguish between descriptive statistics an inferential Statistics.			5
3	56	What are the uses of the distribution or t-test.			5
3	57	Write a note on Steps in computing ANOVA.			5
3	58	Write a note on significance of parametric tests.			5
4	59	Write a note on significance of non-parametric tests.			5
4	60	What are the importance of report writing.			5
4	61	What are the objectives of factor analysis?			5
4	62	What are the assumptions of factor analysis?			5
4	63	Briefly discuss the principal component method.			5
4	64	explain the steps of report writing.			5
4	65	Briefly discuss the different types of reports.			5
4	66	Write a note on report writing and its presentation.			5
3	67	Describe the technique of analysis of variance. What are the various steps to carrying out the analysis ?			5
3	68	Define F-test. What are the assumptions on which it is based ?			5
3	69	What are the assumptions of analysis of variance ?			5
3	70	What is meant by the word treatment in ANOVA ?			5
3	71	Describe the technique of ANOVA in two way classification model.			5
3	72	Explain the limitations of hypothesis testing.			5

4	73	Write a note on research ethics.	5
4	74	Briefly discuss the steps of technical report writing.	5
4	75	Briefly discuss the steps of popular report writing.	5
4	76	Evaluate the writing of research report.	5
4	77	Explain bibliography and its importance in context of research report.	5
4	78	Explain the task of interpretation in the context of research methodology.	5
4	79	Explain the limitation of non-parametric test.	5
4	80	Briefly discuss the alternative methods in both parametric and non-parametric test.	5
1	1	Discuss the research problems in different functional areas of economics.	10
1	2	List and explain the steps of research process.	10
1	3	Critically examine the relative importance of different research methods.	10
1	4	Assume a research topic of your choice and give the complete format of its research report.	10
1	5	Explain the relative importance and linkages of objectives, hypotheses testing and policy imperatives.	10
1	6	Explain the sources of information for literature review.	10
2	7	Discuss about case study method and statistical method in conducting research study.	10
2	8	Examine importance of research plan and its preparation before starting research study.	10
2	9	Discuss major categories of documents in research.	10
4	10	How to present a good research report? Discuss.	10
3	11	Discuss regression analysis from the point of view of the analysis of variance.	10

3	12	Discuss the problem of multicollinearity in multiple regression estimation.	10																				
2	13	How is methodology important in research	10																				
1	14	Explain the characteristic of research?	10																				
3	15	What do you mean by probability and non-probability sampling techniques?	10																				
4	16	How does analysis and interpretation are done in research?	10																				
1	17	Explain about different types of social science research.	10																				
2	18	Discuss relative merits of different methods of data collection	10																				
2	19	Write about different methods of sampling	10																				
2	20	Explain briefly the multi-stage stratified sampling method and mention how it is different from simple random sampling method.	10																				
3	21	Explain briefly the importance of time series data analysis	10																				
2	22	Explain the uses of graphical representation of statistical analysis in research.	10																				
3	23	What is hypothesis? What are the characteristics of a good research hypothesis?	10																				
2	24	What is tabulation? Narrate the characteristics of a good table.	10																				
4	25	Explain the importance of footnote reference and bibliography in research.	10																				
3	26	<p>The following table gives the number of units produced per day by two workers A and B for a number of days: Test at 5% level of significance should these results be accepted as evidence that B is the more stable worker.</p> <table><tr><td>A</td><td>40</td><td>30</td><td>38</td><td>41</td><td>38</td><td>35</td><td>-</td><td>-</td></tr><tr><td>B</td><td>39</td><td>38</td><td>41</td><td>33</td><td>32</td><td>49</td><td>49</td><td>34</td></tr></table>	A	40	30	38	41	38	35	-	-	B	39	38	41	33	32	49	49	34	10		
A	40	30	38	41	38	35	-	-															
B	39	38	41	33	32	49	49	34															
3	27	<p>Answer using t-test whether the following two samples drawn from same population at 5% level of significance:</p> <table><tr><td>Sample I</td><td>17</td><td>27</td><td>18</td><td>25</td><td>27</td><td>29</td><td>27</td><td>23</td><td>17</td></tr><tr><td>Sample II</td><td>16</td><td>16</td><td>20</td><td>16</td><td>20</td><td>17</td><td>15</td><td>21</td><td>-</td></tr></table>	Sample I	17	27	18	25	27	29	27	23	17	Sample II	16	16	20	16	20	17	15	21	-	10
Sample I	17	27	18	25	27	29	27	23	17														
Sample II	16	16	20	16	20	17	15	21	-														

3	28	<p>Students were given intensive coaching and 5 tests were conducted in a month. The scores of tests 1 and 5 are given below. Does the scores from test 1 to 5 shown an improvement. Test at 5% level of significance .(critical value -2.101)</p> <table><tr><td>No of Students</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>Marks in 1st test</td><td>60</td><td>41</td><td>70</td><td>55</td><td>62</td><td>38</td></tr><tr><td>Marks in 2nd test</td><td>68</td><td>51</td><td>84</td><td>63</td><td>72</td><td>50</td></tr></table>	No of Students	1	2	3	4	5	6	Marks in 1 st test	60	41	70	55	62	38	Marks in 2 nd test	68	51	84	63	72	50	10			
No of Students	1	2	3	4	5	6																					
Marks in 1 st test	60	41	70	55	62	38																					
Marks in 2 nd test	68	51	84	63	72	50																					
3	29	<p>Ten young recruits were put through a strenuous physical training programme by the army. Their weights (in kg) were recorded before and after with the following results: using 5% level of significance conclude that the programme affects the average weight of young recruits.</p> <table><tr><td>Recruit</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>Weight before</td><td>127</td><td>195</td><td>162</td><td>170</td><td>143</td><td>205</td><td>168</td></tr><tr><td>Weight after</td><td>135</td><td>200</td><td>160</td><td>182</td><td>147</td><td>200</td><td>172</td></tr></table>	Recruit	1	2	3	4	5	6	7	Weight before	127	195	162	170	143	205	168	Weight after	135	200	160	182	147	200	172	10
Recruit	1	2	3	4	5	6	7																				
Weight before	127	195	162	170	143	205	168																				
Weight after	135	200	160	182	147	200	172																				
3	30	<p>Six students were given intensive coaching and tests conducted in a month. The scores of two the tests are given below. Does the score from test 1 to test 2 show an improvement? Use 5% level of significance (table value-2.23)</p> <table><tr><td>No of students</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>Marks in test 1</td><td>50</td><td>42</td><td>51</td><td>26</td><td>35</td><td>42</td></tr><tr><td>Marks in test 2</td><td>62</td><td>40</td><td>61</td><td>35</td><td>30</td><td>52</td></tr></table>	No of students	1	2	3	4	5	6	Marks in test 1	50	42	51	26	35	42	Marks in test 2	62	40	61	35	30	52	10			
No of students	1	2	3	4	5	6																					
Marks in test 1	50	42	51	26	35	42																					
Marks in test 2	62	40	61	35	30	52																					
3	31	<p>Data given in the show the sales of commodity based on three marks strategies. Con you infer the mean sales of all three strategies are equal? Test at 5 Percent level of significance. Table value=4.10</p> <table><tr><td>Quality</td><td>Price</td><td>Convenience</td></tr><tr><td>5</td><td>10</td><td>3</td></tr><tr><td>4</td><td>7</td><td>2</td></tr><tr><td>6</td><td>8</td><td>5</td></tr><tr><td>2</td><td>5</td><td>4</td></tr></table>	Quality	Price	Convenience	5	10	3	4	7	2	6	8	5	2	5	4	10									
Quality	Price	Convenience																									
5	10	3																									
4	7	2																									
6	8	5																									
2	5	4																									
3	32	<p>The marks scrod by ten students in economics are as</p>	10																								

		<p>follows:Can we infer that the variance of the distribution of all the students from the sample of 10 has been taken is equal to 10? Test at 5% and 1% level of significance.</p> <table><tr><td>Sl.No</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr><tr><td>Marks</td><td>38</td><td>40</td><td>45</td><td>53</td><td>47</td><td>43</td><td>55</td><td>48</td><td>52</td><td>49</td></tr></table>	Sl.No	1	2	3	4	5	6	7	8	9	10	Marks	38	40	45	53	47	43	55	48	52	49								
Sl.No	1	2	3	4	5	6	7	8	9	10																						
Marks	38	40	45	53	47	43	55	48	52	49																						
3	33	<p>Two random samples drawn from two normal population are given test using variance at 5% and 1% level of significance whether the two populations have the same variance.</p> <table><tr><td>Sample 1</td><td>20</td><td>16</td><td>26</td><td>27</td><td>23</td><td>22</td><td>18</td><td>24</td><td>25</td><td>19</td><td>-</td><td>-</td></tr><tr><td>Sample 2</td><td>27</td><td>33</td><td>42</td><td>35</td><td>32</td><td>34</td><td>38</td><td>28</td><td>41</td><td>43</td><td>30</td><td>37</td></tr></table>	Sample 1	20	16	26	27	23	22	18	24	25	19	-	-	Sample 2	27	33	42	35	32	34	38	28	41	43	30	37	10			
Sample 1	20	16	26	27	23	22	18	24	25	19	-	-																				
Sample 2	27	33	42	35	32	34	38	28	41	43	30	37																				
3	34	<p>The following table gives the number of units of production per day turned outby four different types of machines.Using the analysis of variance (i) test the hypothesis that the mean productionis the same for the four machines and (i) test the hypothesis that the employeesdo not differ with respect to mean productivity.(Critical Value—)</p> <table><tr><th rowspan="2">Employee</th><th colspan="4">Types of Machines</th></tr><tr><th>M₁</th><th>M₂</th><th>M₃</th><th>M₄</th></tr><tr><td>E₁</td><td>4</td><td>3</td><td>4</td><td>3</td></tr><tr><td>E₂</td><td>3</td><td>4</td><td>5</td><td>4</td></tr><tr><td>E₃</td><td>3</td><td>3</td><td>4</td><td>3</td></tr><tr><td>E₄</td><td>4</td><td>4</td><td>5</td><td>4</td></tr></table>	Employee	Types of Machines				M ₁	M ₂	M ₃	M ₄	E ₁	4	3	4	3	E ₂	3	4	5	4	E ₃	3	3	4	3	E ₄	4	4	5	4	10
Employee	Types of Machines																															
	M ₁	M ₂	M ₃	M ₄																												
E ₁	4	3	4	3																												
E ₂	3	4	5	4																												
E ₃	3	3	4	3																												
E ₄	4	4	5	4																												
3	35	<p>Study the performance of three detergents at three different water temperatures, the following 'whiteness' readings were obtained with specially designed equipment Perform a two-way analysis of variance, using 5% level of significance.</p> <table><tr><th>Water Temperature</th><th>Detergent A</th><th>Detergent B</th><th>Detergent C</th></tr><tr><td>Cold Water</td><td>7</td><td>5</td><td>7</td></tr><tr><td>Warm Water</td><td>9</td><td>2</td><td>8</td></tr><tr><td>Hot Water</td><td>4</td><td>6</td><td>8</td></tr></table>	Water Temperature	Detergent A	Detergent B	Detergent C	Cold Water	7	5	7	Warm Water	9	2	8	Hot Water	4	6	8	10													
Water Temperature	Detergent A	Detergent B	Detergent C																													
Cold Water	7	5	7																													
Warm Water	9	2	8																													
Hot Water	4	6	8																													
3	36	<p>Following is the data on sales by three salesman in three states check whether there is variation in the sales of salesman in these states set ANOVA table for the same (Critical</p>	10																													

		level=5.14) <table><tr><td>States</td><td>A</td><td>B</td><td>C</td></tr><tr><td>1</td><td>5</td><td>4</td><td>4</td></tr><tr><td>2</td><td>7</td><td>8</td><td>5</td></tr><tr><td>3</td><td>9</td><td>6</td><td>6</td></tr></table>	States	A	B	C	1	5	4	4	2	7	8	5	3	9	6	6									
States	A	B	C																								
1	5	4	4																								
2	7	8	5																								
3	9	6	6																								
3	37	<p>Set ANOVA table to the data relating to the yield of wheat per acre and the types of fertilizer applied and find the variance at 5% level of significance. Table value=5.14</p> <table><tr><td>Type of Fertilizer</td><td colspan="3">Variety of whet</td></tr><tr><td></td><td>A</td><td>B</td><td>C</td></tr><tr><td>1</td><td>6</td><td>5</td><td>5</td></tr><tr><td>2</td><td>7</td><td>5</td><td>4</td></tr><tr><td>3</td><td>3</td><td>3</td><td>3</td></tr><tr><td>4</td><td>8</td><td>7</td><td>4</td></tr></table>	Type of Fertilizer	Variety of whet				A	B	C	1	6	5	5	2	7	5	4	3	3	3	3	4	8	7	4	10
Type of Fertilizer	Variety of whet																										
	A	B	C																								
1	6	5	5																								
2	7	5	4																								
3	3	3	3																								
4	8	7	4																								
3	38	<p>Following data show academic background and choice of course of MBA students. Test a hypothesis of whether academic influence choice of course at 5% level of significance.</p> <table><tr><td>Course</td><td>Accounting</td><td>Finance</td><td>Marketing</td></tr><tr><td>BA</td><td>22</td><td>10</td><td>08</td></tr><tr><td>BBA</td><td>10</td><td>18</td><td>25</td></tr><tr><td>BSc</td><td>30</td><td>12</td><td>10</td></tr></table>	Course	Accounting	Finance	Marketing	BA	22	10	08	BBA	10	18	25	BSc	30	12	10	10								
Course	Accounting	Finance	Marketing																								
BA	22	10	08																								
BBA	10	18	25																								
BSc	30	12	10																								
4	39	<p>Use the Wilcoxon sign test at 5% level of significance to test the researchers’ claim that the new feed is effective in increasing the weight for the data given below.(Critical Value- 2)</p> <table><tr><td>Weight before</td><td>1250</td><td>1175</td><td>1400</td><td>1380</td><td>1280</td><td>1510</td></tr><tr><td>Weight after</td><td>1400</td><td>1350</td><td>1390</td><td>1250</td><td>1310</td><td>1450</td></tr></table>	Weight before	1250	1175	1400	1380	1280	1510	Weight after	1400	1350	1390	1250	1310	1450	10										
Weight before	1250	1175	1400	1380	1280	1510																					
Weight after	1400	1350	1390	1250	1310	1450																					
4	40	<p>Use the Wilcoxon sign test at 5% level of significance to test the coaching institute’s claim their coaching helps the SAT score.(Critical Value- 4)</p> <table><tr><td>Score before</td><td>950</td><td>1100</td><td>875</td><td>1200</td><td>1280</td><td>1300</td><td>1410</td></tr></table>	Score before	950	1100	875	1200	1280	1300	1410	10																
Score before	950	1100	875	1200	1280	1300	1410																				

		coaching										
		Score before coaching	1050	1120	900	1190	1300	1310	1390			
4	41	Use the Wilcoxon sign test at 5% level of significance to test the claim that the new diet is effective in reducing weight..(Critical Value- 11)										10
		Weight before diet	180	178	165	200	160	145	170	210	185	155
		Weight after diet	174	181	157	198	152	150	160	205	178	160
4	42	The data below shows the salaries (in 000\$) in randomly selected advertisements in two different occupations. Use the Mann-Whitney test at 1% level of significance to test that the median salary in the fields of education is lower than the median salary in the fields of marketing.										10
		Education (X)	22	40	18	25	15	23	16	19	21	
		Marketing (Y)	28	24	20	45	50	39	26	55	48	
4	43	A group of 15 students is divided into 3 groups: 1,2,3 and each group is afforded a different motivating rationale for excelling in a Maze test. Use Kruskal-Wallis test to determine if there is significant difference between the groups. Use $\alpha=0.05$										10
		Group 1	20.1	26.0	33.7	34.3	37.5					
		Group 2	18.7	19.4	24.4	29.1	37.8					
		Group 3	26.7	38.5	44.1	45.2	50.7					
4	44	Two groups of trainees are given coaching by a two teachers X and Y. at the end of three months coaching period, they were given a test and their scores are as follows. Use Kruskal-Wallis test to determine if there is significant difference in the coaching of two teachers at 5% level of significance.										10
		Teacher X	80	83	79	85	90	68	91			
		Teacher Y	93	65	77	78	88	67	86			
4	45	Find Chi-square from the following information at 5% level of										10

		significance (critical Value-3.84).																										
		<table><tr><td>Condition of Child</td><td>Males</td><td>Females</td><td>Total</td></tr><tr><td>Clean</td><td>70</td><td>50</td><td>120</td></tr><tr><td>Fairly</td><td>80</td><td>20</td><td>100</td></tr><tr><td>Dirty</td><td>35</td><td>45</td><td>80</td></tr><tr><td>Total</td><td>185</td><td>115</td><td>300</td></tr></table>	Condition of Child	Males	Females	Total	Clean	70	50	120	Fairly	80	20	100	Dirty	35	45	80	Total	185	115	300						
Condition of Child	Males	Females	Total																									
Clean	70	50	120																									
Fairly	80	20	100																									
Dirty	35	45	80																									
Total	185	115	300																									
4	46	<p>For a given 150 observations classified by two attributes A and B as follows. Use the Chi-square test whether A and B are associated.</p> <table><tr><td></td><td>A₁</td><td>A₂</td><td>A₃</td><td>Total</td></tr><tr><td>B₁</td><td>40</td><td>25</td><td>15</td><td>80</td></tr><tr><td>B₂</td><td>11</td><td>26</td><td>8</td><td>45</td></tr><tr><td>B₃</td><td>9</td><td>9</td><td>7</td><td>25</td></tr><tr><td>Total</td><td>60</td><td>60</td><td>150</td><td>150</td></tr></table>		A ₁	A ₂	A ₃	Total	B ₁	40	25	15	80	B ₂	11	26	8	45	B ₃	9	9	7	25	Total	60	60	150	150	10
	A ₁	A ₂	A ₃	Total																								
B ₁	40	25	15	80																								
B ₂	11	26	8	45																								
B ₃	9	9	7	25																								
Total	60	60	150	150																								
4	47	<p>An oil company has explored three different areas for possible oil reserves. The results of the test were as given below: do the three areas have the same potential at 5% level of significance:</p> <table><tr><td>Treatment</td><td colspan="3">Area</td><td>Total</td></tr><tr><td></td><td>A</td><td>B</td><td>C</td><td></td></tr><tr><td>Strikes</td><td>7</td><td>10</td><td>8</td><td>25</td></tr><tr><td>Dry Holes</td><td>10</td><td>18</td><td>9</td><td>37</td></tr><tr><td>Total number of test wells</td><td>17</td><td>28</td><td>17</td><td>62</td></tr></table>	Treatment	Area			Total		A	B	C		Strikes	7	10	8	25	Dry Holes	10	18	9	37	Total number of test wells	17	28	17	62	10
Treatment	Area			Total																								
	A	B	C																									
Strikes	7	10	8	25																								
Dry Holes	10	18	9	37																								
Total number of test wells	17	28	17	62																								
4	48	<p>In a college one student are graded according to their I.Q and economic conditions. Use chi square test to find out whether there is any association between tow variable at 5% level of significance. Table value =5.99.</p> <table><tr><td rowspan="2">Economics condition</td><td colspan="3">I Q</td></tr><tr><td>High</td><td>Medium</td><td>Low</td></tr><tr><td>Rich</td><td>160</td><td>300</td><td>140</td></tr><tr><td>Poor</td><td>140</td><td>100</td><td>160</td></tr></table>	Economics condition	I Q			High	Medium	Low	Rich	160	300	140	Poor	140	100	160	10										
Economics condition	I Q																											
	High	Medium	Low																									
Rich	160	300	140																									
Poor	140	100	160																									

4	49	<p>The ranks of 12 persons before and after the training are as follows. Find the Rank Correlation Coefficient:</p> <table><tr><td>Rank Before</td><td>1, 2, 3, 4, 5, 6, 7, 8, 9, 10 ,11, 12</td></tr><tr><td>Rank After</td><td>12, 9, 6, 10, 3, 5, 4, 7, 8, 2 , 11, 1</td></tr></table>	Rank Before	1, 2, 3, 4, 5, 6, 7, 8, 9, 10 ,11, 12	Rank After	12, 9, 6, 10, 3, 5, 4, 7, 8, 2 , 11, 1	10
Rank Before	1, 2, 3, 4, 5, 6, 7, 8, 9, 10 ,11, 12						
Rank After	12, 9, 6, 10, 3, 5, 4, 7, 8, 2 , 11, 1						
4	50	<p>Calculate Spearman's Rank Correlation coefficient between A and RSeries:</p> <table><tr><td>Rank of A</td><td>2.5, 5, 6, 7, 8, 9, 1, 4 , 2.5</td></tr><tr><td>Rank of B</td><td>3,5, 6.5 ,6.5 9, 8, 1 , 4, 2</td></tr></table>	Rank of A	2.5, 5, 6, 7, 8, 9, 1, 4 , 2.5	Rank of B	3,5, 6.5 ,6.5 9, 8, 1 , 4, 2	10
Rank of A	2.5, 5, 6, 7, 8, 9, 1, 4 , 2.5						
Rank of B	3,5, 6.5 ,6.5 9, 8, 1 , 4, 2						
4	51	<p>Calculate Rank Correlation Coefficient from the following data.</p> <table><tr><td>Father's Height</td><td>6, 63,67,64, 69, 62, 70, 66, 68, 67, 69,69 ,71</td></tr><tr><td>Son's Height</td><td>68, 66, 68, 65, 69, 66, 68, 65, 71, 67, 68, 70</td></tr></table>	Father's Height	6, 63,67,64, 69, 62, 70, 66, 68, 67, 69,69 ,71	Son's Height	68, 66, 68, 65, 69, 66, 68, 65, 71, 67, 68, 70	10
Father's Height	6, 63,67,64, 69, 62, 70, 66, 68, 67, 69,69 ,71						
Son's Height	68, 66, 68, 65, 69, 66, 68, 65, 71, 67, 68, 70						
4	52	Evaluate the steps involved in factor analysis	10				
3	53	Evaluate the steps involved in hypothesis testing.	10				
4	54	Briefly explain the steps in report writing.	10				

Q.P Code: 51201

St. Philomena's College (Autonomous) Mysore
III Semester MA Economics - Final Examination : March 2021
Subject : ECONOMICS
Title : RESEARCH METHODOLOGY AND DATA ANALYSIS

Time: 3 Hours

Maximum Marks: 70

PART A

Answer any FIVE of the following:

(5x2=10)

Define Action Research.

Write any two steps involved in research process.

What are the two types of Sampling?

What does editing mean?

Distinguish between qualitative and quantitative variables.

When do we use F-test?

What are factor scores?

Define principle component method.

PART B

Answer any SIX of the following:

(6x5=30)

Explain the objectives of social science research.

Test whether two samples have same variance and belong to one and the universe.

Sample A	N=10	S ² ₁ = 13.3
Sample B	N=12	S ² ₂ = 28.5

Find the critical difference for the data given below of three salesmen X,Y,Z by using this results: (Critical Value—3.98)

Source of Variation	Sum of Square	Degrees of freedom	Mean Square
Between samples	10	2	5
Within samples	30	11	2.75
Total	40	13	

A test was given to 5 students chosen at random from the M.Com. Class of three universities in Madhya Pradesh. Their scores were found as follow between the scores of students in the three universities. Test whether there is any significant difference in the scores at 5% level of significance. (Critical Value—3.44)

	University Scores				
A	90	70	60	50	80
B	70	40	50	40	50
C	60	50	60	70	60

PTO