

Name of Scholar (in CAPITAL):		Printed Pages:																		
Admission No.:		02																		
Core Coursework End Term Examination (Regular Back), May-June 2024 (Till Winter 2022-2023) [Programme: PhD]																				
Course Title: Statistical Methods		Max Marks: 50																		
Course Code: RME703		Time: 3 hrs																		
Instructions:	1. Answer all the questions. 2. Assume missing data suitably (if any).																			
Group A (5 x 2 = 10 Marks)																				
1.	Distinguish correlation and regression. Also point out the properties of regression coefficients.	2																		
2.	Analyze the usefulness of Rank correlation coefficient and inspect whether this coefficient differ with Karl person's correlation coefficient.	2																		
3	Mention the inference would you give if told that the correlation between the number of truck accidents per year and the age of the driver is (-) 0.60.	2																		
4	Identify a postivie correlation senario from economics and expalin why correlation is important in ecomics aspects of business.	2																		
5	Differentiate between partial and multiple correlation analysis.	2																		
GROUP B (4 x 5 = 20 Marks)																				
6	<p>From the analysis of monthly wages paid to employees in two service organizations X and Y, the following results were obtained. You are required to examine (i) which organization pays a larger amount as monthly wages and (ii) which organization is greater variability in individual wages of all the wage earners taken together?</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Organization X</th> <th>Organization Y</th> </tr> </thead> <tbody> <tr> <td>Number of wage earners</td> <td>550</td> <td>650</td> </tr> <tr> <td>Average Monthly Wages</td> <td>5000</td> <td>4500</td> </tr> <tr> <td>Variance of the distribution of wages</td> <td>900</td> <td>1600</td> </tr> </tbody> </table>		Organization X	Organization Y	Number of wage earners	550	650	Average Monthly Wages	5000	4500	Variance of the distribution of wages	900	1600	5						
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7	<p>The following distribution gives the pattern of overtime work done by 100 employees of a company. You are required to examine (i) average overtime work done per employee (ii) Standard Deviation in overtime</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Overtime (hrs)</th> <th>10-15</th> <th>15-20</th> <th>20-25</th> <th>25-30</th> <th>30-35</th> <th>35-40</th> </tr> </thead> <tbody> <tr> <td>No of employees</td> <td>11</td> <td>20</td> <td>35</td> <td>20</td> <td>8</td> <td>6</td> </tr> </tbody> </table>	Overtime (hrs)	10-15	15-20	20-25	25-30	30-35	35-40	No of employees	11	20	35	20	8	6	5				
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8	<p>The score of two batsmen A and B in eight cricket matches during the period 2021- 2022 is given as follows. You are required to examine which of the two batsmen is more consistent in scoring and who is more efficient batsman?</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td>Batsman A</td> <td>10</td> <td>12</td> <td>80</td> <td>70</td> <td>60</td> <td>100</td> <td>0</td> <td>4</td> </tr> <tr> <td>Batsman B</td> <td>18</td> <td>93</td> <td>101</td> <td>5</td> <td>9</td> <td>17</td> <td>32</td> <td>19</td> </tr> </tbody> </table>	Batsman A	10	12	80	70	60	100	0	4	Batsman B	18	93	101	5	9	17	32	19	5
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Batsman B	18	93	101	5	9	17	32	19												
9	<p>Determine the IQR on the following data.</p> <p>44 18 39 40 59 46 59 37 15 73 23 19 90 58 35 82 14 38 27 24 71 25 39 84 70</p>	5																		
GROUP C (2 x 10 = 20 Marks)																				
10	<p>The following table gives indices of industrial production and number of registered unemployed people (in lakh). Calculate the value of the correlation coefficient and conclude the result.</p>																			

Year	Index of Production	Number of unemployed
1991	100	15
1992	102	12
1993	104	13
1994	107	11
1995	105	12
1996	112	12
1997	103	19
1998	99	26

(or)

10

A specialist in hospital administration stated that the number of FTEs (full-time employees) in a hospital can be estimated by counting the number of beds in the hospital (a common measure of hospital size). A healthcare business researcher decided to develop and test this assumption in an attempt to predict the number of FTEs of a hospital by the number of beds. For this, she surveyed 12 hospitals and obtained the following data. The data are presented in sequence, according to the number of beds. Use the following data to construct a model to predict number of Beds in terms of Full Time Employees (FTEs).

Number of Beds	FTEs
23	69
29	95
29	102
35	118
42	126
46	125
50	138
54	178
64	156
66	184

The 2000 U.S. Census also asked for each person's age. Suppose that a sample of 40 households taken from the census data showed the age of the first person recorded on the census form to be as follows.

42 29 31 38 55 27 28 33 49 70 25 21 38 47 63 22 38 52 50 41 19 22 29 48 26 33 42 58 40 32
 24 34 25 52 26 35 81 38 29 31

11 Compute P10, P80, Q1, and Q3, for the available data.

(or)

The Polk Company reported that the average age of a car on U.S. roads in a recent year was 7.5 years. Suppose the distribution of ages of cars on U.S. roads is approximately bell-shaped. If 99.7% of the ages are between 1 year and 14 years, what is the standard deviation of car age? Suppose the standard deviation is 1.7 years and the mean is 7.5 years. Between what two values would 95% of the car ages fall?

10