Name of Scholar (in CAPITAL):	Printed Pages:01
Admission No.:	

Core Coursework End Term Examination (Regular/ ~~Back~~), May-June 2024

(For Winter 2023-2024)

[Programme: PhD]

Course Title: Statistics and Computer Applications	Max Marks: 100
Course Code: C1RC101T	Time: 3 hrs

Instructions:	1. Answer as per the instructions in each section. 2. Assume missing data suitably (if any).

Section A: All questions are compulsory.

(5 x 5 = 25 Marks)

		Marks
1	Define the terms: (i) Random Experiment, (ii) Mutually Exclusive Events and (iii) Conditional Probability.	5
2	What is a time series data? Discuss briefly various time series patterns.	5
3	Explain the terms: (i) Significance Level and (ii) Confidence Level.	5
4	Differentiate between "probability density plot" and "cumulative probability plot." What is the use of "randtool" in MATLAB.	5
5	What is the function of the following MATLAB commands: (i) who, (ii) clc, (iii) clear all, (iv) plot, and (v) hold.	5

Section B: Answer any five questions.

(15 x 5 = 75 Marks)

6	(i) Explain the following terms related to correlation. [5 Marks]
	   (a) Autocorrelation.
	   (b) Product moment correlation coefficient.
	 (ii) What do you understand by parametric and non-parametric probability distributions? Differentiate between discrete and continuous random variables. [10 Marks]
		15

7	Define the following statistical terms: (i) Mean, (ii) Median, (iii) Mode, (iv) Standard deviation, and (v) Variance	15
8	State four classical assumptions in MLR. Discuss the process of calculating model parameters of a MLR model.	15
9	(i) Discuss the significance of the following plots. [6 Marks] (a) Scatter plot, (ii) Probability plot, and (iii) Time series plot. (ii) A discrete random variable "X" has the following values and their corresponding probabilities. <table><tr><td>Value</td><td>2</td><td>3</td><td>4.5</td><td>6</td></tr><tr><td>Probability</td><td>0.15</td><td>0.25</td><td>0.45</td><td>0.15</td></tr></table> Draw the probability plot and cumulative probability plot of "X." [9 Marks]	15
10	What is "Hypothesis Testing?" Discuss various parametric tests used for hypothesis testing. List out the steps for "Hypothesis Testing."	15
11	Test the claim that true mean diameter of a manufactured bolt is 30 mm. Given data: $\alpha = 0.05$, n = 100, sample mean = 29.84, $\sigma = 0.8$. Given that $z_{crit}(0.025) = 1.96$.	15