



VIT

Vellore Institute of Technology
(Deemed to be University under section 3 of UIR, Act, 1986)

**SCHOOL OF ADVANCED SCIENCES
CONTINUOUS ASSESSMENT TEST - II
WINTER SEMESTER 2024-2025**

REG.NO.:

SLOT:E1+TE1

Programme Name & Branch : MIS- M.Tech. (Integrated) SOFTWARE ENGINEERING
Course Code and Course Name : IMAT202L - PROBABILITY AND STATISTICS
Faculty Name(s) : Common slot (E1+TE1 slot all faculty)
Class Number(s) : Common slot
Date of Examination : 20/03/2025, Session 2 (14.00 PM - 15.30PM)
Exam Duration : 90 minutes **Maximum Marks: 50**

General instruction(s):

- Answer All Questions
 - Statistical tables are permitted.
 - M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- Course Outcomes CO2: Understand the basic concepts of random variables and find an appropriate distribution for analyzing data specific to an experiment.
CO3: Apply statistical methods like correlation, regression analysis in analyzing, interpreting experimental data.
CO4: Make appropriate decisions using statistical inference that is the central to experimental research.

Q. No	Question	M	CO	BL																						
1.	Calculate the rank correlation coefficient for the following 10 observations of X and Y, using the corrections for the tied ranks. <table><tr><td>X</td><td>63</td><td>59</td><td>70</td><td>45</td><td>59</td><td>75</td><td>70</td><td>35</td><td>50</td><td>59</td></tr><tr><td>Y</td><td>57</td><td>53</td><td>63</td><td>40</td><td>76</td><td>55</td><td>63</td><td>43</td><td>45</td><td>65</td></tr></table>	X	63	59	70	45	59	75	70	35	50	59	Y	57	53	63	40	76	55	63	43	45	65	10	3	2
X	63	59	70	45	59	75	70	35	50	59																
Y	57	53	63	40	76	55	63	43	45	65																
2.	Find the equations of the regression lines from the following data. Hence find the coefficient of correlation between X and Y. <table><tr><td>X</td><td>62</td><td>64</td><td>65</td><td>69</td><td>70</td><td>71</td><td>72</td><td>74</td></tr><tr><td>Y</td><td>126</td><td>125</td><td>139</td><td>145</td><td>165</td><td>152</td><td>180</td><td>208</td></tr></table>	X	62	64	65	69	70	71	72	74	Y	126	125	139	145	165	152	180	208	10	3	2				
X	62	64	65	69	70	71	72	74																		
Y	126	125	139	145	165	152	180	208																		
3.	The probability of a carnation producing a pink flower is 0.35. a) Find the mean and variance of the number of pink flowers produced in 20 carnation blooms. b) Find the probability that in 20 carnations that are about to produce flowers, having (i) at least 2 pink flowers. (ii) no more than 5 pink flowers. (iii) between 3 and 7 pink flowers, inclusive on both ends.	10	2	2																						
4.	The time taken by a team to complete the assembly of an electrical component is found to be normally distributed, about a mean of 110 minutes, and with a standard deviation of 10 minutes.	10	2	2																						



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	(a) Out of a group of 20 teams, how many will complete the assembly: (i) within 95 minutes. (ii) in more than 2 hours. (b) If the management decides to set a 'cut off' time such that 95% of the teams will have completed the assembly on time, what time limit should be set?			
5.	In a random sample of 100 persons from town A, 60 are found to be high consumers of wheat. In another sample of 80 persons from town B, 40 are found to be high consumers of wheat. Do these data reveal a significant difference between the proportions of high wheat consumers in town A and town B (at $\alpha = 0.05$)?	10	4	3
