



VIT

Vellore Institute of Technology
Established in the year 1984 and became a U.P. in 1989

REG.NO.:

**SCHOOL OF ADVANCED SCIENCES
CONTINUOUS ASSESSMENT TEST - I
WINTER SEMESTER 2025-2026**

SLOT: G1 + TG1

Programme Name & Branch : B. Tech
Course Code and Course Name : BMAT 202L, Probability and Statistics
Faculty Name(s) : Common Question Paper
Class Number(s) : Common Question Paper
Date of Examination : 02-02-2026
Exam Duration : 90 minutes **Maximum Marks: 50**

General instruction(s):

- Answer All Questions
- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- Course Outcomes:
 - CO1- Compute and interpret descriptive statistics using numerical and graphical techniques.
 - CO2- Understand the basic concept of random variable 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.

Q. No	Question	M	CO	BL																		
1.	<p>If the median and mode of the following wage distribution are known to be Rs. 35 and 36 respectively. Three frequencies values from the table are unknown. Find these missing frequencies, if given that total frequency is 240:</p> <table border="1" style="margin-left: 20px;"> <tr> <td>Daily Wages</td> <td>0-10</td> <td>10-20</td> <td>20-30</td> <td>30-40</td> <td>40-50</td> <td>50-60</td> <td>60-70</td> </tr> <tr> <td>Frequencies</td> <td>12</td> <td>18</td> <td>x</td> <td>y</td> <td>z</td> <td>10</td> <td>8</td> </tr> </table>	Daily Wages	0-10	10-20	20-30	30-40	40-50	50-60	60-70	Frequencies	12	18	x	y	z	10	8	10	1	2		
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2.	<p>The following table shows the daily closing prices of shares of Company A and Company B over eight days. Find out which company's share price is more stable. Comment on the result.</p> <table border="1" style="margin-left: 20px;"> <tr> <td>Share A</td> <td>42</td> <td>45</td> <td>44</td> <td>43</td> <td>46</td> <td>41</td> <td>47</td> <td>44</td> </tr> <tr> <td>Share B</td> <td>68</td> <td>66</td> <td>67</td> <td>69</td> <td>65</td> <td>70</td> <td>68</td> <td>67</td> </tr> </table>	Share A	42	45	44	43	46	41	47	44	Share B	68	66	67	69	65	70	68	67	10	1	3
Share A	42	45	44	43	46	41	47	44														
Share B	68	66	67	69	65	70	68	67														
3.	<p>The diameter, say X, of an electric cable is assumed to be a continuous random variable with p.d.f $f(x) = 6x(1-x)$, $0 \leq x \leq 1$.</p> <p>(i) Obtain an expression for c.d.f. of X.</p> <p>(ii) Compute $P\left(X \leq \frac{1}{2} \mid \frac{1}{3} \leq X \leq \frac{1}{2}\right)$</p> <p>(iii) Find $E(X)$ and $\text{Var}(X)$.</p>	10	2	3																		



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4.	<p>A two dimensional random variable (X, Y) have a joint probability distribution given by:</p> $P(X = x, Y = y) = k(x^2 + y + 1), \quad x = 0, 1, 2, 3 \text{ and } y = 0, 1, 2.$ <p>(i) Find the value of k. (ii) Find the marginal distributions of X and Y. (iii) Find the conditional distribution of Y given $X = 2$. (iv) Find $P(X \leq 2, Y \geq 1)$</p>	10	2	3																											
5.	<p>Find the Spearman's rank correlation <u>coefficient</u> between sales and expenses of the 8 firms from the following data:</p> <table border="1"> <thead> <tr> <th>Firm No.</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> </tr> </thead> <tbody> <tr> <td>Sales(in lakhs)</td> <td>50</td> <td>55</td> <td>56</td> <td>60</td> <td>62</td> <td>64</td> <td>66</td> <td>68</td> </tr> <tr> <td>Expenses(in lakhs)</td> <td>12</td> <td>14</td> <td>15</td> <td>15</td> <td>12</td> <td>13</td> <td>15</td> <td>16</td> </tr> </tbody> </table>	Firm No.	1	2	3	4	5	6	7	8	Sales(in lakhs)	50	55	56	60	62	64	66	68	Expenses(in lakhs)	12	14	15	15	12	13	15	16	10	3	2
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